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Puerto Rico Healthcare Workforce Study

Commissioned by:

EXPERTS WITH IMPACT™

FTI CONSULTING

Robert Mujica
Executive Director
Financial Oversight & Management Board for Puerto Rico
San Juan, Puerto Rico

Dear Mr. Mujica,

On behalf of FTI Consulting, Inc. (FTI) and its strategic partner Impactivo, it is my pleasure to deliver this report which memorializes our comprehensive study of Puerto Rico's healthcare workforce. This study was comprised of three interrelated workstreams – creation of a healthcare workforce profile, development of a healthcare workforce demand-supply model, and extensive qualitative (key informant interviews) and quantitative (healthcare workforce survey) stakeholder engagement and input solicitation.

We are confident that the study's findings and our team's recommendations will further the goal of addressing critical workforce supply-demand misalignments across the territory's healthcare system. Moreover, we believe the findings and recommendations can inform policy directed at restoring growth and prosperity in Puerto Rico – as noted in the Update on Economic Development presentation in the most recent FOMB public meeting, both **workforce** and **healthcare** are **long-term enablers of Puerto Rico's economic growth**.

We look forward to extending our collaboration with the Financial Oversight & Management Board for Puerto Rico as it considers the study's findings and recommendations and shares them with key stakeholders in the territory – FTI and Impactivo are committed to helping Puerto Rico achieve its economic potential and become a better place for people to work, live and grow.

With warmest regards,

Juan M. Montañez
Senior Managing Director
FTI Consulting, Inc.

EXECUTIVE SUMMARY

RATIONALE

The Financial Oversight & Management Board for Puerto Rico (the "Oversight Board" or "FOMB") in collaboration with the Puerto Rico Department of Health ("DOH") and the Fiscal Agency and Financial Advisory Authority ("AAFAF," for its Spanish Acronym) engaged **FTI Consulting ("FTI")** to conduct a healthcare workforce study. This study was commissioned with the recognition that addressing Puerto Rico's healthcare workforce challenges is critical to improving the health and quality of life of Puerto Rico's residents as well as driving economic growth. FTI partnered with **IMPACTIVO** to conduct this study.

The study was designed to:

- Quantify and forecast healthcare workforce demand and supply, and in the process identify the most significant projected imbalances between workforce demand and supply,
- Ascertain the drivers of the workforce demand-supply imbalance, and
- Through research and analysis supported by extensive stakeholder engagement, formulate and prioritize recommendations for resolving demand-supply imbalances.

The results of this study were expected to inform the FOMB on the best strategies for addressing the most acute healthcare workforce shortages in Puerto Rico.

APPROACH

To complete the study, FTI conducted a series of interrelated activities that resulted in the creation of two quantitative analysis assets:

- The **healthcare workforce demand-supply model** was built on a data management platform that enabled benchmarking and advanced analytical and modeling techniques. FTI has employed this platform on numerous population health need and workforce assessment projects. Workforce demand inferences are derived by first establishing the demand for healthcare *services*. This enables FTI to dynamically model the impact of changes in demand for certain services on workforce needs by category, geography, demographic group and – as needed – by program. This method, which explicitly links projected service needs with workforce demand, provides a more informative, defensible, and data-driven workforce projection.

- The **healthcare workforce profile** is a multi-dimensional database that captures key attributes of the workforce including category (e.g. type of institution, physician specialty), subcategory (e.g. physician subspecialty), what population it serves (what manage care organization contracts it has), and location. Like the model, the profile enables projecting changes in workforce availability time.

In addition to the creation of these quantitative analysis assets, FTI solicited and analyzed critical input from healthcare stakeholders in Puerto Rico. To that end, FTI and IMPACTIVO utilized two complementary modalities of information collection to gather critical stakeholder insights related to Puerto Rico's healthcare workforce:

- **Key informant interviews** (individual and group) - recognizing the value of securing engagement and buy-in from key stakeholders, FTI and Impactivo allocated resources to conduct one-on-one or group interviews with key public sector and private sector stakeholders. A total of 21 stakeholder groups were identified for interviews and specific individuals representing the experiences of those stakeholder groups were invited to participate in a group interview. A total of 60 individuals participated in the data collection process.

- **Surveys** – The FTI team built and conducted online surveys designed for different survey cohorts: physicians and other healthcare practitioners with doctorate degrees, nurses, allied health professionals, medical students and residents, and health care administrators. The survey was delivered through multiple channels and designed to be both culturally sensitive and compatible with different devices (laptops, smartphones, tablets), thus ensuring high participation rates.

A critical element of the study was an assessment of the capability and capacity of organizations that train and educate healthcare professionals in Puerto Rico, including medical schools and medical residency and fellowship programs. This assessment was essential to understanding the root causes of challenges and bottlenecks in Puerto Rico's healthcare education and training infrastructure.

A fundamental premise of our study is that a true measure of workforce **supply** – specifically the supply of **healthcare professionals** - requires accounting for **raw counts** of these professionals, their **availability** (hours of operation), their **operational capacity** (productivity/ throughput), and their **accessibility** (can clients access services from the professional in a timely manner and the most appropriate care setting). Thus, in our study we assessed availability, operational capacity and accessibility qualitatively and we assessed raw counts quantitatively.

MAJOR FINDINGS

Inferences from the combined analysis of findings from the model, survey and interviews – some of these inferences may require further validation, for which we provide applicable recommendations in this report.

1. Our modeling suggests there is significant misalignment between demand and supply across multiple healthcare workforce categories. We define misalignment as supply significantly exceeding demand or, conversely, demand significantly exceeding supply. Our modeling also suggests that the magnitude of the misalignment varies based on:
    - Patient demographic factors – all else being equal, older Puerto Ricans have greater difficulty accessing services than younger Puerto Ricans.
    - Geography – Puerto Ricans living in more rural regions – less densely populated and farther from Puerto Rican's larger population centers – have greater difficulty accessing services than Puerto Ricans who live in those population centers.
    - Category of service – there are certain workforce professional types for which the misalignment is greatest, including but not limited to endocrinology, gastroenterology, geriatrics, nephrology, oncology, orthopedics, physical therapy, psychology/psychiatry and urology geriatrics, orthopedics and urology. There is also a critical gap in clinical support staff, such as physical therapists, essential to the management of an elderly population and patients with multiple chronic diseases.

2. The high geographic concentration of certain healthcare practitioners in more urban parts of Puerto Rico creates significant accessibility issues particularly in the more rural parts of Puerto Rico.

3. We identified significant deficiencies in certain healthcare practitioners that is exacerbated by a large percentage of practitioners being age 65 and above.

4. We received numerous comments about deficiencies in healthcare workforce sectors focused on *administrative supports* - this includes multiple types of healthcare professionals.
    - Examples: medical record coders, revenue cycle management/billing agents, health informaticists/ statisticians/analysts, information system administrators

5. We received numerous comments about deficiencies in workforce sectors that, while not traditionally categorized as *healthcare* workforce sectors, impact timely access to services and, as a result, put pressure on the existing healthcare workforce in a variety of ways.
    - Examples: front-desk, security, janitorial, transportation, dependent care (children, disabled non-elderly adults, elderly)

6. There are laws and regulations in effect in Puerto Rico which constrain and/or act as barriers to adding to/developing the healthcare workforce.
    - Examples: practitioners operating outside of Puerto Rico not able to offer telehealth services to patients in Puerto Rico; limits on the use and scope of practice of physician extenders such as nurse practitioners and physician assistants

7. There are administrative inefficiencies which constrain and/or act as barriers to adding to/developing the healthcare workforce
    - Examples: healthcare practitioner licensing and credentialing which are heavily reliant on archaic paper-based processes and can take months, or in some cases over a year, in addition to fragmentation and duplication of effort from having to work with multiple payers independently to secure individual credentials

8. We received numerous comments about care management and delivery inefficiencies that, in conjunction with siloed services, lead to overutilization of certain constrained resources and avoidable utilization of certain services when patient needs and problems are not managed timely or effectively
    - Examples: post-discharge physical therapy and rehabilitation protocols, lack of coverage or inadequacy in long term-care services and supports/home and community based supports and downstream impacts, and disproportionate numbers of referrals for certain services vis-à-vis the U.S. experience partly because of very limited adoption of coordinated care models.

9. There is documented suboptimal access to and use of clinical, administrative and analytic information systems and related resources and data; this results in everything from multiple orders of the same test or diagnostic procedure, extended time with patients who have to retell the same stories about their condition, risks associated with prescribing medications that may have interactions or cause patient reactions where information about existing prescriptions was not available, and general operational inefficiency – many more healthcare practitioners in Puerto Rico remain on paper-based systems for operations and recordkeeping.

10. We received numerous comments about what appear to be unintended consequences of certain (well-intentioned) policy initiatives; examples of these apparent unintended consequences include:
    - The much-publicized 4 percent tax incentive for certain healthcare practitioners appears to have had the effect of driving recipients of the incentive to reduce hours of operation while still maintaining the same level of net income, and
    - The increase in Government Health Plan (GHP) reimbursement for certain providers driving practitioners to prioritize GHP members over members of other health coverage programs.

    While we were not able to scientifically corroborate these assertions, because a large enough number of key informants from across the healthcare industry raised these concerns we believe they merit an in-depth investigation. Moreover, the misalignment between workforce demand and supply identified in our study warrants a reassessment of the effectiveness of these policies.

11. We received numerous comments expressing concern about the quality of some non-accredited healthcare education programs and the manifestation of this in care management and delivery; for instance, delayed care resulting from general medicine practitioners excessively referring patients to specialty care practitioners, or the risk of not knowing when to refer certain patients to specialty care practitioners. A similar case was noted for nurses who received limited simulation training. Informants cited the need to provide additional training to these general physicians and nurses to integrate them to care teams and retain them. In addition to increasing costs for health facilities, this also creates an added strain on the workforce, as healthcare professionals must work harder to make up for these gaps in training.

12. Funding constraints and/or misalignment – the disparities in Medicaid and Medicare federal funding between Puerto Rico and U.S. states jurisdictions are well-documented and noted as a major driver of workforce shortages and, perhaps more fundamentally, the unavailability of critical health and human services in the territory. We received numerous comments about this well-documented issue, and we note this in our report. The above noted, given the limitations of our study we could not conduct an in-depth assessment of the direct impact of potential funding increases on Puerto Rico's healthcare workforce, the adequacy of existing funding or the effectiveness with which existing funding is being used. Moreover, we found that organizations in Puerto Rico – government agencies and private sector entities – were not benefiting from several federal funding opportunities directly tied to healthcare workforce development. Most of those opportunities required submission of applications or (in the case of competitive programs) proposals. It is unclear whether the organizations that could have pursued these funds have early awareness of the opportunities or the internal capacity and knowhow to submit compliant, compelling applications/ proposals in a timely manner.

13. Our model suggests that the gap between healthcare workforce demand and supply will continue to increase even after accounting for potential investments in workforce development. The rise in chronic illness in Puerto Rico is unsustainable, as patients arrive at hospitals and specialists in worse health, contributing to an overburdened healthcare system. The inability to access timely care leads to higher morbidity rates, overwhelming the system and increasing pressure on healthcare providers who are already stretched thin. This finding points to the need to pursue initiatives designed to improve population health in conjunction with initiatives designed to close demand-supply gaps.

RECOMMENDATIONS

In this report, the FTI team provides numerous actionable recommendations based on input from stakeholders interviewed and surveyed in combination with the FTI team's experience (refer to Section 7 of this report). These recommendations are designed to address issues with:

- **Workforce demand** – initiatives that have been demonstrated to, at relatively low cost and in relatively short order, improve population health and drive towards more optimal utilization of certain healthcare professionals and support resources.

- **Workforce supply** – with the goals of increasing the number, availability, capacity and accessibility of healthcare professionals that our modeling suggests will be in most demand, and improving the retention of these professionals.

- **Workforce information and information management (IM) processes and systems** – with the goal of ensuring that complete, accurate and accessible current and historical workforce information is collected to facilitate continuous refresh of study artifacts, monitoring and evaluation of the impact of initiatives pursued to address workforce supply and demand, and comprehensive healthcare industry analysis.

Table of Contents

1. Purpose

OVERVIEW

In June of 2023 the Financial Oversight & Management Board for Puerto Rico (the "Oversight Board" or "FOMB"), in collaboration with the Puerto Rico Department of Health ("DOH") and the Fiscal Agency and Financial Advisory Authority ("AAFAF," for its Spanish Acronym), published a Request for Proposal (RFP) looking for Survey Administration organization to conduct a **comprehensive study of Puerto Rico's healthcare workforce.** This study was commissioned with the recognition that addressing Puerto Rico's healthcare workforce challenges is critical to improving the health and quality of life of Puerto Rico's residents as well as driving economic growth.

In March of 2024 the FOMB engaged FTI Consulting ("FTI") to conduct the study in partnership with Impactivo LLC, a Puerto Rico based consulting firm that specializes in addressing critical healthcare challenges including population health, quality, organizational development, and sustainability.

The study was designed to:

- Quantify and forecast healthcare workforce demand and supply, and in the process identify the most significant projected imbalances between workforce demand and supply,
- Ascertain the drivers of the workforce demand-supply imbalance, and
- Through research and analysis supported by extensive stakeholder engagement, formulate and prioritize recommendations for resolving demand-supply imbalances.

This study was driven largely by the state of Puerto Rico's healthcare system and the demographic dynamics that are putting significant pressure on the system; for instance:

- Over 47 percent of Puerto Rico's physicians in active practice are 60 years of age or older, more than every U.S. state and territory analyzed by the Association of American Medical Colleges (AAMC).[1]

- The ratio of Graduate Medical Education (GME) residents and fellows in Undergraduate Medical Education (UME) Students - the GME-UME ratio - in Puerto Rico is 0.4, the lowest among all U.S. states and territories.[2]

- Regarding physician retention, AAMC has reported that only half of the physicians who graduated from medical schools in Puerto Rico were in active practice in Puerto Rico.[3] No other U.S. jurisdiction is experiencing such a loss of medical professional talent.

In response to this reality, our study was designed to address the following:

- The shortage in health care professionals is apparent to everyone in Puerto Rico, but to date much of this shortage's evidence has been anecdotal.
- It is critical to understand future demand for health care workforce based on Puerto Rico's demographics, disease/condition prevalence, social risk factors and other drivers in order to base investments in workforce on projected needs, not conjecture or outdated facts.
- It is also critical to understand the drivers of declines in healthcare workforce, particularly within workforce sectors for which demand is expected to increase.

[1] Table 1.9, AAMC "2021 State Physician Workforce Data Report"
[2] Table 3.4, Idem
[3] Table 4.1, Idem

BACKGROUND

In recent years news outlets both nationally and locally in Puerto Rico have reported on the "crisis" facing Puerto Rico's healthcare system. This "crisis" has been attributed to the exodus of healthcare professionals, increase in the prevalence of chronic diseases due to an elderly population, and the increase in the island's mortality rate. For instance, an investigative story jointly published by The Washington Post and Puerto Rico's Center for Investigative Journalism[4] starkly illustrates the deadly consequences of a failing health care system. The story noted that the collapsing healthcare system had left large swaths of Puerto Rico with scant medical infrastructure and personnel. The report stated that:

- The number of physicians in Puerto Rico had decreased by almost fifty percent,
- Fewer than a third of Puerto Rico's municipalities had functioning hospitals with accessible beds, and
- Some Puerto Ricans live as far as 20 miles away from the nearest hospital, which can translate to over an hour in traffic given Puerto Rico's topography and transportation network.

Stories of the impact to Puerto Rico's residents of the lack of healthcare access are constantly in the news, including the impact of large hospital systems going into bankruptcy and the closing of critical residency programs such as neurosurgery. That noted, clarity is lacking on what is driving the growing perceived gap between workforce supply and workforce demand, in addition to what is driving perceived reductions in workforce supply. For instance, there is insufficient information on how many graduates from health care programs – including medical residents – stay in Puerto Rico or return to Puerto Rico after completing their preparation.

All the above noted, the healthcare workforce challenge is not unique to Puerto Rico. According to a recent study published by Mercer[5], a nationwide shortage of 100,000 healthcare workers is anticipated by 2028, with some states facing projected surpluses or severe deficits between future supply and demand. If current U.S. workforce trends continue, the healthcare workforce is projected to reach 18.6 million by 2028, an increase of over 1.5 million from 2023. However, with demand expected to rise to 18.7 million, this still leaves a shortfall of more than 100,000 workers within five years. These workforce pressures in the U.S. could very well exacerbate the workforce pressures in Puerto Rico, as U.S.-based healthcare organizations may continue to look to Puerto Rico as a source of talent especially given the growth in the U.S. Hispanic population.

STUDY SCOPE AND DELIVERABLES

This **Healthcare Workforce Study** extends beyond the design and execution of a survey. We recognize the importance of engaging stakeholders from across the healthcare system to gain an in-depth understanding of workforce drivers – an understanding which needs to be as objective and data-driven as possible. We also recognize, particularly in the Puerto Rico context, the criticality of engaging stakeholders to discuss and build buy-in on any recommendations for addressing workforce shortages. Ultimately, strategies for resolving healthcare workforce deficits will require consensus and buy-in from multiple constituencies so they can be implemented over multiple years. All of the above noted, we strongly believe that building a model that enables the credible projection of population health needs - based on demographics, prevalence of certain health conditions, claims utilization data, and other relevant factors – and establishing a solid baseline of healthcare workforce capacity are essential to determining healthcare workforce needs and developing the right solutions for resolving workforce challenges. As such, our proposed approach to addressing the FOMB's ask incorporates a **survey** in addition to the construction of a **healthcare workforce profile** and a **workforce demand-supply model**.

[4] https://www.washingtonpost.com/nation/interactive/2023/puerto-rico-deaths/

[5] https://www.beckershospitalreview.com/workforce/healthcare-faces-deficit-of-100-000-workers-by-2028.html?origin=BHRE&utm_source=BHRE&utm_medium=email&utm_content=newsletter&oly_enc_id=6243B1782301D8Z

The **deliverables** produced as part of the study include:

1. The **Workforce Profile,** a multi-dimensional database that captures key attributes of the workforce including category (e.g. type of institution, physician specialty), subcategory (e.g. physician subspecialty), what population it serves (what manage care organization contracts it has), and location. Like the model, the profile can be an asset that can serve multiple purposes once it is built. Moreover, the profile enables projecting changes in workforce availability and capacity over time. Finally and perhaps most importantly, the profile facilitates a discussion of workforce availability and capacity that is grounded on facts.

2. **Documentation of Stakeholder Engagement: Key Informant Interviews and Workforce Survey.** A key deliverable is a detailed report of the approach used to design and conduct the survey and interviews, the final set of survey and interview instruments, a matrix that captures information on survey respondents and interviewees, and the details of key results/findings/observations that informed FTI's recommendations for addressing workforce issues.

3. The **Workforce Demand-Supply Model ("Model")**, a platform that supports benchmarking and advanced analytical and modeling techniques. The platform enabled us to dynamically model the impact of changes in demand for certain services on workforce needs by category, geography, demographic group and – as needed – by program. We believe this is the only method for forecasting workforce demand – by building these projections on a defensible, data-driven foundation. Moreover, the model can be employed to address other healthcare questions such as how best to utilize certain funds to drive utilization or promote the availability of certain services. Finally, the model enables "benchmarking" –assumptions can be built about service demand and associated workforce needs based on the experience of other jurisdictions that may have successfully addressed certain workforce deficits.

4. **Recommendations.** This report will include a description of the approach used to formulate, profile, solicit input on and evaluate recommendations for addressing workforce deficits identified through our demand modeling and surveying activities, followed by a detailing and discussion of recommendations including the cost-benefit analysis employed to prioritize recommendations. This report will also include a proposed prioritization and sequencing of recommendations. Finally, this report will also include FTI's perspective on how best to message these recommendations to different stakeholders including but not limited to federal and local government agencies, provider associations, institutions of higher learning and potential non-governmental funders.

Exhibit 1A (next page) details how we utilized the model, profile, and survey (for purposes of the exhibit, "survey" includes all forms of stakeholder engagement) to meet the requirements of the workforce study.

EXHIBIT 1A. HEALTHCARE WORKFORCE STUDY OVERVIEW, INCLUDING RELATIONSHIPS ACROSS STUDY WORKSTREAMS/COMPONENTS

		STUDY REQUIREMENTS				
		Project demand for different workforce categories and subcategories based on forecasted healthcare service demand/consumption	Establish current state of healthcare workforce and project future-state workforce capacity	Ascertain workforce supply-demand imbalance	Ascertain workforce supply drivers	Formulate, profile, vet and prioritize recommendations for resolving healthcare workforce shortages
STUDY COMPONENT	Workforce Demand Model	The Model will be used to project workforce needs by category of service (adjusted for geography and, as needed, healthcare program) by first establishing projections for healthcare *services* demand		Use Model outputs, in conjunction with Profile outputs, to establish supply gaps by workforce category, subcategory, geographic region and (if applicable) program	The Survey will be used to establish root causes of workforce supply deficits	The Survey will be used to both generate and "test-market" strategies that could be employed to address root causes of workforce supply deficits
	Workforce Profile		The Profile will be based on available, credible data sources reconciled as needed to establish a workforce baseline and trends	Use Profile outputs, informed by key findings from the Survey, in conjunction with Model outputs to establish supply gaps by workforce category, subcategory, geographic region and (if applicable) program		
	Workforce Survey		Certain Survey findings will inform future-state workforce capacity projections		The Survey will be used to establish root causes of workforce supply deficits	The Survey will be used to both generate and "test-market" strategies that could be employed to address root causes of workforce supply deficits

2. Methodology and Deliverables

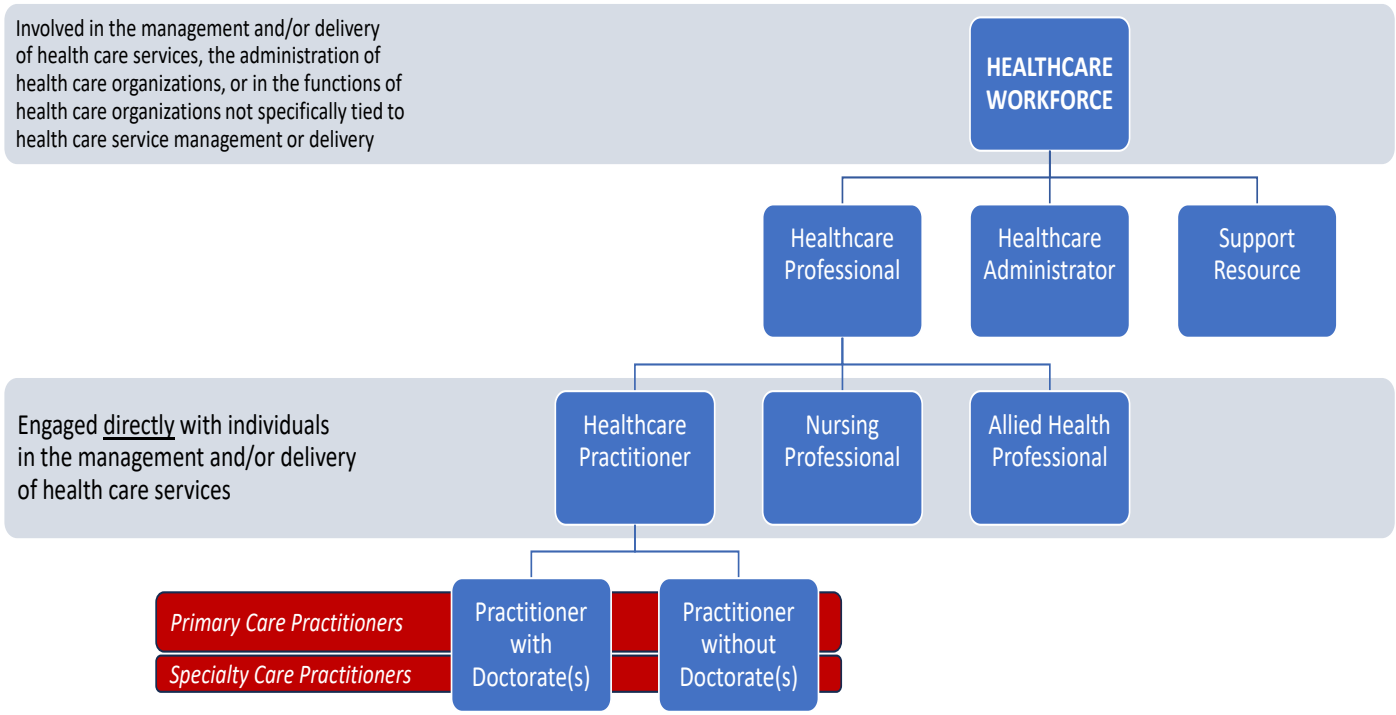
OVERVIEW

The methodology employed to conduct this study, and the deliverables built to complete the study, were designed to meet the FOMB's requirements for the study:

- Intensive data gathering and curation,
- A dynamic model that supports data-driven inferences of healthcare service demand and its implications on workforce requirements, and
- Stakeholder engagement through which we would collect critical qualitative inputs that will enable analysis of healthcare workforce supply drivers and recommendations for how best to resolve workforce supply deficits.

In order to frame the study and provide direction to the various study workstreams, we first established a definition of **healthcare workforce** and agreed on a generally acceptable **workforce taxonomy**. The definitions and taxonomy are detailed in Exhibit 2A, below. In particular, the definitions and taxonomy were employed in constructing the workforce demand-supply model, organizing the key stakeholder interviews, structuring and building the various cohorts within the healthcare workforce survey, and in building and utilizing a consistent lexicon for describing the healthcare workforce "universe". The taxonomy and lexicon were particularly important to facilitate discussions with stakeholders, obtain input from stakeholders that could be interpreted consistently, and define survey questions that would be understood and responded to consistently.

EXHIBIT 2A. HEALTHCARE WORKFORCE DEFINITION AND TAXONOMY



Within this taxonomy:

- A **healthcare professional** is differentiated from an **administrator** in that an administrator focuses on the operations of the organization in which the professional provides or manages healthcare services. We did identify multiple instances in which an administrator was also a professional, e.g. a physician who was the head of a medical practice but also saw patients and delivered care within that practice.
- A **healthcare support resource** performs functions which are required for the effective, efficient operation of a healthcare organization but, in performing those functions, the resource is not directly engaged in the management or delivery of healthcare services. There are multiple examples of these types of resources, including:
    - Resources that are more "patient-facing", such as a medical practice scheduler or a hospital registration clerk.
    - Resources that are not necessarily "patient-facing", but provide necessary supports within a healthcare organization, such as coders, billing agents, information system managers and support personnel, and even janitorial and security personnel without which the organization might not be able to open for business.
- **Allied health professionals** are support staff that are critical to the management and delivery of patient care; they include but are not limited to physical therapists, speech and hearing therapists, respiratory therapists, lab and pharmacy technicians, and paramedics.
- **Healthcare practitioners** can be categorized based on their educational profile but also based on the focus of services they provide. In keeping with global classification systems for healthcare practitioners, we group them into subcategories based on the highest degree attained and whether they provide primary care or specialty care:
    - **Primary care practitioner (PCP)** - health services that cover a range of prevention, wellness, and treatment for common illnesses; these practitioners tend to maintain long-term relationships with their clients and advise and treat a range of health-related issues.
    - **Specialty care practitioner (SCP)** - health services that focus on a specific area of medicine, including but not limited to a specific body system, or group of patients with specific types of symptoms and conditions; these practitioners tend to have more episode-specific interactions with their clients and focus their advice and treatment, the latter of which may include surgical and other less invasive interventions, on a particular body system.

Another critical construct employed in the study is that of a **health coverage program** – the various means through which individuals can access healthcare services, which is also how healthcare practitioners are aligned to manage and deliver healthcare services (those practitioners, or the organizations for whom they work as employees or contractors, have relationships with those programs in order to provide and be compensated for those services). We defined those programs as follows:

- **Traditional Medicare** – the fee-for-service form of the program established by the U.S. federal government in the 1960s and subsequently amended to provide healthcare coverage - including hospital-based care, physician services and prescription drugs - to qualified individuals over a certain age or certain disabled individuals.
- **Medicare Advantage** – also known as "Medicare Part C", the alternative to Traditional Medicare in which individuals enroll in managed care organizations (known as Medicare Advantage Organizations or MAOs) to access the services provided by Traditional Medicare and, in many cases, other services provided by the MAOs as "value-added benefits".

- **Government Health Plan (GHP) or Vital** – inclusive of the Federal population, whose costs are covered by federal funds – Medicaid and Children's Health Insurance Program (CHIP) allotments appropriated by the U.S. Congress - matched as needed with Government of Puerto Rico funds, and the Commonwealth population (funded in full by the Government of Puerto Rico).
- **Medicare Platino** – the adjunct to the GHP which provides service coverage and access to individuals who meet GHP and Medicare eligibility criteria.
- **Government Employee and Retiree Health Plan** – the program that provides health care coverage and access through contracted managed care organizations; the program is known informally as "Ley 95" because of the legislation that established the program in its current form.

- **TRICARE** - the health care coverage program for uniformed services members, uniformed services retirees and family members. TRICARE brings together the health care resources of the Military Health System—such as military hospitals and clinics—and a network of civilian health care professionals, institutions, pharmacies and suppliers.

- **Veterans Administration (VA) Healthcare** –eligible individuals can access a broad array of services through U.S. Department of Veterans Affairs (USDVA) owned and operated hospitals and clinics and the practitioners the departments employs or contracts; VA Healthcare also covers select services delivered outside of USDVA's system of hospitals, clinics and practitioners.

- **State Insurance Fund Corporation (SIFC)** – the program established in 1935 to manage and ensure delivery of services resulting from workplace accidents or workplace-related diseases.

- **Commercial Group and Individual Health Insurance** – in accordance with laws and regulations enforced by the Puerto Rico Office of the Insurance Commissioner, insurance products that provide coverage for certain physical and behavioral health conditions and select "value-added benefits".

The Glossary of Key Terms and Acronyms provides more details on how our team used these and other terms and acronyms in this report and throughout the course of the study.

To properly analyze workforce supply, we believed it was essential to define **supply** as being a function of:

- The **raw counts of individuals that comprise the healthcare workforce** – as derived from the most reliable, complete sources of this information, including but not limited to government agencies that regulate Puerto Rico's healthcare system, healthcare professional licensing boards, organizations that employ/contract, represent and/or provide supports to healthcare professionals and health insurance companies.
- The individual's **availability** – the actual days and the hours within those days in which the individual actually worked and could manage and deliver healthcare services or perform support functions, and the individual's willingness to take on new patients. As a note, this availability information is not always provided to enrollees in health coverage programs; in many other instances the information may be available (for example, in a health plan's provider directory) but it may not be accurate or up-to-date.
- The individual's **operational capacity** – in the world of engineering, terms such as productivity or throughput would be used to describe this property: how many patients, or how many tasks of a particular type, can that individual complete within the time in which the individual is available to work. Operational capacity is directly impacted by the individual's experience and expertise, their access to reliable information and value-adding information systems, facility features or constraints, reliability of utilities, the availability and competency of support resources, and administrative burden borne by the individual or resources that support the individual.

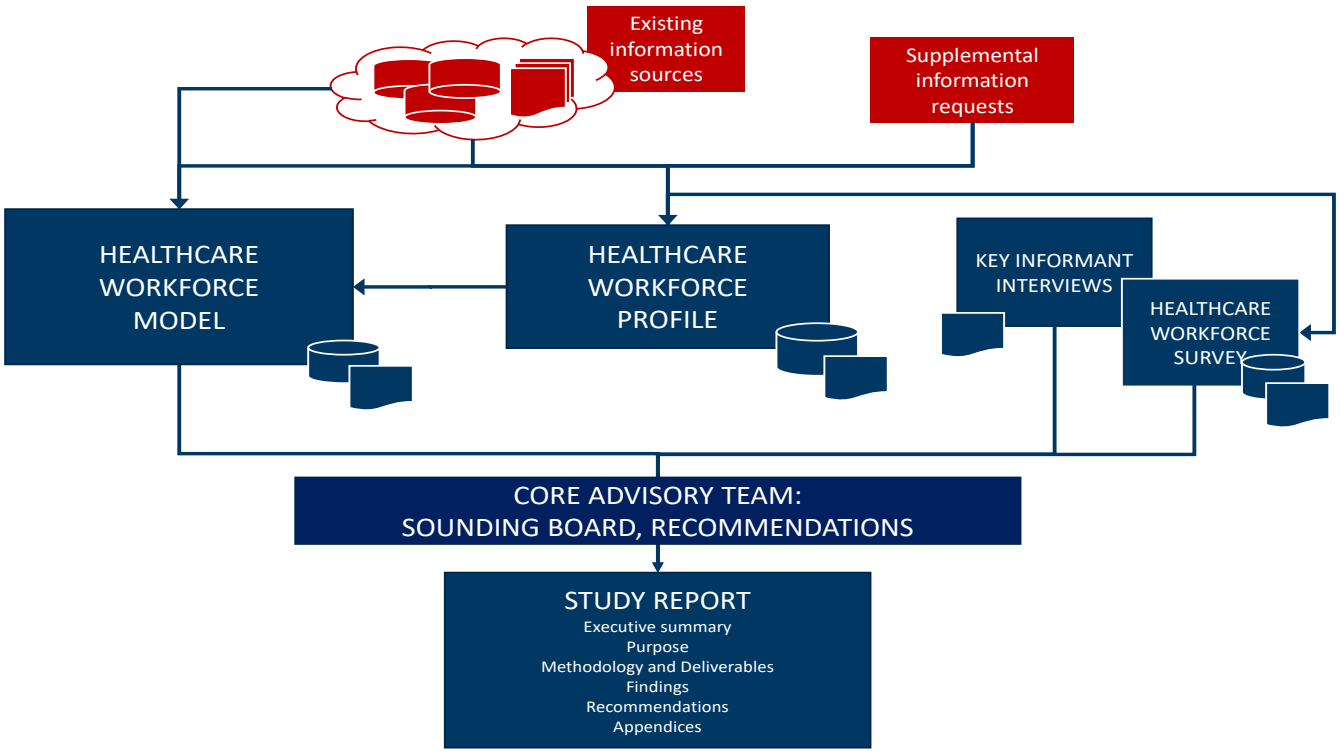
- The individual's **accessibility** – this is a particularly important consideration for healthcare professionals since, for them to deliver effective healthcare, they need to be accessible to their clients. Hence, we define accessibility as the client's ability to actually get to where a professional operates or, conversely, the ability of the professional to actually interact and deliver care to the client in settings that are more accessible to the client – for instance, in the patient's home, at various sites that are easier for the client to reach, or by leveraging "virtual care" solutions.

Utilizing the standardized lexicon and taxonomy described above, we designed an approach to the study that incorporated:

- The creation of a healthcare workforce profile,
- Extensive qualitative and quantitative stakeholder engagement through interviews and a survey (for the survey, an extract from the profile was used to establish sample sizes for different survey cohorts and "push" the survey in a statistically valid manner to potential survey respondents),
- The creation of a dynamic workforce demand-supply model that would draw from an extract of the profile, select findings from the survey, and various sources of workforce demand data, and
- The establishment of a core advisory team comprised of Puerto Rico and U.S. healthcare subject matter experts that represented the entire healthcare system – healthcare professionals, healthcare administrators, support resources, payers and regulators – as well as educational institutions.

The relationship amongst these different **study workstreams** is illustrated in Exhibit 2B, below.

EXHIBIT 2B. HEALTHCARE WORKFORCE STUDY WORKSTREAM RELATIONSHIPS



Following is more detail on the approach employed within each of the study workstreams.

Approach – Workforce Profile

The workforce profile is a multi-dimensional database that captures key attributes of healthcare professionals and administrators including:

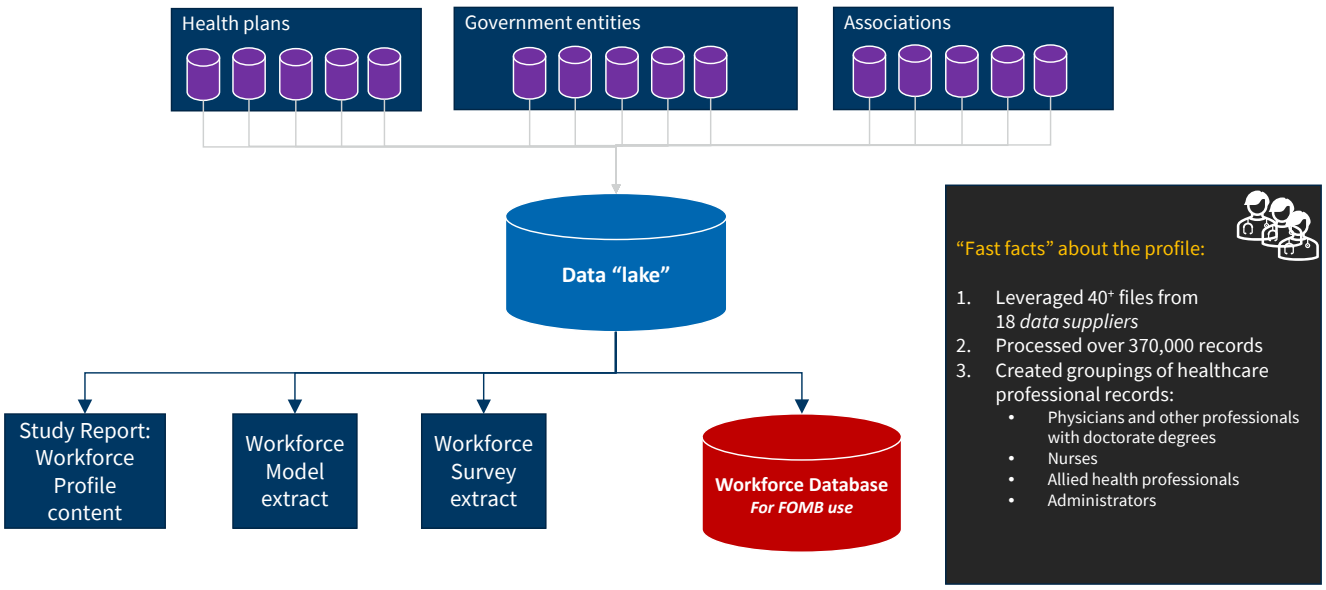
- Subcategory: physicians, nurses, allied health professionals, etc.
- Type: for physicians and other practitioners, type translates to specialty where that information was available; e.g. orthopedics, cardiology, general medicine, etc. In the profile, practitioners could be associated with multiple types; e.g. a physician with multiple specialties.
- Location(s) in which the professional is available to manage and/or deliver healthcare services
- Demographics: the professional's age and gender
- Program participation – Commercial, Medicare Advantage, GHP, Medicare Platino, etc.

Going into the study, we recognized that construction of this profile would requiring linking data from multiple sources to create unique records of healthcare professionals, and in the process:

- Develop algorithms for rating and ranking data from distinct sources,
- Create/establish unique IDs for distinct healthcare professional records,
- Validate that multiple records across data sources or even within a single data source correspond to one individual, and
- Identify and resolve errors through extensive data scrubbing/cleaning

Source data was requested from over twenty potential data suppliers; a data request with content, format and delivery specifications was published and reviewed with all data suppliers. The data which was provided was validated, cleansed, prioritized based on completeness and quality criteria, and reconciled as needed to related data from other sources to construct the profile. Ultimately our team leverage over forty files with over 370,000 records from eighteen distinct data suppliers – licensing boards, other government agencies, associations and insurance companies. Exhibit 2C provides an illustration of how the profile was constructed and the outputs of the profile that were used for various study purposes.

EXHIBIT 2C. HEALTHCARE WORKFORCE PROFILE ARCHITECTURE DIAGRAM



In building the workforce profile, we encountered unanticipated issues securing complete, high-quality data from certain suppliers – data from multiple sources required extensive cleansing, some data were deemed unusable despite multiple submissions and cleansing attempts, and in multiple instances data was not supplied as requested which caused unplanned rework. In other jurisdictions in which the types of data requested already exist in systematically updated, curated platforms such as All-Payer Claims Databases it would have taken considerably less effort and time to build the workforce profile.

Approach – Key Informant Interviews

As part of the larger mixed-methods Puerto Rico Healthcare Workforce Study, we conducted semi-structured interviews with local stakeholders to better understand the current state and future needs of the healthcare workforce. A qualitative research approach using key informant interviews and focus groups was utilized to gain an in-depth, contextualized understanding from diverse stakeholder perspectives. This method allowed for capturing nuanced views and experiences, which are essential for comprehensively understanding the phenomenon.

The research objectives of this qualitative component of the Puerto Rico Healthcare Workforce Study were to:

- Identify gaps, magnitude, and causes of workforce shortages, especially in high-demand sectors;
- Explore healthcare professional retention and migration patterns to and from Puerto Rico;
- Understand future demand based on economic and demographic changes; and
- Inform the design of a quantitative survey instrument.

We also used these forums less explicitly to validate or dispel certain beliefs about the state of Puerto Rico's healthcare workforce, "test-market" certain potential recommendations, and gage the receptiveness of different constituencies to certain messages/means of communication.

To structure the interviews we first developed an interview/focus group guide for assessing three main areas related to the status of Puerto Rico's healthcare workforce:

1. Gaps in the healthcare workforce

2. Factors contributing to workforce shortages

3. Potential solutions and future outlook – this area of the interviews was designed purposely to solicit stakeholder input on specific workforce issues and how to address them and, more broadly, on the state of Puerto Rico's healthcare system and how it impacts both workforce supply and demand.

Three variants of the guide were created to accommodate and align with how we organized the interviews themselves:

- Healthcare Providers: Those involved in direct patient care, including physicians and nurses.
- Health Profession Education Leaders: university and college presidents, deans and program directors of higher education programs.

  Healthcare Industry Leaders: Executives and managers of health sector organizations, including government leaders, association leaders, and members of the c-suite of hospitals, health systems, insurers, physician groups, and primary care providers.

While the core questions remained consistent across all guide variants, the probes within each guide were tailored to reflect the specific roles and responsibilities of individuals in these three stakeholder sectors. This approach ensured the questions were relevant and meaningful, thereby facilitating collection of rich context-specific data.

In total, we conducted twenty-one interviews with sixty participants, some of which were managed like focus groups, with representatives from:

- Government agencies that regulate healthcare, such as the Department of Health and the Health Insurance Administration (Spanish acronym: ASES)
- Government agencies that manage and/or deliver healthcare services, such as the Mental Health and Addiction Services Administration (Spanish acronym: ASSMCA)
- Health insurance companies
- Organizations that represent different types of healthcare professionals and the facilities in which they manage or delivery services – hospitals, physicians, nurses, allied health, etc.
- Patient advocacy organizations
- Organizations that provide healthcare workforce education and training, including but not limited to universities and colleges

Over 1,000 pages of notes were generated from these discussions which were subsequent synthesized and analyzed in accordance with the following principles:

- Rich data: Qualitative methods offer rich, detailed data that help reveal and understand the complexities of workforce issues.
- Stakeholder perspectives: Engaging a variety of stakeholders ensures that multiple perspectives are considered, leading to more comprehensive insights.
- Contextual understanding: Understanding the context-specific challenges and opportunities helps inform and tailor interventions to the unique needs of Puerto Rico's healthcare system.

Approach – Workforce Survey

We designed and conducted two online surveys in support of this study; we were supported by a call center that reached out to respondents as a follow-up mechanism:

- One survey was designed and directed at health care workers in Puerto Rico, with a focus on administrators and healthcare professionals deemed most critical
- A second, distinct survey focused on medical students and residents.

While we purposely included a core set of questions that applied to both surveys, there were numerous questions that only applied to a particular cohort or subset of respondent within a cohort. Thus, the surveys were designed to be "context-sensitive" – responses to certain questions directed respondents to pertinent "downstream" questions.

We derived samples for each survey cohort by leveraging an extract from the healthcare workforce profile as well as data from educational institutions; the samples were structured to ensure the statistical significance and validity of the analysis derived from survey responses. For all cohorts except medical students and residents, we leveraged mixed-mode recruitment for respondents using email and text messaging to maximize response rates; we exceeded most of our target quotas for those cohorts and were able to build samples that enabled statistically significant analysis in addition to considerable stratification and drill down capabilities. For medical students and residents, for various reasons we were unable to survey students and residents under the age of 21; furthermore, because of access constraints imposed by certain universities we were not able to directly outreach students or residents of programs run by those universities. As a result, we were not able to meet the desired sample size for that cohort, our ability to

analyze the data for that cohort is limited, and we need to caveat findings pertaining to that cohort since some inferences may not meet statistical significance guidelines.

The following exhibits provide more perspective on the approach to the survey:

- Exhibit 2D provides an illustration of the surveying process.
- Exhibit 2E provides details on the samples and actual responses received by survey cohort. Note that we purposely "over-sampled" physicians in part because of a recommendation from Impactivo to ensure we could demonstrate that physicians "were heard" through the survey process.

EXHIBIT 2D. HEALTHCARE WORKFORCE SURVEY APPROACH ILLUSTRATION

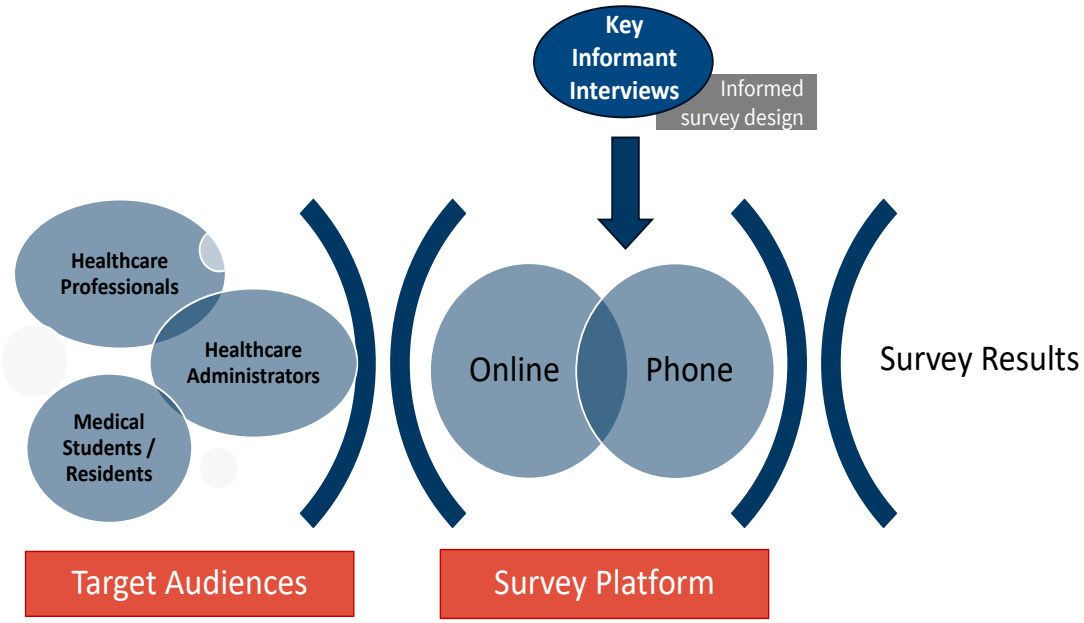


EXHIBIT 2E. HEALTHCARE WORKFORCE SURVEY TARGET SAMPLE SIZES AND ACTUAL RESPONSES

MD/PHD PRACTITIONERS (TARGET SAMPLE=300)	
TOTAL	502
MDs	389
PHDs	113
GENERAL MEDICINE	94
OTHER SPECIALIST (MD)	90
OTHER SPECIALIST (NON-MD)	65
INTERNAL MEDICINE	36
PSYCHIATRIST/PSYCHOLOGIST	69
OTHER SPECIALISTS OF INTEREST	89
PEDIATRIC	36
OBSTETRICS & GYNECOLOGY	14
SURGERY	7

NURSES (TARGET SAMPLE=90)	
TOTAL	155
SPECIALIST NURSE	27
GENERALIST NURSE	128
ALLIED HEALTH PROFESSIONALS (TARGET SAMPLE=75)	
TOTAL	102
BEHAVIORAL & MENTAL HEALTH	2
PHYSICAL THERAPIST	19
RESPIRATORY - THERAPIST/TECHNICIAN	40
OTHER TECHNICIAN	40
ADMINISTRATORS (TARGET SAMPLE=75)	
TOTAL	75
STUDENTS/RESIDENTS (TARGET SAMPLE=300)	
TOTAL	146
STUDENTS	115
RESIDENTS	47

PRIMARY CARE PRACTITIONERS (n = 194)	
GENERAL MEDICINE	GERIATRICS
INTERNAL MEDICINE	OBSTETRICS & GYNECOLOGY
FAMILY MEDICINE	PEDIATRICS

SPECIALTY CARE PRACTITIONERS (n= 173)		
ENDOCRINOLOGY	NUCLEAR MEDICINE	PSYCHIATRY
CARDIOLOGY	OPHTHALMOLOGY	NEUROLOGY
SPECIALTY IN ALLERGY & IMMUNOLOGY	OTOLARYNGOLOGY (ENT)	RADIOLOGY
ANESTHESIOLOGY	PATHOLOGY	ONCOLOGY
DERMATOLOGY	PHYSICAL MEDICINE & REHABILITATION	GENERAL SURGERY
EMERGENCY MEDICINE	PREVENTIVE MEDICINE	NEUROSURGERY
GENETICS & GENOMICS		PLASTIC SURGERY
MEDICINE		UROLOGY
		ORTHOPEDICS

APPROACH – WORKFORCE DEMAND-SUPPLY MODEL

Our workforce model incorporates key elements from the Health Workforce Simulation Model's established framework for the U.S. healthcare workforce. This framework was developed by the federal Health Resources and Services Administration (HRSA) in keeping with its mission of ensuring adequate access to healthcare services, which in turn necessitates a skilled healthcare workforce.

The Issue: The validated accepted perception in Puerto Rico is that the healthcare workforce is currently insufficient to meet the healthcare demands of the Puerto Rico population. In other words, the Puerto Rico workforce is in dis-equilibrium and there is an existing shortage. The shortage gap extends to most primary care providers and specialists, and this shortage is expected to deepen over time. For these reasons, the current workforce supply cannot be used to predict future healthcare workforce supply needs.

The Model: The workforce model uses a benchmarking approach by building in assumptions about service demand and associated workforce needs based on the experience of the U.S. in identifying and addressing certain workforce deficits. Its dynamic nature enables flexibility in modeling changes in service demand across various categories, geographic regions, demographics (age, social vulnerability), and programs (if needed). Based on defensible, data-driven foundations tailored to the unique characteristics of the Puerto Rico healthcare market, this model can be applied to address a range of questions, such as how best to utilize certain funds to drive utilization or promote the availability of certain services. Additionally, it allows for predicting workforce supply gaps by comparing current workforce configuration to projected needs.

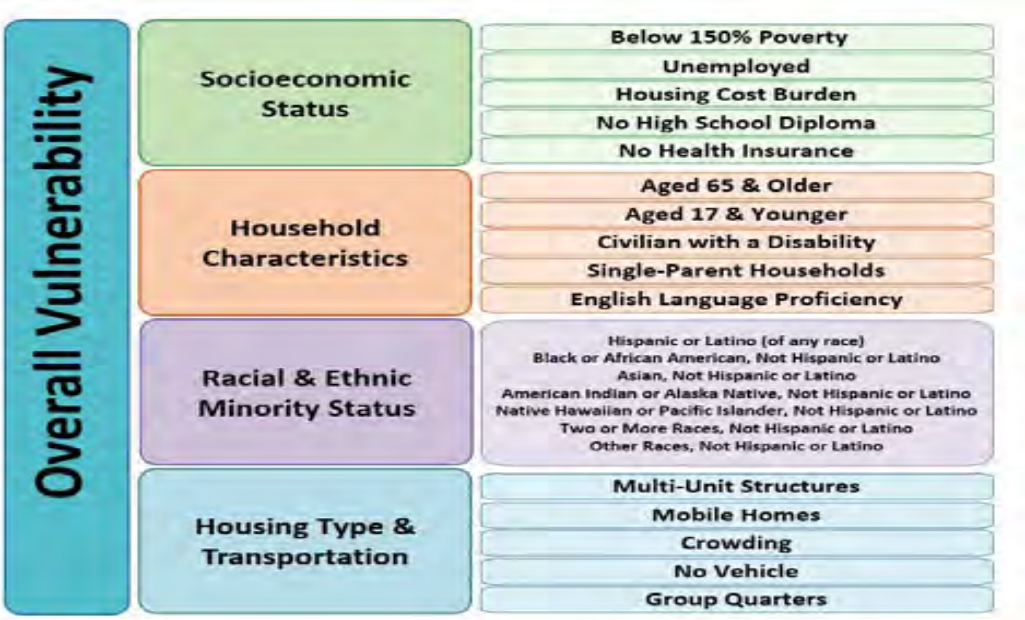
The model focuses on three major components: population growth, demand for providers, and supply of providers.

- **Population Growth**. The model uses Census ACS data for Puerto Rico as its foundation population. It incorporates population projections from the Census International Database (IDB) to forecast future demographic trends. These projections are segmented by age group, county, and region, providing a granular understanding of the evolving population dynamics in Puerto Rico. The data sources for the population growth component include the Census International Database (IDB), the American Community Survey (ACS), and the US Census.

- **Workforce Demand**. The model estimates demand for certain high-profile healthcare professional categories by using the US mainland demand as the benchmark (or 'target'). It uses healthcare utilization rates and staffing ratios to establish baseline demand. Given the unique healthcare landscape of Puerto Rico, the model was adapted to account for factors like specialty shortages, and differing age profiles and disease patterns, providing a more tailored and relevant assessment. The model estimates demand by professional type and projects to 2050 by region. The data sources for the demand component include the American Community Survey (ACS), CDC Behavioral Risk Factor Surveillance System (BRFSS), the Medical Expenditure Panel Survey (MEPS), Bureau of Labor Statistics (BLS), Association of American Medical Colleges (AAMC), Organization for Economic Co-operation and Development (OECD), and HRSA. Encounter data supplied by health insurance companies are also employed to provide additional perspective on healthcare service utilization.

  The demand projections also incorporate **social vulnerability** and its impact on care access and needs. As illustrated in Exhibit 2F, Social Vulnerability refers to the demographic and socioeconomic factors such as poverty, lack of access to transportation, and housing issues that adversely affect communities that encounter hazards and other community-level stressors. In theory, more vulnerable populations would require higher health needs. A Social Vulnerability Index (SVI) ranging from 0 (least vulnerable) to 1 (most vulnerable) is derived from available data and then applied to our model at a regional level. For instance, if a given region has an SVI that is significantly different from the PR overall SVI, an adjustment was made to the demand of selected specialties within the health region, to account for the additional or reduced needs of the population.

EXHIBIT 2F. CAPTURING SOCIAL VULNERABILITY IN OUR WORKFORCE DEMAND-SUPPLY MODEL



- **Healthcare Professional Supply.** The model uses Census ACS data for Puerto Rico as its foundation population. It incorporates population projections from the Census International Database (IDB) to forecast future demographic trends. These projections are segmented by age group, county, and region, providing a granular understanding of the evolving population dynamics in Puerto Rico. The data sources for the population growth component include the Census International Database (IDB), the American Community Survey (ACS), and the US Census. The model utilizes Puerto Rico's workforce data to estimate the current supply of healthcare providers and linear provider growth rate across years. The change in supply between years considers various factors that influence the change in supply, including new entrants, retirements, emigration, and career changes.

  As shown in Exhibit 2G, a large portion of Puerto Rico's healthcare workforce is made up of practitioners over age 60. The aging of the healthcare workforce is particularly pronounced in specialties such as pediatrics, rheumatology, OB/GYN, and surgery, which can pose challenges to the healthcare system as experienced providers are nearing retirement age or providing care at less than full capacity.

  The supply model considers professional availability based on daily patient volume and time spent doing non-administrative work. On average, In the U.S. specialists and primary care physicians (PCPs) see about 20.2 and 19.7 patients per day, respectively. Based on the Puerto Rico Workforce Survey results, on average in Puerto Rico 23 and 21 patients are seen daily by a specialist or PCP, respectively. In the U.S., physicians spend 31 percent of their time on administrative work, on average. Based on the Puerto Rico Workforce Survey Results, Puerto Rico physicians spend an average of 32 percent of their time on administrative work.[6] Given the minimal differences in daily patient volume and administrative workload across specialties between the

[6] Rajaee L., 2022. "How Many Patients Are Most Primary Care Physicians Seeing?" Available at: https://www.elationhealth.com/resources/blogs/how-many-patients-are-most-primary-care-physicians-seeing; Dyton J., 2023. "How Many Hours do Doctors Work?" Available at: https://www.whitecoatinvestor.com/how-many-hours-do-doctors-work/ ; Bae, S. H, 2023. Association of work schedules with nurse turnover: a cross-sectional national study. International Journal of Public Health, 68, 1605732; HRSA, 2023. "VII. Physician Assistant Model Components" Available at: https://bhw.hrsa.gov/data-research/projecting-health-workforce-supply-demand/technical-documentation/physician-assistant-model-components; Regulsky E. "23 Physician Specialties and The Number Of Hours Spent On Paperwork" Available at: https://www.billingparadise.com/blog/23-physician-specialties-and-the-number-of-hours-spent-on-paperwork/#:~:text=According%20to%20the%20Medscape%20Physician,week%20on%20paperwork%20and%20administration; Stites M., 2023 "Nursing Documentation Burden: A Critical Problem to Solve" Available at: https://www.aacn.org/blog/nursing-documentation-burden-a-critical-problem-to-solve#:~:text=The%20U.S.%20Surgeon%20General's%20Advisory,Documentation%20burden%20is%20not%20benign

benchmark (i.e. continental US) and Puerto Rico, no adjustments were made to the projected FTEs. In the model, these professionals were assumed to be working at full capacity (i.e. 1 FTE).

EXHIBIT 2G: AGE BREAKDOWN FOR CERTAIN HEALTHCARE PROFESSIONAL TYPES IN PUERTO RICO – BELOW AND ABOVE AGE 60

Source: Oficina de Reglamentación y Certificación de los Profesionales de la Salud (ORCPS)

Provider Type	60 or Younger	Over 60
General/Family Practice	70%	30%
Intenal Medicine	60%	40%
Pediatrics	48%	52%
OB/GYN	53%	47%
Surgery	53%	47%
Nurse	90%	10%
Physician Assistant	96%	4%
Cardiology	51%	49%
Endocrinology	63%	37%
Gastroenterology	69%	31%
Geriatrics	76%	24%
Nephrology	64%	36%
Oncology	67%	33%
Pulmonology	64%	36%
Rheumatology	46%	54%
Psychology and Psychiatry	81%	19%
Neurology	71%	29%
Orthopedics	65%	35%
Urology	55%	45%
Physical Therapy	80%	20%
Ophthalmology	63%	37%

The supply model considers professional availability based on daily patient volume and time spent doing non-administrative work. On average, In the U.S. specialists and primary care physicians (PCPs) see about 20.2 and 19.7 patients per day, respectively. Based on the Puerto Rico Workforce Survey results, on average in Puerto Rico 23 and 21 patients are seen daily by a specialist or PCP, respectively. In the U.S., physicians spend 31% of their time on administrative work, on average. Based on the Puerto Rico Workforce Survey Results, Puerto Rico physicians spend an average of 32% of their time on administrative work.[7] Given the minimal differences in daily patient volume and administrative workload across specialties between the benchmark (i.e. continental US) and Puerto Rico, no adjustments were made to the projected FTEs. In the model, these professionals were assumed to be working at full capacity (i.e. 1 FTE).

The model estimates supply by provider type and projects to 2050 by region. The primary data sources for the supply component of the model were the "Oficina de Reglamentación y Certificación de los Profesionales de la Salud" (ORCPS) and the "Junta de Licenciamiento y Disciplina Médica" (JLDM).

[7] Rajaee L., 2022. "How Many Patients Are Most Primary Care Physicians Seeing?" Available at: https://www.elationhealth.com/resources/blogs/how-many-patients-are-most-primary-care-physicians-seeing; Dyton J., 2023. "How Many Hours do Doctors Work?" Available at: https://www.whitecoatinvestor.com/how-many-hours-do-doctors-work/ ; Bae, S. H, 2023. Association of work schedules with nurse turnover: a cross-sectional national study. International Journal of Public Health, 68, 1605732; HRSA, 2023. "VII. Physician Assistant Model Components" Available at: https://bhw.hrsa.gov/data-research/projecting-health-workforce-supply-demand/technical-documentation/physician-assistant-model-components; Regulsky E. "23 Physician Specialties and The Number Of Hours Spent On Paperwork" Available at: https://www.billingparadise.com/blog/23-physician-specialties-and-the-number-of-hours-spent-on-paperwork/#:~:text=According%20to%20the%20Medscape%20Physician,week%20on%20paperwork%20and%20administration; Stites M., 2023 "Nursing Documentation Burden: A Critical Problem to Solve" Available at: https://www.aacn.org/blog/nursing-documentation-burden-a-critical-problem-to-solve#:~:text=The%20U.S.%20Surgeon%20General's%20Advisory,Documentation%20burden%20is%20not%20benign

Ultimately, the various components of the workforce demand-supply model come together as illustrated in Exhibit 2H (next page). Specific model outputs include:

- **Population health needs**: Population Health Needs outputs consist of prevalence of major conditions by health region. Conditions assessed include arthritis, asthma, cancer, chronic kidney disease (CKD), chronic obstructive pulmonary disease (COPD), depression, diabetes, high blood pressure (HBP), heart attack, heart disease, and stroke. Prevalence by conditions were projected to 2050.
- **Workforce demand projections**: Health Workforce Demand, calculated using provider and population data, identify the number of providers needed to fully support the population based on continental US experience. Demand was derived by specialty and projected to 2050. Specialties assessed include Cardiology, Endocrinology, Gastroenterology, General/Family Practice, Geriatrics, Internal Medicine, Nephrology, Neurology, Nurse, OB/GYN, Oncology, Ophthalmology, Orthopedics, Pediatrics, Physical Therapy, Physician Assistant, Psychology and Psychiatry, Pulmonology, Rheumatology, Surgery, and Urology. The workforce results in the report are based on the 'Target Workforce (Age-adjusted)' demand scenario.
- **Workforce supply projections**: Number of providers for 2024 was identified by specialty (ex: cardiology, internal medicine, etc.). To project supply to 2050, historical provider growth rates between 2019-2022 and 2022-2024 were derived. Linear supply growth rates were incorporated into the supply calculations. Supply by specialty was projected to 2050, by health region.
- **Workforce demand-supply gap projections:** Health workforce gaps were calculated by simply subtracting the Health Workforce Demand from the Health Workforce Supply, by year, specialty, and region. Gaps were calculated up to 2050.

As a formal deliverable to the FOMB, our team created an artifact in Microsoft Excel that FOMB personnel can use to study visualizations of the model's outputs, mine the model and create their own "what-if" scenarios. As such, the artifact has built-in controls for resetting certain assumptions or testing custom assumptions. Exhibit 2I is a screenshot of one of the visualizations that can be accessed in the artifact.

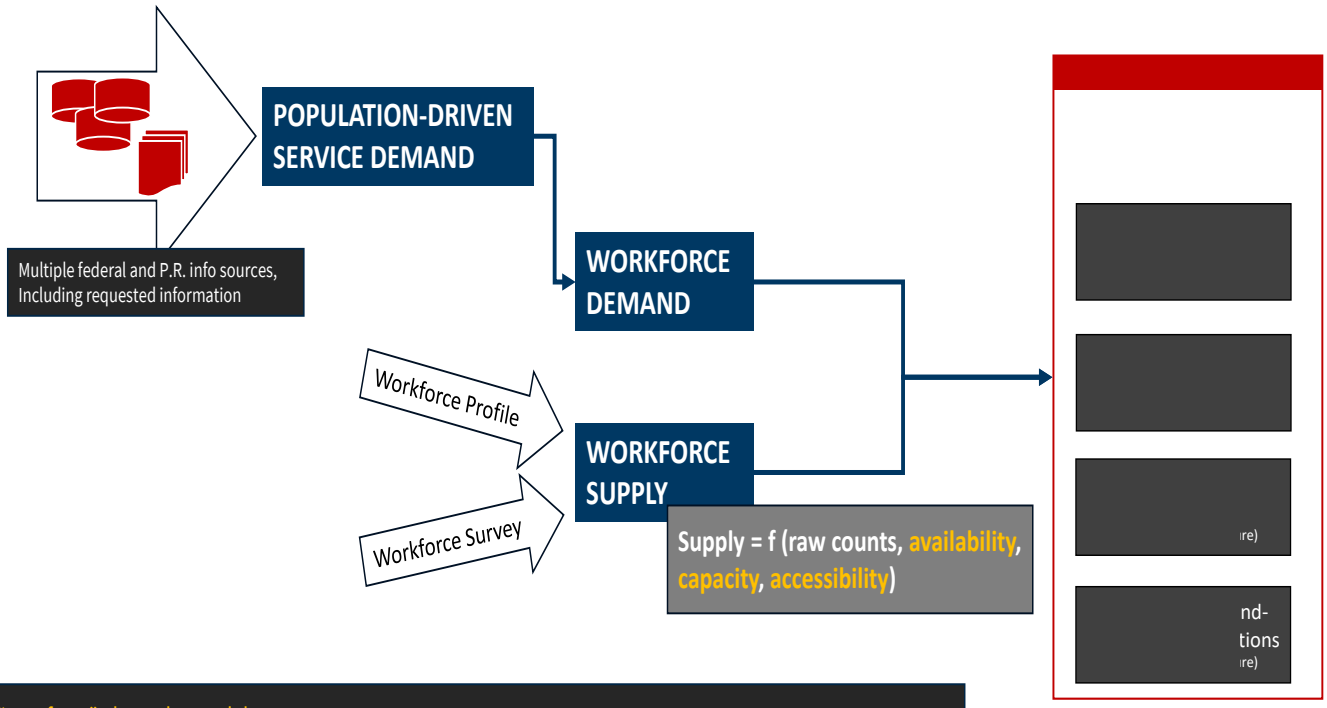
CORE ADVISORY TEAM

The Core Advisory Team was constituted as a critical component of our study. With representation from all healthcare industry segments, in addition to healthcare field experts who worked in similar studies, the team served as:

- An evaluator and critic of our approach to the study,
- A reviewer of findings from the various study workstreams, and
- A "generator" and a "sounding board" of recommendations to address study findings and on the best approach to socializing and achieving buy-in on said recommendations. A particular value this team provided was in the acclimating recommendations to Puerto Rico's political, economic and cultural idiosyncrasies.

The Core Advisory Team met in structured, facilitated sessions six times over the course of the study.

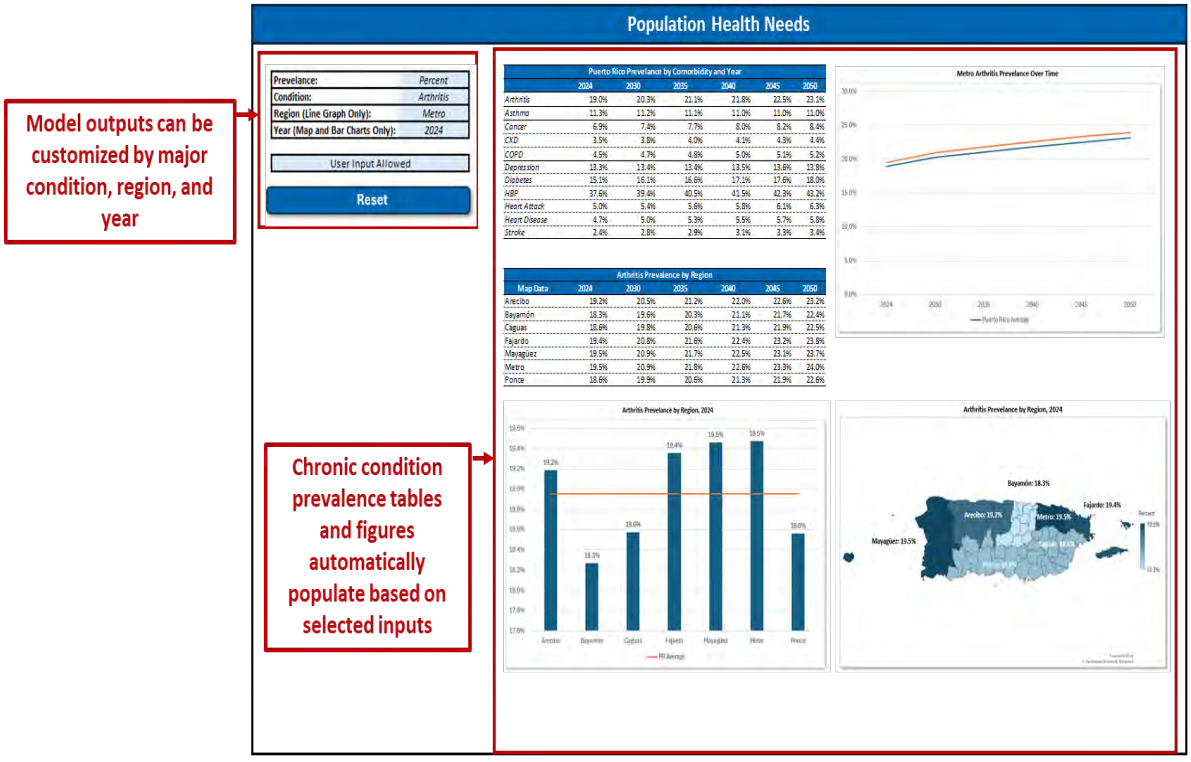
EXHIBIT 2H. HEALTHCARE WORKFORCE DEMAND-SUPPLY MODEL ARCHITECTURE



"Fast facts" about the model:

1. The model leverages multiple authoritative federal and international data sources including the CDC, the Census Bureau, the Bureau of Labor Statistics and the OECD
2. The model also leverages healthcare utilization data from P.R. government agencies and health insurers

EXHIBIT 2I. HEALTHCARE WORKFORCE DEMAND-SUPPLY MODEL ARTIFACT SAMPLE



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ROLES

Different teams within FTI and Impactivo supported the various study workstreams. Throughout the study, our combined team worked very closely with a core team from the FOMB. Following is more detail on the roles these parties played to complete the study.

FTI Healthcare Risk Management and Advisory (HRMA) Practice - Study Design and Project Management

FTI's HRMA practice was represented by Juan Montañez, the study director and lead architect, and Annie Mayol, the study manager who handled day-to-day project management throughout the course of the study. Mr. Montañez and Ms. Mayol have extensive experience working on healthcare projects in Puerto Rico. Mr. Montañez supported ASES during the implementation of the MISalud model within the GHP, led a consultant team that developed a model for implementing a health insurance exchange in Puerto Rico, and has served as an advisor to private sector organizations operating in the healthcare sector in Puerto Rico. Ms. Mayol served as director of federal affairs in Puerto Rico's Office of the Governor, chief of staff to Puerto Rico's health secretary, and in multiple healthcare roles in the private sector. In addition to providing project leadership and serving as the liaison to the FOMB core project team throughout the study, Mr. Montañez and Ms. Mayol were the primary designers and assemblers of this report.

FTI's Center for Healthcare Economics and Policy ("Center") – Workforce Demand-Supply Model

The Center applies cutting-edge economics and quantitative methods to assist clients in developing and implementing market-based solutions across a wide spectrum of healthcare activity. The Center develops economic and financial models and applies evidence-based strategies to address fundamental changes in healthcare demand and delivery within a healthcare system or a region. The Center has employed these capabilities and extensive data sets to address the effects of major policy, regulatory, or significant and disruptive changes on healthcare systems or communities, whether local, regional, national or international. The Center also has extensive predictive modeling and microsimulation capabilities. A dedicated team from the Center led the design, development and construction of the healthcare workforce demand-supply model for this study. The team also created the model artifact which is being delivered to the FOMB, and the workforce modeling report which is included as Appendix B to this report. Dr. Susan Manning, the chief operating officer of the Center, served as a member of the Core Advisory Team.

FTI's Data Management Center of Excellence – Workforce Profile

FTI has a team of data analysts that has been deployed to support a wide range of forensic analysis, business intelligence and investment analysis projects. This team was tasked with the aggregation and harmonization of the many data sources required to construct the workforce profile. Following Ms. Mayol's guidance, the team then created the workforce profile artifact which is being delivered to the FOMB. This team also created the workforce profile report which is included as Appendix A to this report.

FTI Strategic Communications – Stakeholder Engagement/Workforce Survey

FTI's Strategic Communications practice works with clients to help promote organizational value and build effective communication strategies to protect and enhance their business interests with key stakeholder groups. This practice has a comprehensive view of stakeholder engagement and communications with an integrated suite of services comprising research and analysis, public and government affairs, and digital media. This practice also has deep expertise in conducting primary and secondary market intelligence assessments for clients, with an approach tailored to identify key audiences and understand their attitudes, perceptions, and behavioral drivers. A team from this practice was tasked with designing, building and executing the healthcare workforce survey, with input from Mr. Montañez, Ms. Mayol, the team designing the healthcare workforce demand-supply model, and the Impactivo team engaged in key informant interviews. After the Survey was closed, the team from this practice compiled and synthesized the responses from the survey and created the workforce survey report in Appendix C of this report.

FTI – Other Resources

Tipton Ford and Jonathan Myers served as members of our study's Core Advisory Team.

Mr. Ford has more than thirty years of experience across a variety of institutions, including university clinical departments, integrated healthcare systems and community medical groups. Mr. Ford has a proven track record of supporting academic organizations in improving performance across their triparted clinical, educational and research missions. Specifically in the area of medical education, Mr. Ford has advised organizations regarding the strategic mix and scope of resident/fellow education programs, optimized financial structures, improved clinical throughput, and established new teaching programs.

Mr. Myers has almost fifteen years of experience in the areas of federal and state Medicaid program compliance, program oversight and performance monitoring. Mr. Myers served as an advisor to ASES leadership and supported multiple GHP program management functions.

Impactivo – Stakeholder Engagement/Key Informant Interviews

For this project, FTI partnered with IMPACTIVO, a Puerto Rico based consulting firm that specializes in addressing critical healthcare challenges including population health, quality, organizational development, and sustainability. IMPACTIVO has worked with government agencies, publicly traded health management organizations, multinational pharmaceuticals, hospitals, physician groups and community organizations in New York, Massachusetts, Washington, D.C., the U.S. Virgin Islands and Puerto Rico. Given IMPACTIVO's extensive experience leading healthcare projects in Puerto Rico that relied heavily on stakeholder engagement, including but not limited to the Puerto Rico State Innovation Plan project in 2016, FTI tasked IMPACTIVO with developing the methodology, protocols and guides for the study's key informant interviews. Resources from IMPACTIVO, along with Mr. Montañez and Ms. Mayol, conducted the key informant interviews. The IMPACTIVO team then compiled and synthesized the documentation from the interviews to create a key informant interview report which is included as Appendix B to this report. Additionally, resources from IMPACTIVO served on the study's Core Advisory Team.

FOMB Core Project Team – Project Guidance

Throughout the course of this study, the FTI-IMPACTIVO team worked closely with a core project team from the FOMB. The teams met weekly to discuss and rapidly resolve project issues, reach agreement on the content and structure of study deliverables, and review study deliverables. Additionally, the FOMB core project team provided timely guidance on stakeholder engagement questions.

CRITICAL FACTORS AND CONSIDERATIONS

To properly frame the study's findings and recommendations, we wanted to note two critical factors and considerations that impacted the scope and depth of the study.

Availability of high-quality, complete data as requested

FTI issued several information requests to support the creation of the workforce profile and demand-supply model; the information requests also supported establishing sample sizes for survey cohorts and building the database of contacts that was instrumental to reaching out to potential survey respondents. The FOMB core project team supported the FTI team by issuing most of these information requests on behalf of FTI. The response and responsiveness of the information suppliers was mixed. Even though there was collaboration from all the data suppliers outreached for this study, in some instances information we received was incomplete. In other instances, information we received was significantly delayed. We also needed some suppliers to resubmit information because they did not conform to formats and other standards we included in requests. As a result of some of these information issues, we had to rely on data from U.S. based sources in addition to Puerto Rico data sources to ensure we had all of

the information required to build a credible model. Ultimately these information issues did not compromise the quality of the study, but they drove up resource use and the time required to complete the study.

Key stakeholder availability, cooperation and input

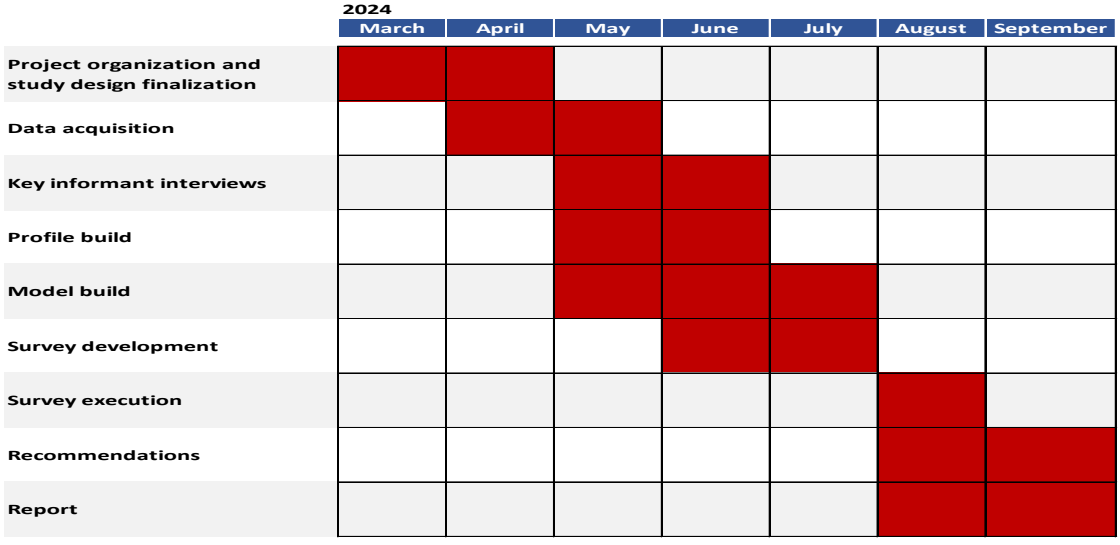
Most stakeholders were very responsive to our requests for time for key informant interviews. That noted, some organizations we had targeted for interviews did not follow through on the invitation; in other instances the interviews were either abbreviated or broken into multiple days/times, which impacted the flow of the sessions. Ultimately the unavailability of a handful of stakeholders did not adversely impact the quality of the study since each stakeholder constituency was very well represented in the key informant interview series, not to mention there was convergence of opinion across constituencies on multiple topics related to Puerto Rico's healthcare workforce.

An unanticipated issue that adversely impacted the survey was the involvement of certain university Institutional Review Boards (IRBs) in the review of the healthcare workforce survey. Based on our experience, the nature of the survey did not lend itself to IRB review or approval[8]. However, since these IRBs inserted themselves in the process of soliciting the participation of medical students and residents in the survey, we proceeded to work with them to secure their support of the study. Through this work, the survey for medical students and residents had to be amended to assuage IRB concerns, and we had no option but to rely on the universities to reach out to students and residents to promote their participation in the survey. The back-and-forth with the IRB, in which they often raised issues in a meeting they had not raised in preceding meetings, delayed the launch of the medical student and resident survey by several weeks and, in our opinion, led to lower-than-expected response rates from that survey cohort. As a result, while we can derive meaningful insights from survey respondents who are medical students and residents, some of the findings cannot be supported by statistical significance testing.

STUDY TIMELINE

The study proceeded as shown in Exhibit 2J, with delays relative to the original timeline which added up to about a month. Those delays were the result of issues with information received from certain suppliers – information which was either incomplete, received late, or both – and our dealings with university IRBs detailed in the CRITICAL FACTORS AND CONSIDERATIONS section of this report.

EXHIBIT 2J. PUERTO RICO HEALTHCARE WORKFORCE STUDY TIMELINE



[8] The type of research conducted as part of this study is not of the type that typically requires IRB *approval* (different from IRB *review*), which typically is limited to research which is funded, conducted or directly sponsored by the university (or when the entity receiving the funding, from a federal agency grant for instance, is the university). Moreover, personally identifiable data was never requested of survey respondents – IRB intervention in a study is more common in instances in which personally identifiable data is needed because of a study's objectives.

STUDY LIMITATIONS

While we designed the study to be quite comprehensive, there are several limitations that warrant discussion:

1. As noted repeatedly throughout this report, a true measure of workforce supply cannot be limited to raw counts but must also take into account an individual's availability, operational capacity and accessibility. The data compiled for this study - outside of the workforce survey which relies solely on a respondent's perception of their availability, capacity and accessibility – does not enable a truly unbiased analysis of these supply factors. That noted, we were able to combine survey responses and key informant interviews to derive findings that point to potential availability, operational capacity and accessibility limitations and associated root causes.

2. As noted previously, the analysis of responses to the medical student and resident survey was impacted by delays and survey modifications resulting from the involvement of university IRBs, which was not anticipated when designing the survey. Furthermore, the selection of respondents was not randomized since we had to relinquish control of the delivery of the survey to the universities. Nonetheless, we expect to be able to derive meaningful, directional observations at the macro level (not stratified) for that cohort.

3. While soliciting the "voice of the consumer" was an option in this study, we focused our efforts on understanding the dynamics of the healthcare workforce from the perspective of the workforce itself, those who manage the workforce, and those who employ/contract with them for services. That noted, while we leverage numerous data sets from multiple sources to build a highly credible workforce demand model, there would be value in a future project to conduct stakeholder engagement with healthcare consumers to understand healthcare workforce challenges from their vantage point (e.g. issues of availability, accessibility, and drivers of healthcare demand beyond what can be inferred from statistics).

4. Concerns about the quality and completeness of healthcare professional data from health insurance companies prevented us from conducting an in-depth analysis of the networks of these companies to flag potential "bottlenecks". A related issue raised in key informant interviews is that the same scarce healthcare professionals, particularly specialty care practitioners, appear to be participating in the networks of multiple insurance companies and, as such, create the impression that the networks are fully equipped to meet the needs of all of their members.

5. The issue of healthcare funding in Puerto Rico came up repeatedly in stakeholder engagement, and it has received extensive press over the last fifteen years. An argument has been made about the historical constraints in federal Medicaid and Medicare funding having contributed to Puerto Rico's debt crisis, as heavy borrowing was attributed in part to offsetting the gap in federal healthcare funding – particularly Medicaid funding – vis-à-vis the levels of funding Puerto Rico would have accessed as a U.S. state. There was also considerable discussion in our stakeholder engagement about the impact the funding shortages have on developing and then retaining a competent, "right-sized" healthcare workforce. All that notwithstanding, in our study we did not explicitly look at funding or compensation issues from a quantitative perspective. However, our healthcare demand-supply model was designed to enable analyzing the impact of potential funding increases – the direct impact that could have on workforce supply, as well as how funding increases could be employed to provide coverage for services that could help close the demand-supply gap. We strongly believe there would be value in a future project focused on modeling different potential uses of increases of federal healthcare funding for Puerto Rico.

3. Findings – State of Puerto Rico's Healthcare Workforce

This section details key findings derived from all study components – workforce profile, key informant interviews, survey, model – regarding the following:

- Counts by type of healthcare professional
- Geographical distribution by type of professional
- Trends and expectations regarding changes in counts by type of professional
- Comparison to benchmarks
- Caveats – in particular, limitations regarding our ability to establish availability, capacity and accessibility of certain types of healthcare professionals.

Throughout this section, we call out findings that may not align with "conventional wisdom" – general assumptions and beliefs about Puerto Rico's healthcare workforce that are not supported by our analysis.

DEMAND-SUPPLY GAPS

The model suggests there is significant misalignment between demand and supply across multiple healthcare workforce categories. We define misalignment as supply significantly exceeding demand or, conversely, demand significantly exceeding supply. The projected misalignment based on the model by type of healthcare professional studied is shown in Exhibit 3A.

The model also suggests that the magnitude of the misalignment is impacted by:

- Patient demographic factors – all else being equal, older Puerto Ricans have greater difficulty accessing services than younger Puerto Ricans.
- Geography – Puerto Ricans living in more rural regions – less densely populated and farther from Puerto Rican's larger population centers – have greater difficulty accessing services than Puerto Ricans who live in those population centers. The high geographic concentration of certain healthcare practitioners, especially in the San Juan metropolitan area, creates significant accessibility issues.
- Category of service – there are certain workforce professional types for which the misalignment is greatest, including but not limited to endocrinology, gastroenterology, geriatrics, nephrology, oncology, orthopedics, physical therapy, psychology/psychiatry and urology geriatrics, orthopedics and urology. There is also a critical gap in clinical support staff, such as physical therapists, which is particularly critical to the management of an elderly population and patients with multiple diseases.
- Healthcare professional age - within workforce categories where we identified significant misalignment between demand and supply, the misalignment is exacerbated by age concerns – a significant percentage of healthcare practitioners, particularly specialty care practitioners, is at least age 65.

The model projects widening demand-supply gaps across most specialty care practitioners, with the most acute shortages found **in endocrinology, gastroenterology, nephrology, psychology and psychiatry**. These gaps are exacerbated by the aging population, which has higher incidence of diabetes, hypertension, cognitive impairment and other common conditions among that population. In parallel, Puerto Rico is experiencing a rising demand for behavioral healthcare services, a need that is currently underserved due to the lack of trained specialists. These gaps are likely to be greater than forecasted due to differences in workforce availability, operational capacity, and patient access compared to U.S. benchmarks and because so many of these practitioners are age 65 or older; an acceleration of their retirements would be calamitous.

The story is not that different with primary care practitioners – while the model projects a surplus with respect to this category of professionals in the aggregate, the removal of OB/GYN physicians and pediatricians from the calculation results in a net deficit of this type of practitioner. The deficit of PCPs – 4 percent in 2024 – is not as severe as the specialty care practitioner deficit – 26 percent – but is nonetheless significant. It should be noted that since our model incorporates U.S. benchmarks, our PCP calculations incorporate data for physician assistants (PAs) even though that profession was not legally recognized in Puerto Rico until 2017. Moreover, in Puerto Rico PAs must practice under direct physician supervision, whereas in the U.S. PAs are recognized as licensed medical professionals with greater practice autonomy.

EXHIBIT 3A. OVERALL GAPS BY PRACTITIONER TYPE ASSUMING PRACTITIONERS WORK AT "FULL CAPACITY"

Practitioner Type	Demand (2024)	Licensed Professionals (2024)	Gap: (Licensed Professionals - Demand)					
			2024	2030	2035	2040	2045	2050
Primary Care	**6,417**	**7,017**	**600**	**964**	**1,398**	**1,940**	**2,565**	**3,212**
Family Medicine	433	532	99	118	141	171	205	237
General Medicine	3,062	3,765	703	833	1,000	1,212	1,448	1,676
Geriatrics	37	21	-16	-24	-28	-31	-32	-33
Internal Medicine	905	1,357	452	681	916	1,192	1,509	1,860
OB/GYN	237	456	219	210	206	204	204	203
Pediatrics	242	863	621	603	578	547	522	499
Physician Assistant	1,501	23	-1,478	-1,456	-1,415	-1,356	-1,290	-1,230
Specialty Care	**4,917**	**3,631**	**-1,286**	**-1,305**	**-1,262**	**-1,153**	**-1,001**	**-866**
Cardiology	265	254	-11	-21	-27	-30	-32	-35
Endocrinology	188	97	-91	-106	-111	-111	-109	-106
Gastroenterology	245	157	-88	-106	-113	-115	-113	-111
Nephrology	190	103	-87	-105	-113	-116	-118	-118
Neurology	83	168	85	86	91	97	105	113
Oncology	152	101	-51	-57	-58	-55	-48	-42
Ophthalmology	132	222	90	107	125	146	169	192
Orthopedics	277	139	-138	-120	-101	-78	-53	-28
Psychology and Psychiatry	2,733	1,783	-950	-945	-929	-883	-817	-770
Pulmonology	50	72	22	16	12	9	6	4
Rheumatology	70	68	-2	-5	-8	-10	-11	-12
Surgery	385	367	-18	-13	-4	8	22	34
Urology	147	100	-47	-37	-27	-15	-2	10
Nurse	**39,970**	**46,613**	**6,643**	**8,213**	**9,701**	**11,413**	**13,130**	**14,590**
Physical Therapy	**8,204**	**1,338**	**-6,866**	**-6,654**	**-6,363**	**-5,982**	**-5,563**	**-5,180**

Practitioner Type	Demand (2024)	Licensed Professionals (2024)	% Gap: [(Licensed Professionals - Demand)/Demand]-1					
			2024	2030	2035	2040	2045	2050
Primary Care	**6,417**	**7,017**	**20%**	**23%**	**26%**	**30%**	**34%**	**39%**
Family Medicine	433	532	23%	27%	33%	40%	47%	55%
General Medicine	3,062	3,765	23%	27%	33%	40%	47%	55%
Geriatrics	37	21	-43%	-64%	-75%	-83%	-87%	-89%
Internal Medicine	905	1,357	50%	75%	101%	132%	167%	206%
OB/GYN	237	456	92%	88%	87%	86%	86%	86%
Pediatrics	242	863	257%	249%	239%	226%	216%	206%
Physician Assistant	1,501	23	-98%	-97%	-94%	-90%	-86%	-82%
Specialty Care	**4,917**	**3,631**	**-21%**	**-20%**	**-19%**	**-17%**	**-14%**	**-12%**
Cardiology	265	254	-4%	-8%	-10%	-11%	-12%	-13%
Endocrinology	188	97	-48%	-56%	-59%	-59%	-58%	-56%
Gastroenterology	245	157	-36%	-43%	-46%	-47%	-46%	-45%
Nephrology	190	103	-46%	-55%	-59%	-61%	-62%	-62%
Neurology	83	168	102%	104%	109%	117%	126%	136%
Oncology	152	101	-34%	-38%	-38%	-36%	-32%	-27%
Ophthalmology	132	222	68%	81%	95%	111%	128%	145%
Orthopedics	277	139	-50%	-43%	-36%	-28%	-19%	-10%
Psychology and Psychiatry	2,733	1,783	-35%	-35%	-34%	-32%	-30%	-28%
Pulmonology	50	72	45%	32%	24%	18%	13%	9%
Rheumatology	70	68	-2%	-7%	-11%	-14%	-16%	-17%
Surgery	385	367	-5%	-3%	-1%	2%	6%	9%
Urology	147	100	-32%	-25%	-18%	-10%	-2%	7%
Nurse	**39,970**	**46,613**	**17%**	**21%**	**24%**	**29%**	**33%**	**37%**
Physical Therapy	**8,204**	**1,338**	**-84%**	**-81%**	**-78%**	**-73%**	**-68%**	**-63%**

While the model suggests there are small surpluses among certain SCPs – for instance, neurology, ophthalmology and pulmonology – as noted previously this surplus is likely overstated because of issues regarding availability, operational capacity and accessibility which were captured in key informant interviews and the survey. For instance, even though specialists who responded to the workforce survey reported seeing more patients per day than primary care physicians, they also reported spending slightly more administrative time than primary care physicians, and are more likely to spend more time on administration than patients compared to primary care physicians.

Moreover, there is anecdotal evidence that even within SCPs in "surplus" there may be **deficits in subspecialties within a specialty**. For instance, we heard repeated concerns about the availability of retinologists, cataract surgeons, glaucoma specialists and ocular oncologists. Furthermore, as with other specialists ophthalmologists tend to be concentrated in high-density urban areas of Puerto Rico. Finally, in our model we assumed all SPCs under the age of 80 were working at full capacity and that SPCs would defer retirement till that age, which may become increasingly difficult to sustain.

Indications of the pressures specialty care practitioners are facing include:

- Survey results also indicate that 34 percent of specialists are actively seeking additional sources of income, with many exploring new employment opportunities.
- A significant percentage of specialists is considering relocating, with 52 percent contemplating positions in the continental U.S. and 20 percent considering splitting their time between Puerto Rico and other locations.
- Among specialists aged 60 and older, 66 percent plans to retire within the next five years.

PCPs are not immune to some of those pressures, with more than 20 percent of primary care practitioners being over the age of 65 and many indicating in the survey that they expect to retire in the coming years.

The model also projects a significant shortage of **physical therapists** in Puerto Rico. In the U.S., physical therapists are a critical component of healthcare delivery, often serving as a major provider of post-operative services that prevent adverse events and repeat hospitalizations and a first point of referral before a specialist is consulted for certain types of conditions. Several factors contribute to the shortage of physical therapists in Puerto Rico, including licensing requirements, payment structures, and benefit coverage. Recent regulatory changes now require physical therapists to hold a doctorate degree for licensure, a requirement that conflicts with existing compensation structures. Physical therapists in Puerto Rico often earn wages similar to those in less demanding industries, reducing the incentive to pursue or remain in the profession. Furthermore, Medicaid in Puerto Rico has not historically covered certain long-term care services, such as home care, which typically require physical therapy.

Indications of the pressures physical therapists are experiencing include:

- Survey data reveals that 54 percent of physical therapists rate their working conditions negatively, and half report experiencing regular burnout.
- While improved working conditions are a priority, better salary and benefits rank as the top reasons for seeking new employment, with 88 percent of respondents citing higher earning potential as the main factor.
- Nearly two-thirds of physical therapists are pursuing additional income sources, with almost half actively seeking new job opportunities.

The final area of focus within our model was **nurses**. Contrary to conventional wisdom, the model projects a surplus of nurses in Puerto Rico when demand for nursing is projected based on U.S. utilization benchmarks. That noted, when this projection is analyzed in conjunction with findings from the key informant interviews and survey, we arrive at a different conclusion: while Puerto Rico's education system is producing nurses, the system is not producing enough to keep up with emigration to the U.S. or growing direct patient care needs.

A proper analysis of Puerto Rico's nursing workforce must account for the nursing shortage in the United States which has been well documented and extensively analyzed. As in the case of Puerto Rico, the U.S. is producing nurses – according to the federal Bureau of Labor Statistics, the Registered Nursing (RN) workforce is expected to grow by 6 percent over the next decade. However, that growth is not expected to be sufficient to keep up with retirements (many of which are early retirements prompted by exhaustion stemming from the COVID pandemic and other pressures). A study published in 2022 noted that the total supply of RNs decreased by over 100,000 across the U.S. between 2020 and 2021, with a significant percentage of the reduction driven by younger, hospital-based nurses leaving the workforce[9].

Given this dynamic, it stands to reason that nurses educated and trained in Puerto Rico – where professional standards are comparable to the U.S. – would be in very high demand in the U.S, particularly given the growth of the Hispanic population (including in states such as Florida and Texas where there is already a large Puerto Rican population and no state income tax). Findings from the key informant interviews and survey support this hypothesis:

- Interviewees indicated that retaining nurses that can provide direct patient care remains a significant challenge.
- Informants reported that many registered nurses leave the profession due to high-stress working conditions and low pay - nursing wages in Puerto Rico are comparable to those in industries like beauty services, making it harder to retain them.
- Furthermore, it appears that many nurses are leaving Puerto Rico - mainland U.S. healthcare facilities, where wages are two to three times higher than in Puerto Rico, can attract and are actively recruiting experienced nurses. Local healthcare providers are unable to match these offers. Hospital administrators who responded to our survey indicated they have the most difficult time recruiting and retaining nurses than any other workforce category, and that their inability to provide attractive, competitive compensation was the major impediment. While we were not able to quantify this emigration, nearly all informants and many survey respondents noted this was a real phenomenon.

Surveyed nurses reported spending more time on administrative tasks than physicians – 42 percent for nurses vs 32 percent for physicians – with fewer nurses stating they are able to prioritize patient care over administrative responsibilities. In addition, 63 percent of nurses are actively seeking additional income, with only 42 percent planning to remain in healthcare. Nurses also reported higher levels of burnout and dissatisfaction with working conditions compared to physicians, driving many to seek new employment opportunities.

COMPETENCY CONCERNS

The ability of general medicine physicians, who do not attend a Graduate Medical Education (GME) residency program, to manage patients – particularly elderly patients with multiple chronic conditions – and the resulting "excess" referrals to specialty care practitioners was raised often in key informant interviews. From the many comments about this issue, we infer this concern stems from several factors:

- The scope of post-medical school training and clinical experience these physicians receive.
    - Among the residents and medical students surveyed who rate their program acceptable/not good/poor (24 percent), their attitudes are driven by complaints of lack of academic strength, lack of clinical opportunities and not feeling they are a priority to administrators.

[9] https://www.aacnnursing.org/news-data/fact-sheets/nursing-shortage

AMONG STUDENTS WHO RATE PROGRAM AS ACCEPTABLE/NOT GOOD/POOR

"I FIND THAT THEY ARE PROVIDING THE CORRECT AND APPROPRIATE EDUCATION HOWEVER THEY DO NOT USE THE BEST STAFF TO MAXIMIZE ACADEMIC ACHIEVEMENT, SINCE THEY DO NOT UNDERSTAND EACH OTHER WELL AND/OR DO NOT SPEAK CORRECTLY EITHER OF THE TWO LANGUAGES IN WHICH IT IS TAUGHT IN THE INSTITUTION."

"THE INSTITUTION TRIES TO DO WHAT THEY CAN FOR STUDENTS AND THEY HAVE MADE CHANGES TO IMPROVE THE ACADEMIC SYSTEM CURRENTLY. THERE IS STILL A LOT OF ROOM FOR IMPROVEMENT BUT THERE ARE DOCTORS WHO ARE WILLING TO GO THE EXTRA MILE IN ENSURING THAT STUDENTS DO WELL AND OBTAIN THE NECESSARY INFORMATION AND SKILLS FOR OUR FUTURE PATIENTS."

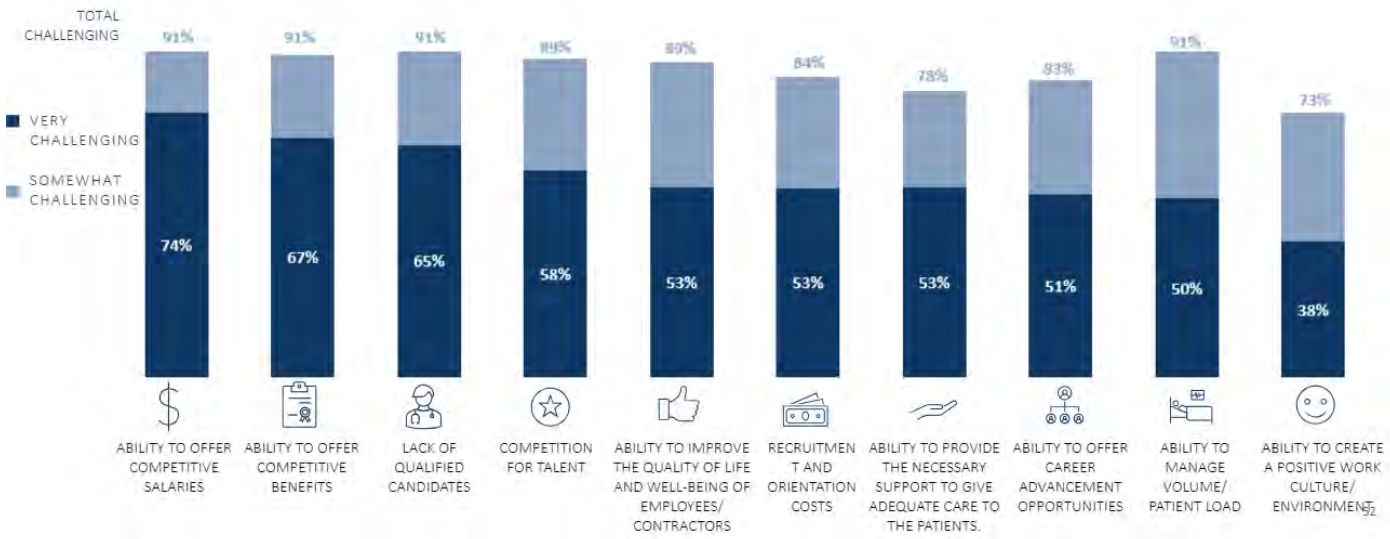
"AFTER SPENDING TWO YEARS CONDUCTING RESEARCH AT AN INSTITUTION IN THE U.S., I'VE REALIZED HOW MUCH WE LACK IN CLINICAL OPPORTUNITIES. FOR EXAMPLE, THIRD-YEAR ROTATIONS; IN MY SCHOOL, THEY ARE VERY POORLY DESIGNED, AND BY THE END OF THE ROTATION, WHAT YOU LEARN IS SUPERFICIAL. ON THE OTHER HAND, THE VARIETY IN CLINICAL ROTATION OFFERINGS IS LACKING; WE NEVER ROTATE THROUGH AN ER, A TRAUMA SERVICE, AN INTENSIVE CARE UNIT, OR ANY OF THE OTHER SUBSPECIALTIES LIKE NEUROSURGERY, ORTHOPEDICS, ETC. COMPARED TO STUDENTS IN THE U.S., WE FALL BEHIND WHEN IT COMES TO CLINICAL EXPOSURE."

"THE STUDENT IS NOT A PRIORITY. TEACHERS DON'T TEACH PROPERLY TO HELP US PASS THE STEPS AND THE ADMINISTRATION MAKES DETERMINATION AFTER DETERMINATION THAT CAUSES THEIR STUDENTS TO BE AFFECTED. CONSEQUENTLY, THEY MAKE US LESS COMPETITIVE STUDENTS. IF YOU COME OUT A GOOD DOCTOR, IT'S ON YOUR OWN, NOT THE SCHOOL."

- The level of compensation they typically receive under the GHP, which is equivalent to the compensation that practitioners who have graduated from a three-year, GME-accredited residency program receive, which leads to certain expectations being placed on these physicians which they may not be able to meet.
- Their ability and/or willingness to support inpatient or home-based care – a reasonable expectation, particularly given our model's findings that primary care practitioner supply exceeds demand based strictly on counts of professionals and our understanding that these physicians tend to operate closer to their patients, is that these physicians would be more available to conduct rounds and home visits. However, according to survey findings these physicians stated they only spend 15 percent of their time providing inpatient care, and 5 percent in home care (see Exhibit 3B). Administrative burden could be playing a role in this, which we explore later in this report.

Key informants also noted that many recent nursing graduates are inadequately prepared for real-world patient care. This issue stems from an over-reliance on simulation-based training programs, which were introduced to address the shortage of clinical training opportunities. As a result, many healthcare providers are reluctant to hire these graduates, believing they lack the necessary practical skills. The survey to healthcare administrators showed that one of the top three challenges in the recruitment and retention of nurses is the lack of qualified candidates.

EXHIBIT 3B. CHALLENGES TO RECRUITMENT AND RETAINING NURSES AND HEALTH CARE PROFESSIONALS



WORKFORCE SUPPLY DOES NOT EQUATE TO WORKFORCE ACCESS

As we note throughout this study, a critical consideration of our analysis is whether the supply of healthcare workforce is actually translating into timely access to services so that workforce demand can be addressed by those services. While we had some limitations in terms of quantifying critical drivers of supply – availability, operational capacity and accessibility – the key informant interviews and survey responses provide strong indications that, in effect, supply is not translating to access across many workforce categories. This phenomenon may be due to various factors discussed in this section of the report.

An aging healthcare workforce

Data from the study demonstrated that, unlike national benchmarks many healthcare professionals in Puerto Rico work past the year of 65 – even past age 80. Because of this, we built into our modeling a baseline assumption that healthcare professionals in Puerto Rico work till the age of 80. That noted, for numerous reasons – from access to/use of information systems to the natural functional limitations that come with age – the availability and operational capacity of older professionals may not equal that of younger professionals. Moreover, according to the survey many physicians age 60 and over are planning to retire within the next five years (refer to Exhibit 3C).

EXHIBIT 3C. OVERALL GAPS BY SPECIALTY ASSUMING ALL PROVIDERS WORK AT FULL CAPACITY

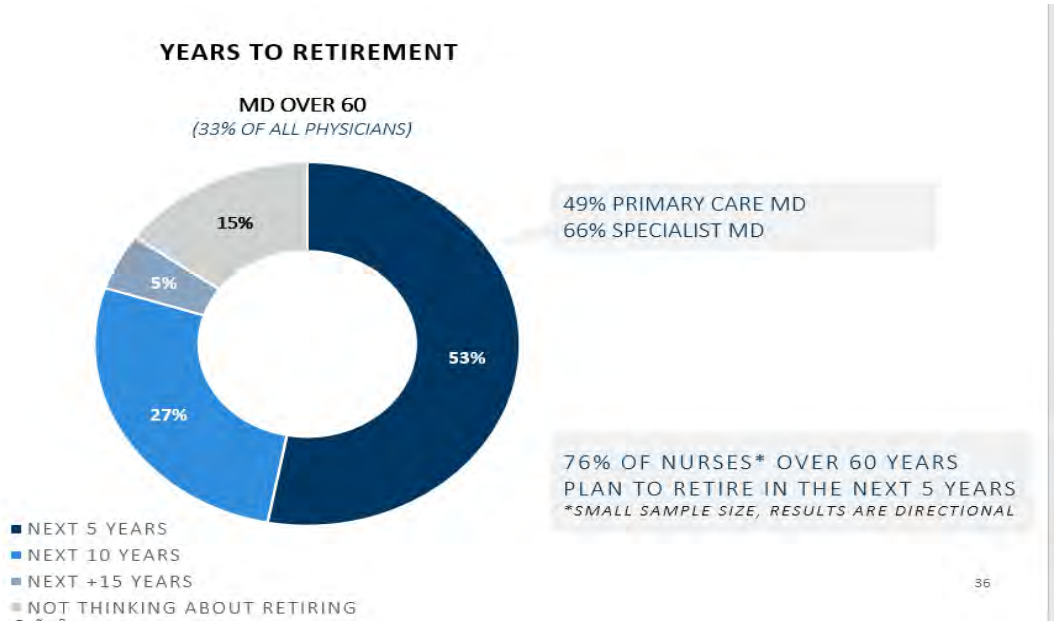


Exhibit 3D provides more details on the age distribution within certain healthcare professional categories. The aging of healthcare professionals is particularly pronounced in certain specialties such as pediatrics, rheumatology, OB/GYN, and surgery. Beyond the challenges to the healthcare system posed by experienced providers leaving the workforce, there is the concern regarding availability and operational capacity noted previously.

To examine the impact of this aging phenomenon in more depth, we ran a scenario in our workforce model in which we restricted the age of practicing healthcare professionals to 65 or less. As shown in Exhibit 3E, under that scenario the demand-supply gap is seriously exacerbated for certain specialties.

- Under this scenario, the Model projects significantly higher workforce shortages for cardiology, endocrinology, gastroenterology, nephrology, physical therapy, and psychology and psychiatry.
- Much tighter surpluses become apparent in general/family practice, internal medicine, OB/GYN, ophthalmology, pediatrics, and pulmonology.

EXHIBIT 3D. AGE BREAKDOWN OF SELECT HEALTHCARE PROFESSIONAL CATEGORIES IN PUERTO RICO

Provider Type	60 or Younger	Over 60
General/Family Practice	70%	30%
Intenal Medicine	60%	40%
Pediatrics	48%	52%
OB/GYN	53%	47%
Surgery	53%	47%
Nurse	90%	10%
Physician Assistant	96%	4%
Cardiology	51%	49%
Endocrinology	63%	37%
Gastroenterology	69%	31%
Geriatrics	76%	24%
Nephrology	64%	36%
Oncology	67%	33%
Pulmonology	64%	36%
Rheumatology	46%	54%
Psychology and Psychiatry	81%	19%
Neurology	71%	29%
Orthopedics	65%	35%
Urology	55%	45%
Physical Therapy	80%	20%
Ophthalmology	63%	37%

Source: Oficina de Reglamentación y Certificación de los Profesionales de la Salud (ORCPS)

EXHIBIT 3E. DEMAND-SUPPLY GAPS BY SPECIALTY ASSUMING PROFESSIONALS ARE RESTRICTED TO PRACTICE ONLY UNTIL AGE 65

	2024 Demand		2024 Licensed Professionals		2024 Gap	
Age inclusion criteria	≤65 (alternate)	<80 (base)	≤65 (alternate)	<80 (base)	≤65 (alternate)	<80 (base)
Primary Care	**6,417**	**6,417**	**5,418**	**7,017**	**-999**	**600**
General/Family Practice	3,496	3,495	3,512	4,297	16	802
Geriatrics	37	37	16	21	-21	-16
Internal Medicine	904	905	1,018	1,357	114	452
OB/GYN	237	237	298	456	61	219
Pediatrics	242	242	552	863	310	621
Physician Assistant	1,501	1,501	22	23	-1,479	-1,478
Specialists	**4,917**	**4,917**	**2,946**	**3,631**	**-1,971**	**-1,286**
Cardiology	265	265	176	254	-89	-11
Endocrinology	188	188	75	97	-113	-91
Gastroenterology	245	245	128	157	-117	-88
Nephrology	190	190	74	103	-116	-87
Neurology	83	83	142	168	59	85
Oncology	152	152	79	101	-73	-51
Ophthalmology	132	132	169	222	37	90
Orthopedics	277	277	115	139	-162	-138
Psychology and Psychiatry	2,733	2,733	1,581	1,783	-1,152	-950
Pulmonology	50	50	55	72	5	22
Rheumatology	70	70	41	68	-29	-2
Surgery	385	385	247	367	-138	-18
Urology	147	147	64	100	-83	-47
Nurse	**39,970**	**39,970**	**44,843**	**46,613**	**4,873**	**6,643**
Physical Therapy	**8,204**	**8,204**	**1,198**	**1,338**	**-7,006**	**-6,866**

- Moreover, this scenario also assumes that each practitioner is working at full capacity in seeing patients. FTI compared the physician daily patient volume and administrative work burden inherent in the Target Age-Adjusted U.S. staffing ratios with those in Puerto Rico. Data for Puerto Rico was based on the Workforce Survey conducted by FTI. U.S. data was obtained through various sources (see Appendix C). Physicians in Puerto Rico are spending less time than their stateside counterparts in patient care.

Exhibit 3F provides a comparison of these differences.

Bandwidth

We built our workforce model to test different assumptions regarding healthcare professional bandwidth – a combination of availability and operational capacity. As noted previously, our baseline modeling assumption was that practitioners were able to operate at "full capacity" vis-à-vis U.S. benchmarks. FTI compared the physician daily patient volume and administrative work burden inherent in the Target Age-Adjusted U.S. staffing ratios with those in Puerto Rico. Data for Puerto Rico was based on the Workforce Survey conducted by FTI. U.S. data was obtained through various sources (refer to Appendix C). Results from the survey notwithstanding, it appears that physicians in Puerto Rico spend less time than their stateside counterparts in direct patient care. However,

- In the U.S., on average, SCPs and PCPs see about 20.2 and 19.7 patients per day, respectively. Based on the workforce survey results, on average Puerto Rico SCPs and PCPs see 23 and 21 patients daily, respectively.
- For administrative burden, in the U.S. on average physicians spend 31 percent of their time on administrative work. Based on the Workforce Survey results, physicians in Puerto Rico spend an average of 32 percent of their time on administrative work. However, a quarter of physicians surveyed stated they spend more than half of their time in administrative work – this percentage is even higher among specialists. This suggests that while the administrative burden on physicians may be similar in Puerto Rico and the U.S. *on average*, there is considerably more variance in Puerto Rico. The variance may be attributed to multiple factors, from the lack of adequate, stable administrative support to the lower adoption of electronic health record systems which we discuss later in this report.

EXHIBIT 3F: NUMBER OF WORKING AND ADMINISTRATIVE HOURS BY SPECIALTY

Specialty	Number of hours worked in a week (US)	Number of hours spent on Administrative Work in a week (US)	Proportion of Time Spent on Administrative Work (US)	Proportion of Time Spent on Administrative Work (PR)	Difference (PR-US)
Primary Care	**48.8**	**16.0**	**33%**	**30%**	**-3%**
General/Family Practice	48.0	17.0	35%	30%	-5%
Geriatrics	50.0	15.5	31%	30%	-1%
Internal Medicine	51.0	18.0	35%	30%	-5%
OB/GYN	53.9	15.0	28%	30%	2%
Pediatrics	47.0	15.0	32%	30%	-2%
Physician Assistant	43.0	15.5	36%	35%	-1%
Specialists	**51.9**	**15.3**	**29%**	**32%**	**3%**
Cardiology	56.2	16.0	28%	32%	4%
Endocrinology	48.9	16.0	33%	32%	-1%
Gastroenterology	52.3	13.0	25%	32%	7%
Nephrology	54.9	18.0	33%	32%	-1%
Neurology	53.0	18.0	34%	32%	-2%
Oncology	52.6	18.0	34%	32%	-2%
Ophthalmology	45.3	10.0	22%	32%	10%
Orthopedics	52.9	14.0	26%	32%	6%
Psychology and Psychiatry	46.6	16.0	34%	35%	1%
Pulmonology	53.3	15.5	29%	32%	3%
Rheumatology	47.2	15.5	33%	32%	-1%
Surgery	57.4	15.0	26%	32%	6%
Urology	54.7	14.0	26%	32%	6%
Nurse	**41.3**	**16.5**	**40%**	**41%**	**1%**
Physical Therapy	**49.9**	**19.0**	**38%**	**35%**	**-3%**
				Average Difference:	**1%**

Note: Average used

Sources

https://www.whitecoatinvestor	Physician Hours
https://www.ncbi.nlm.nih.gov/	Nurse Hours
https://bhw.hrsa.gov/data-rese	PA Hours
https://www.billingparadise.co	Physician Admin
https://www.aacn.org/blog/nu	Nursing Admin Hours

The comparison shows only minimal differences in patient volume and administrative workload between the U.S. and Puerto Rico. Assuming the surveyed response on workload reflects the overall population of primary care and specialty care practitioners in Puerto Rico, we did not apply bandwidth adjustments to the model. However, we must note it is probable that survey respondents tended to overstate patient volume and understate administrative burden, particularly given how they responded to qualitative questions regarding these two topics.

Challenges with Workforce Coverage in Inpatient and Home Settings

By drawing from service utilization data, our model incorporated the distribution of care provided by certain healthcare practitioners across care settings (i.e. practitioner office, hospital inpatient, hospital outpatient, emergency department) to evaluate how this distribution compared to benchmarks and whether recommendations related to encouraging care in certain places of service were warranted. Based on our analysis, the vast majority of care delivered by these practitioners occurs at an office/clinic. PCPs spend approximately 93 percent of their time in outpatient care, while most SCPs (excluding surgeons and nephrologists), spend approximately 90 percent of their time in outpatient care. In addition, only a third of physicians stated they provide on-call medical services in hospitals, with specialists being more likely to provide these services.

By contrast, according to the Association of American Medical Colleges (AAMC) 2019 National Sample Survey of Physicians (NSSP)[10] physicians spend 80 percent of their direct patient care time providing ambulatory care, 9 percent providing inpatient care, 6 percent providing urgent care, and the remaining 5 percent providing care in nursing homes and assisted-living facilities, emergency departments, and other settings.

Refer to Exhibits 3G, 3H and 3I for more details.

EXHIBIT 3G: SERVICE PROVISION BY HEALTHCARE PRACTITIONER CATEGORY AND CARE SETTING

Provider Type	Office	Inpatient	Outpatient	ED
General/Family Practice	93.45%	1.17%	0.32%	5.06%
Internal Medicine	89.44%	9.00%	0.51%	1.04%
Pediatrics	75.37%	11.68%	7.46%	5.49%
OB/GYN	92.73%	4.55%	0.62%	2.10%
Surgery	73.33%	18.38%	7.14%	1.15%
Cardiology	88.11%	9.49%	2.13%	0.27%
Endocrinology	92.65%	7.32%	0.02%	0.00%
Gastroenterology	90.25%	4.49%	5.19%	0.07%
Geriatrics	98.27%	1.17%	0.36%	0.20%
Nephrology	70.31%	29.00%	0.64%	0.04%
Oncology	97.21%	2.41%	0.36%	0.02%
Pulmonology	83.61%	15.72%	0.65%	0.02%
Rheumatology	99.21%	0.38%	0.41%	0.01%
Psychology and Psychiatry	97.84%	0.68%	1.20%	0.28%
Neurology	88.21%	10.51%	1.05%	0.24%
Orthopedics	82.03%	9.19%	8.29%	0.48%
Urology	90.97%	5.64%	3.07%	0.32%
Physical Therapy	95.32%	4.06%	0.58%	0.04%
Ophthalmology	99.31%	0.27%	0.37%	0.06%

Source: Puerto Rico MMM, Triple S, MCS, and Humana Claims data (2023)

[10] https://www.aamc.org/media/44241/download

EXHIBIT 3H: AVERAGE TIME SPENT BY CARE SETTING, PRIMARY AND SPECIALTY CARE PRACTITIONERS

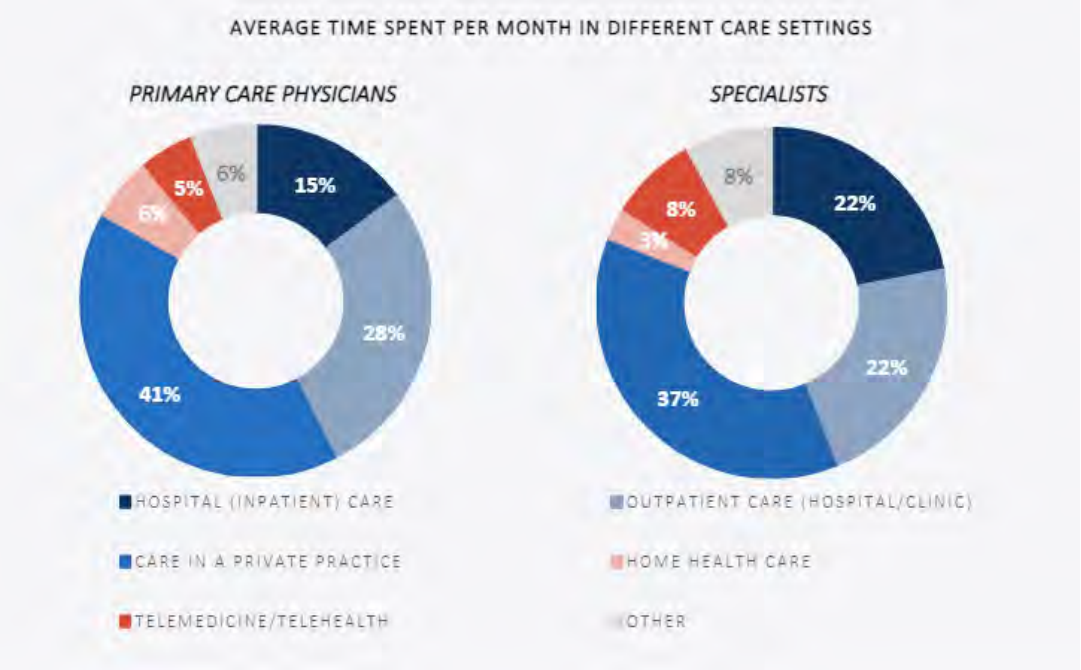
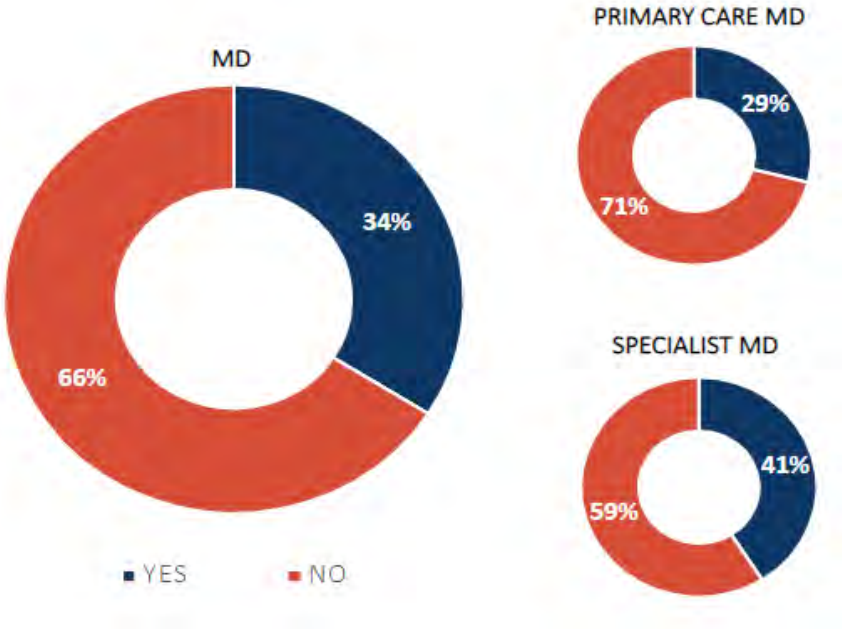


EXHIBIT 3I: PHYSICIAN ACCESS FOR ON-CALL MEDICAL SERVICES AT HOSPITALS



CHALLENGES WITH WORKFORCE COVERAGE IN CERTAIN REGIONS OF PUERTO RICO

The model also analyzed healthcare practitioner data based on service location and practice region. Appendix D presents detailed findings by practitioner category. In summary, across all practitioner types there is a projected widening of the gap between supply and demand over time, driven by demographic shifts and increased demand for services, which is more acute in the more rural regions of Puerto Rico. In the case of SCPs, the model shows a larger gap in the regions of **Mayaguez, Arecibo and Ponce**. For example, 53 percent of the gap for gastroenterologists, 60 percent of the gap for endocrinologists and 55 percent of the gap for orthopedists is concentrated in those three regions, creating critical access issues for residents of those regions (see Exhibit 3J, 3K, and 3L).

EXHIBIT 3J: GASTROENTEROLOGY GRAPHICAL OUTPUTS – 2024 GAP BY REGION

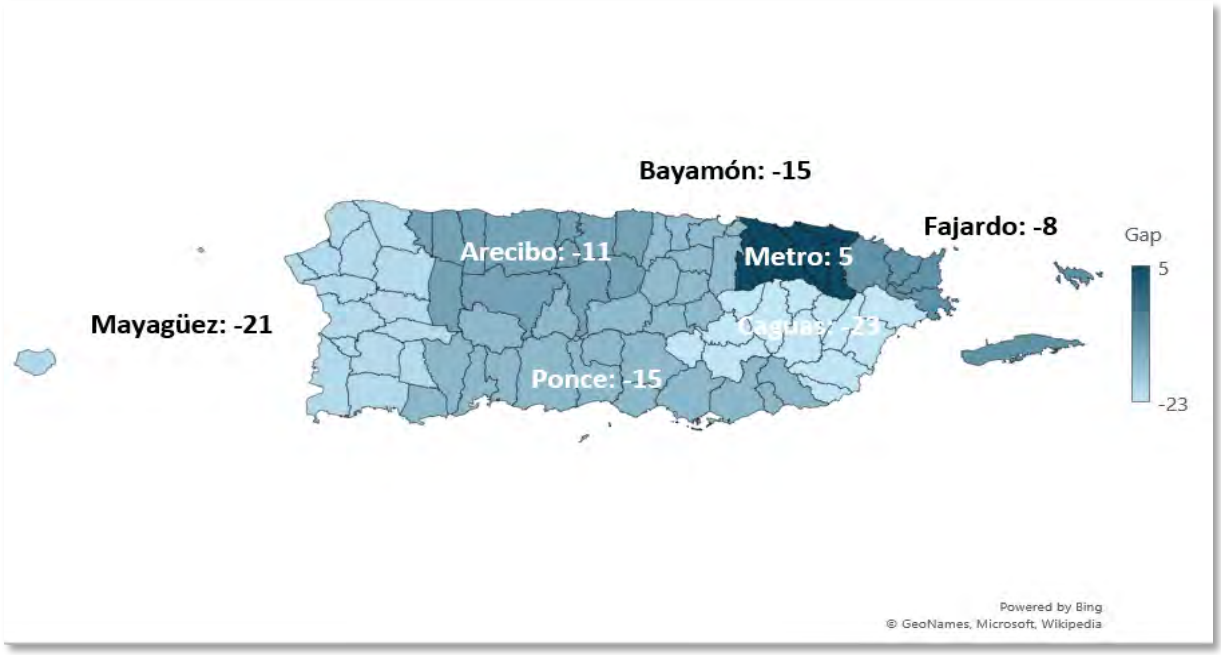


EXHIBIT 3K: ENDOCRINOLOGIEST GRAPHICAL OUTPUTS – 2024 GAP BY REGION

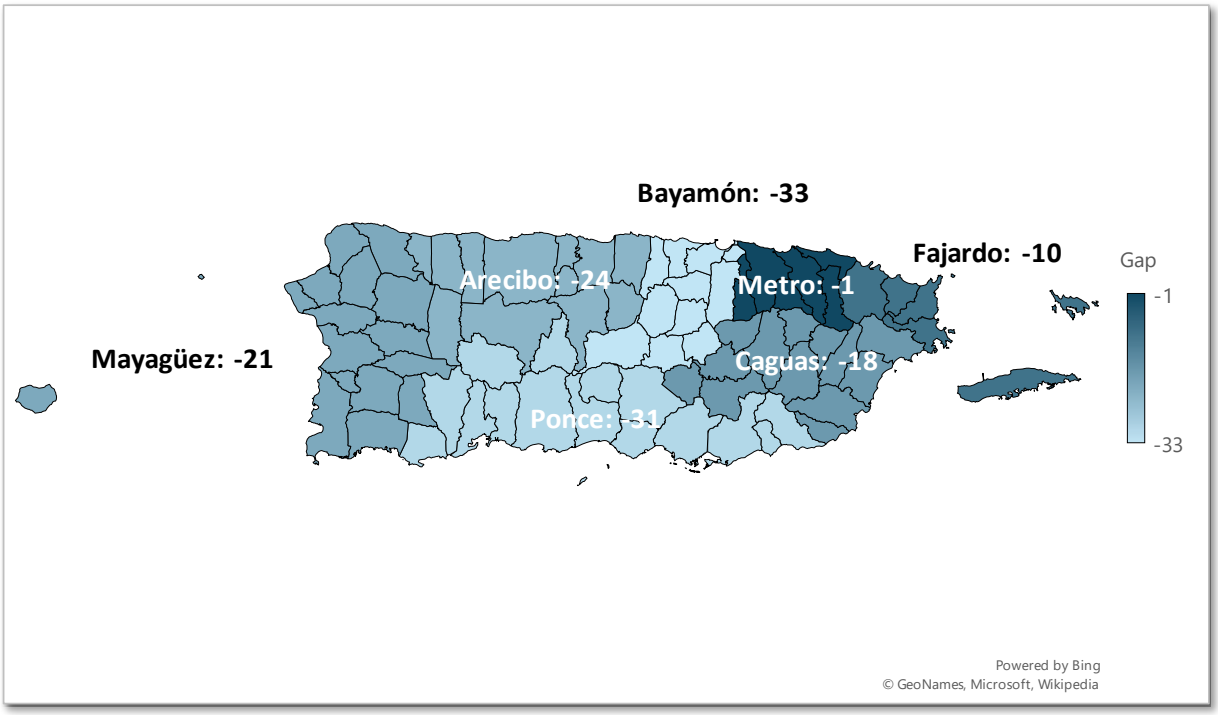
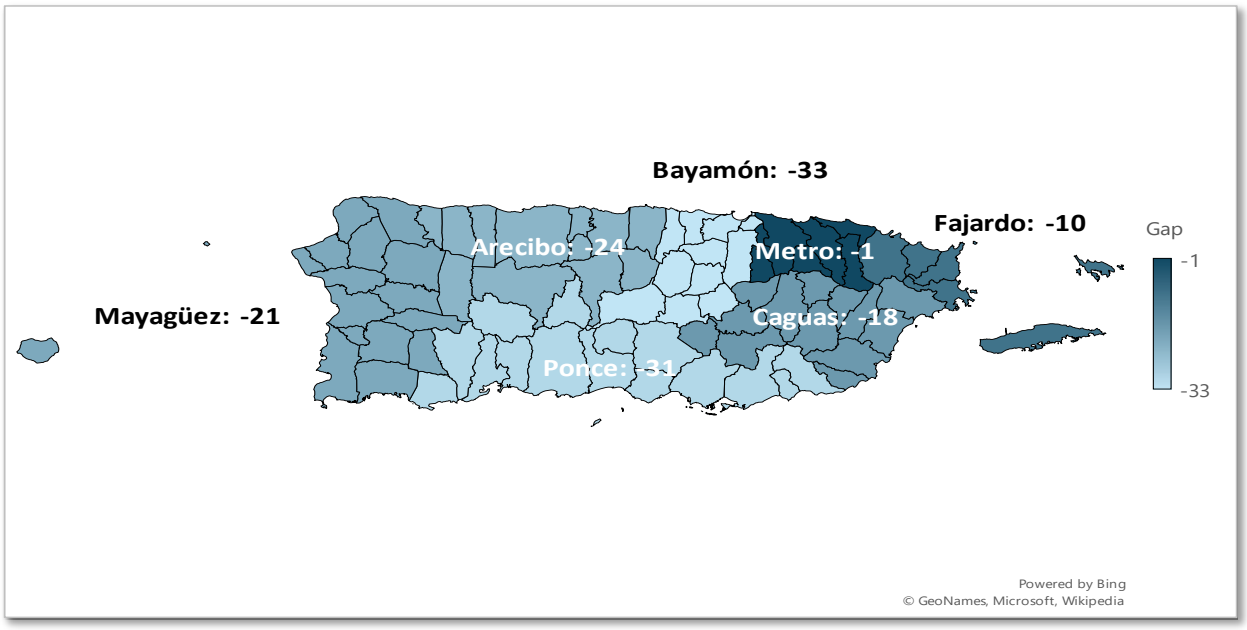
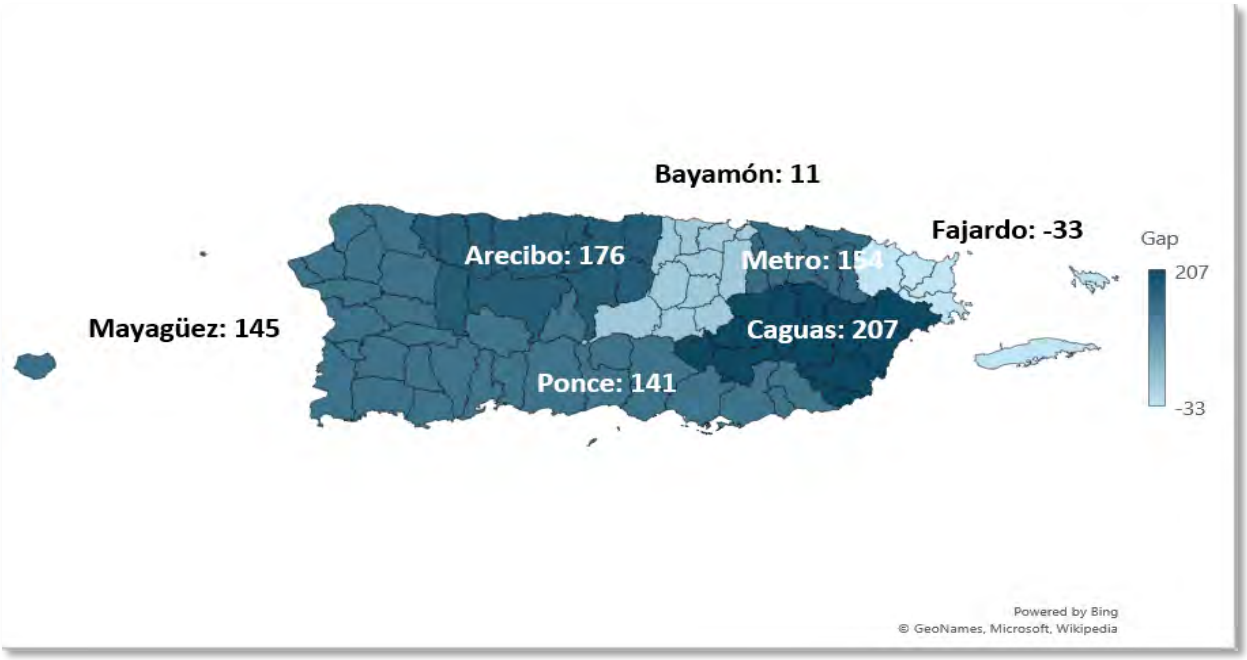


EXHIBIT 3L: ORTHOPEDICS GRAPHICAL OUTPUTS – 2024 GAP BY REGION



In the case of PCPs, there are significant gaps in the **Fajardo** region (see Exhibit 3M).

EXHIBIT 3M: GENERAL PRACTICE GRAPHICAL OUTPUTS – 2024 GAP BY REGION



4. Findings – Healthcare Workforce Demand Drivers

This section details key findings as derived from all study components – workforce profile, key informant interviews, survey, model – regarding the following:

- Factors that are placing particular pressure on the need for certain types of professionals: demographic, population health, social risk, accessibility to the professionals and the services they offer, service cost, infrastructure, cultural, etc.
- Trends and expectations regarding these factors
- Comparisons to benchmarks – per the model and how it was constructed, and any supplemental research

Throughout this section, we will call out findings that may not align with "conventional wisdom" – general assumptions and beliefs about healthcare workforce demand drivers that are not supported by our analysis.

DEMAND-SPECIFIC FINDINGS

In the model we utilized authoritative federal data for Puerto Rico, primarily from the U.S. Census Bureau, as foundational population data. We used that data to forecast **future demographic trends**. These projections are segmented by age group, county, and region, providing a granular understanding of the evolving population dynamics in Puerto Rico. We then forecasted workforce demand by using U.S. mainland demand for comparable workforce categories as a reasonable benchmark. Given the unique healthcare landscape of Puerto Rico, the model was adapted to account for factors like specialty shortages and differing age profiles and disease patterns to conduct a tailored, relevant assessment.

High Prevalence of Chronic Diseases

Data from the Behavioral Risk Factor Surveillance System (BRFSS) shows that Puerto Rico faces a **growing crisis with chronic diseases** such as diabetes, hypertension, and asthma, which are already at the **highest incidence rates in the United States**. The healthcare system struggles to manage these conditions due to significant barriers to access, resulting in worsened health outcomes for patients and increased demand for healthcare services. Informants emphasized that many patients, particularly those with chronic conditions, experience delays in receiving care, and the lack of early intervention causes their health to deteriorate requiring more care.

This situation creates a cycle where patients are mostly receiving care after their conditions have worsened, often requiring more intensive—and expensive—treatments. The rise in chronic illness is unsustainable, as patients arrive at hospitals and specialists in worse health, contributing to an overburdened healthcare system. The inability to access timely care leads to higher morbidity rates, overwhelming the system and increasing pressure on healthcare providers who are already stretched thin.

Without addressing these access issues, the burden of chronic diseases can continue to grow, further straining Puerto Rico's healthcare resources. **Earlier interventions** and **more consistent care** are crucial to preventing this negative spiral, but the system's inefficiencies make it difficult to meet the growing demand. As one informant observed, "The delays in care and lack of follow-up are driving a significant portion of the population into worse health, which in turn places even greater strain on the healthcare infrastructure."

According to the U.S. Centers for Disease Control, chronic conditions and mental health account for approximately 90% of total health expenditures[11]. If we assume the situation is, at worse, similar in Puerto Rico the inevitable conclusion is that increases in chronic condition prevalence are financially unsustainable.

[11] https://www.cdc.gov/pcd/issues/2024/23_0267.htm

EXHIBIT 4A: PREVALENCE OF MAJOR CONDITIONS, PUERTO RICO VS UNITED STATES

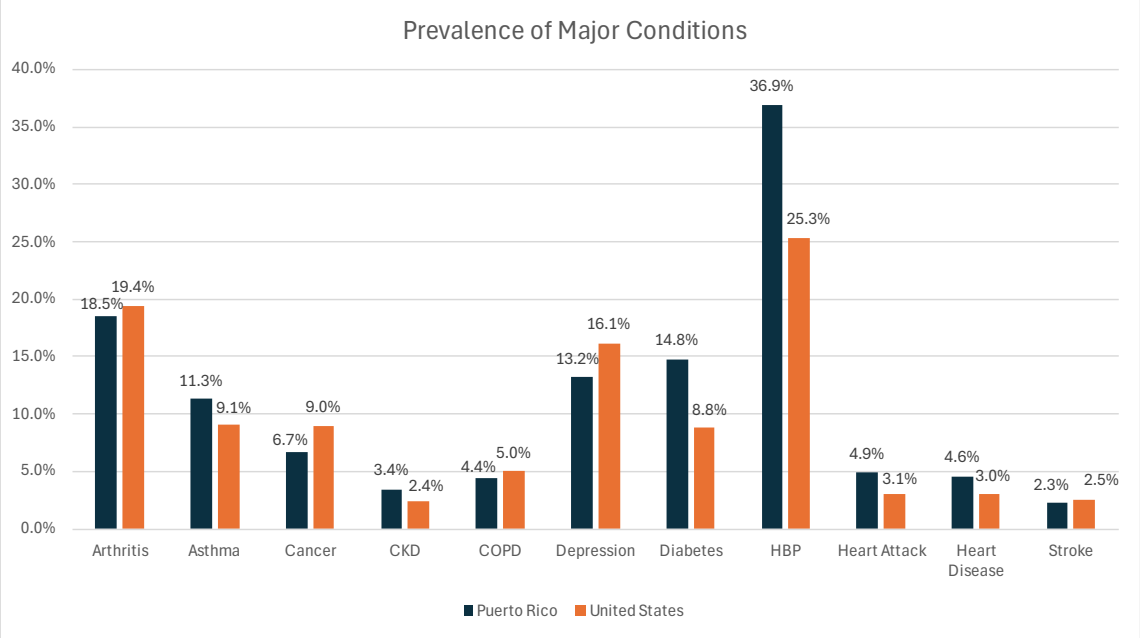


EXHIBIT 4B: PUERTO RICO PREVALENCE BY COMORBILITY BY YEAR

Puerto Rico Prevalence by Comorbidity and Year						
	2024	2030	2035	2040	2045	2050
Arthritis	19.0%	20.3%	21.1%	21.8%	22.5%	23.1%
Asthma	11.3%	11.2%	11.1%	11.0%	11.0%	11.0%
Cancer	6.9%	7.4%	7.7%	8.0%	8.2%	8.4%
CKD	3.5%	3.8%	4.0%	4.1%	4.3%	4.4%
COPD	4.5%	4.7%	4.8%	5.0%	5.1%	5.2%
Depression	13.3%	13.4%	13.4%	13.5%	13.6%	13.8%
Diabetes	15.1%	16.1%	16.6%	17.1%	17.6%	18.0%
HBP	37.6%	39.4%	40.5%	41.5%	42.3%	43.2%
Heart Attack	5.0%	5.4%	5.6%	5.8%	6.1%	6.3%
Heart Disease	4.7%	5.0%	5.3%	5.5%	5.7%	5.8%
Stroke	2.4%	2.8%	2.9%	3.1%	3.3%	3.4%

Following is more perspective on two chronic conditions – diabetes and hypertension – that are major drivers of **potentially avoidable** workforce demand for which we make specific recommendations later in the report.

Diabetes

Puerto Rico's diabetes prevalence - 15.1 percent - exceeds the national U.S. rate of 11.3 percent. The disparity reflects both demographic and health system differences, with Puerto Rico facing unique challenges in healthcare access and preventive care compared to the mainland U.S. Contributing factors include high rates of obesity, physical inactivity, and socioeconomic challenges, alongside genetic predisposition in the Hispanic/Latino population. The model projects that diabetes prevalence will increase to almost 18 percent in the next 25 years. Refer to Exhibits 4C and 4D for more details.

EXHIBIT 4C: PUERTO RICO DIABETES PREVALENCE OVER TIME

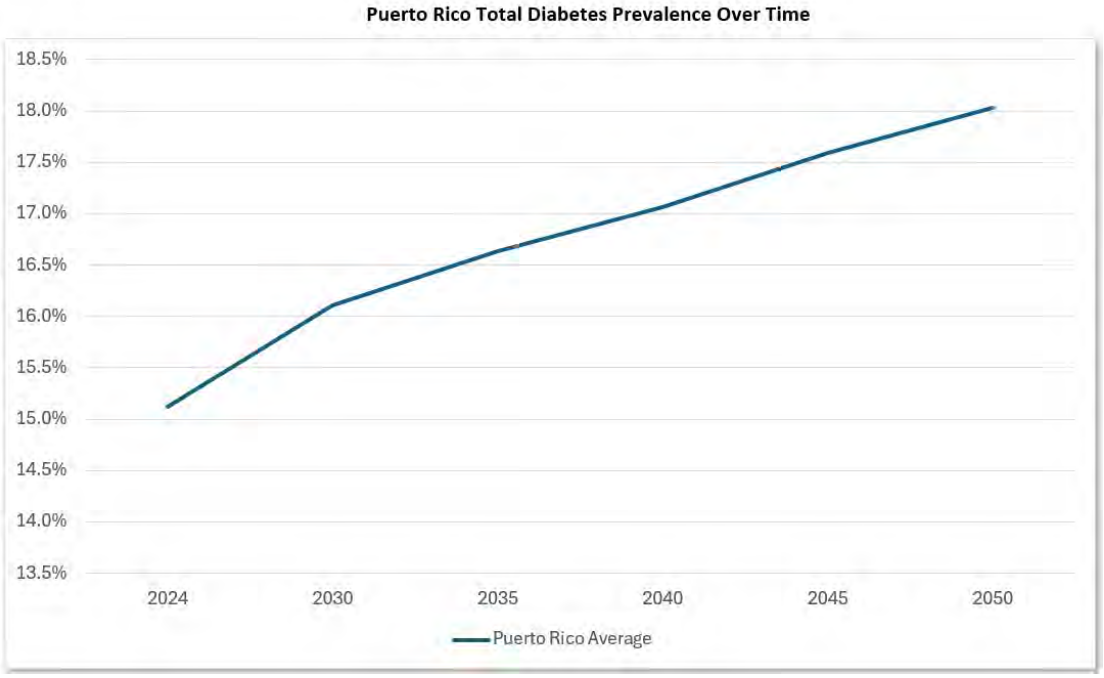
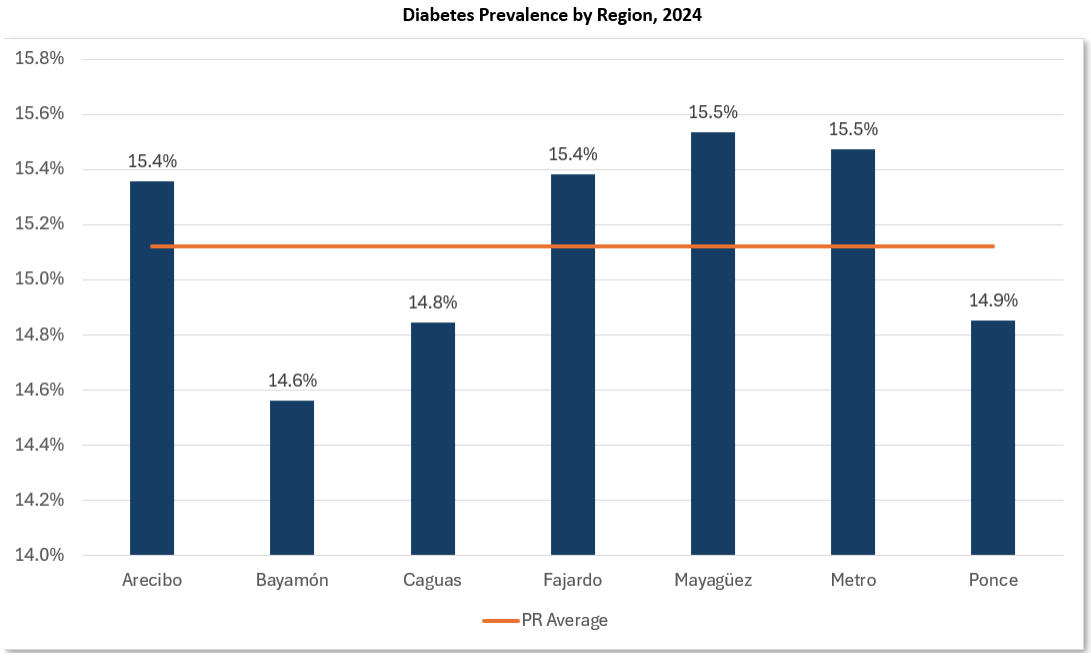


EXHIBIT 4D: PUERTO RICO DIABETES PREVALENCE BY REGION

Diabetes Prevalence by Region						
Map Data	2024	2030	2035	2040	2045	2050
Arecibo	15.4%	16.3%	16.8%	17.2%	17.7%	18.2%
Bayamón	14.6%	15.5%	16.0%	16.5%	17.0%	17.4%
Caguas	14.8%	15.8%	16.3%	16.7%	17.2%	17.6%
Fajardo	15.4%	16.4%	17.0%	17.4%	18.0%	18.4%
Mayagüez	15.5%	16.6%	17.1%	17.6%	18.1%	18.5%
Metro	15.5%	16.5%	17.1%	17.5%	18.1%	18.5%
Ponce	14.9%	15.8%	16.3%	16.7%	17.2%	17.7%



Hypertension/High Blood Pressure

According to the CDC, about 47 percent of U.S. adults (roughly 116 million people) suffer from hypertension/high blood pressure (HBP). High blood pressure is more common in older adults, non-Hispanic Black individuals and men, but affects all populations. In Puerto Rico, the prevalence of high blood pressure is even higher, with prevalence estimates of at least 48 percent of adults. As in the mainland U.S., hypertension rates in Puerto Rico are driven by factors such as obesity, high salt intake, low levels of physical activity, and genetic predispositions within the Hispanic/Latino population. The prevalence reflects shared risk factors across the U.S. and Puerto Rico, but Puerto Rico's healthcare system and socioeconomic conditions may exacerbate challenges in managing and controlling HBP. Refer to Exhibits 4E and 4F for more details.

EXHIBIT 4E: PUERTO RICO HIGH BLOOD PRESSURE OVER TIME

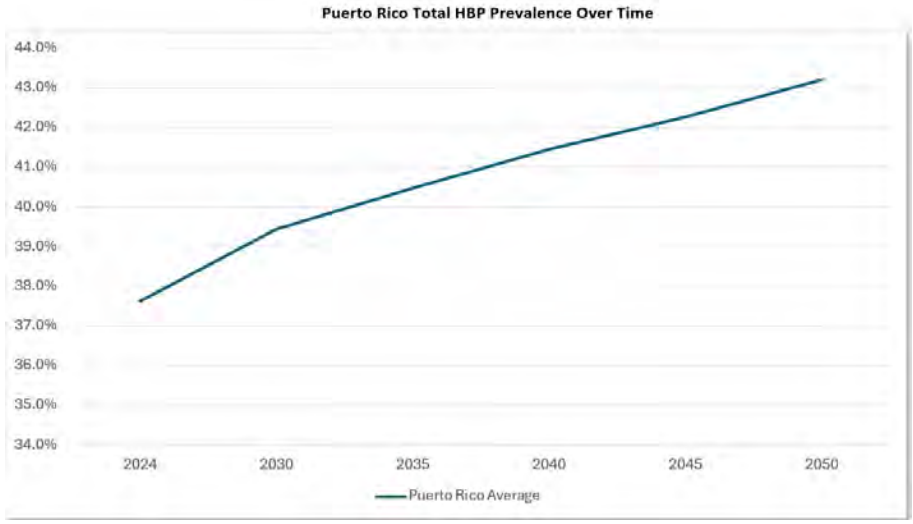
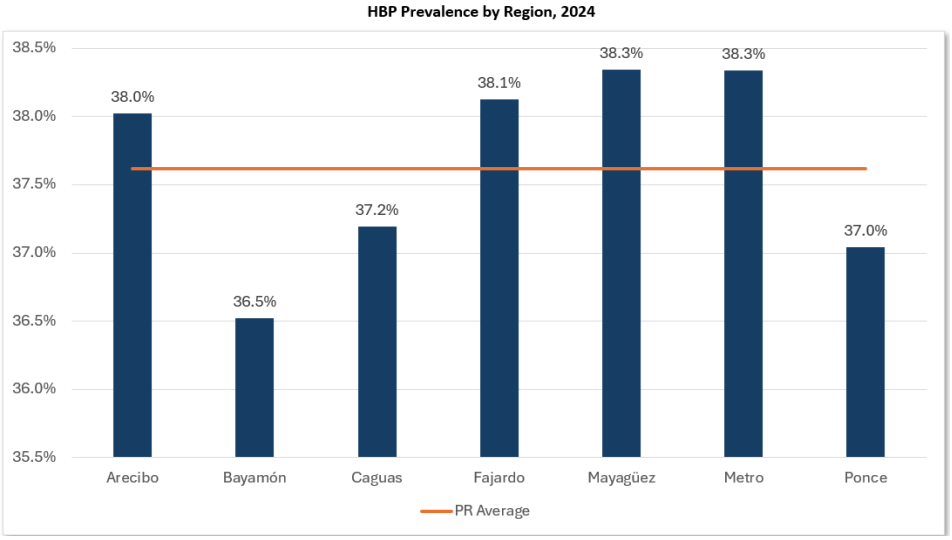


EXHIBIT 4F: PUERTO RICO HIGH BLOOD PRESSURE BY REGION OVER TIME

HBP Prevalence by Region						
Map Data	2024	2030	2035	2040	2045	2050
Arecibo	38.0%	39.8%	40.8%	41.7%	42.5%	43.4%
Bayamón	36.5%	38.3%	39.3%	40.3%	41.1%	42.0%
Caguas	37.2%	38.9%	39.9%	40.8%	41.6%	42.5%
Fajardo	38.1%	40.0%	41.2%	42.2%	43.0%	44.0%
Mayagüez	38.3%	40.3%	41.4%	42.4%	43.1%	44.0%
Metro	38.3%	40.2%	41.4%	42.4%	43.3%	44.2%
Ponce	37.0%	38.8%	39.8%	40.7%	41.5%	42.4%



Program/Benefit Design Drivers

There was considerable agreement among stakeholders interviewed and surveyed that the financial imbalance that Puerto Rico faces in its federal healthcare programs vis-à-vis states has created a negative impact in the population's health conditions and an increase in demand for services. Without a system in place to address the needs of aging populations or individuals with disabilities, many patients are left without adequate support for their long-term health conditions. This leads to increased reliance on acute healthcare services such as emergency care and hospitalizations, which can strain national healthcare systems. The absence of preventive, ongoing, and supportive care results in the worsening of chronic diseases, making conditions harder to manage and more costly to treat in the long run.

Moreover, in the absence of long-term services and supports infrastructure, families and informal caregivers bear a disproportionate burden of care, often without proper training or resources. This can lead to gaps in care, delayed interventions, and missed opportunities to manage chronic conditions effectively. As a result, patients are more likely to suffer from complications, requiring more intensive healthcare interventions. Countries with inadequate long-term services and supports infrastructures also tend to see higher incidences of chronic diseases like diabetes, cardiovascular diseases, and arthritis, as individuals lack the continuous care needed to manage these conditions.[12]

Financial Incentive Misalignment

During the interview process, the topic of tax incentives to healthcare workers (Law 14) was mentioned as a key driver of supply. Some stated that it was critical to incentivize the return of physicians who completed their residency outside of Puerto Rico. Others said it was important to retain healthcare professionals who were being recruited aggressively by organizations in the U.S.. The data showed that there was an increase in licensed providers from 2019 through 2024 (see table below). However, physicians interviewed during the survey stated that 92 percent of the physicians that received the tax incentive benefit were already residing in Puerto Rico

In addition, several key informants stated that physicians who received the tax incentive did not expand their capacity to see more patients, but rather reduced their hours of operation presumably because they were able to generate the same net income working less after accounting for the tax incentive. The analysis of responses to survey questions designed to gage whether this phenomenon was occurring was inconclusive, but because of study limitations the sample size for these questions was small. We believe this hypothesis warrants further study.

Finally, there are concerns regarding the unintended consequences of increasing GHP reimbursement rates for certain services. Purportedly these increases were designed to remedy long-standing issues with the adequacy of reimbursement for those services; moreover, those reimbursement increases were federally mandated. That notwithstanding, we heard from numerous key informants that this increase – which was setting GHP reimbursement rates above Medicare and commercial insurance – was having two serious detrimental effects:

- It was driving physicians to prioritize treating GHP beneficiaries and, as a result, Medicare and commercial insurance subscribers were experiencing major accessibility constraints.
- It was putting pressure on Medicare Advantage and, especially, commercial insurance premiums - in the absence of increased supply of healthcare practitioners, these individuals were negotiating higher fees from those insurers.

For context, in the U.S. Medicaid reimbursement rates for professional services average approximately 78 percent of Medicare reimbursement[13], whereas Medicare reimbursement averages approximately 72 percent of commercial insurance reimbursement[14].

[12] https://www.cdc.gov/pcd/issues/2024/23_0267.htm

[13] https://www.acr.org/Practice-Management-Quality-Informatics/ACR-Bulletin/Articles/June-2023/Medicaid-Reimbursement-Is-Not-Keeping-Pace-With-Medicare#:~:text=In%20general%2C%20Medicaid%20reimbursement%20rates,about%2078%25%20of%20Medicare%20reimbursement.&text=Further%2C%20the%20rates%20vary%20substantially%20across%20states%20and%20for%20specific%20procedures.

[14] https://www.milliman.com/en/insight/commercial-reimbursement-benchmarking-payment-rates-medicare-fee-for-service#:~:text=Nationally%2C%20we%20estimate%202023%20commercial,as%20shown%20in%20Figure%201.

Inadequate Infrastructure

Inevitably, the unavailability of certain services will drive up demand and widen the associated demand-supply gap in other categories of service. For instance, when specialty care or preventive services are limited, patients may seek more general services or rely on emergency departments and primary care practitioners for conditions that could have been managed in a more cost-effective care setting, increasing the burden on more costly care settings designed for treating more severe conditions or injuries. The ripple effect strains already limited resources and can lead to delayed diagnoses, longer wait times, and higher healthcare costs, exacerbating disparities in access to care.

5. Findings – Healthcare Workforce Supply Drivers

This section details key findings as derived from all study components – workforce profile, key informant interviews, survey, model – regarding the following:

- Factors that are placing particular pressure on the **counts**, **availability**, **operational capacity** and **accessibility** of certain types of healthcare professionals
- Trends and expectations regarding these factors
- Comparisons to benchmarks

Throughout this section, we call out findings that may not align with "conventional wisdom" – general assumptions and beliefs about healthcare workforce supply drivers that are not supported by our analysis.

Complex Interplay of Factors That Impact Workforce Demand and Supply

Before elaborating on workflow supply drivers, we believe it is important to discuss the interplay between workforce demand and supply drivers. During our key informant interviews, interviewees discussed that the misalignment between workforce demand and supply identified through our model is driven by multi-prong, interrelated factors:

- The workforce that is graduating out of various programs - medical, nursing, allied health, administration, support - across the board is not as aligned as it needs to be to effectively address demand, particularly **future** demand. In our opinion the recent focus of these programs has been to address demand which may be critical in the shorter term, or in response to an apparent (not necessarily quantified) gap between supply and demand. Example: proliferation of nursing programs across Puerto Rico and the opening of new primary care residencies.

- In our opinion, and based on input from key informants, there are many "cooks in the kitchen" influencing or making decisions about workforce development programs, and on occasion certain interests which may be well-intentioned but not positioned to consider the "bigger picture" win out. We are also aware of multiple programs, particularly programs sponsored by hospitals and health insurance companies, that are focused on the same category of professional which may or may not be the greatest need. For example, the Triple S Foundation established a scholarship program for orthopedics, neurology and pediatrics residents – based on our model, only orthopedics is experiencing a significant demand-supply gap.[15]

- Numerous concerns were expressed about the quality and effectiveness of some of the education and training programs. In response to that, some professionals seeking a more complete education pursue programs in the U.S.; alternatively professionals with the more complete education become targets of health insurance companies and U.S. organizations.

- Numerous concerns were also noted about the extent to which professionals - especially physicians and nurses - are able to cover hospital-based demand. Based on inferences from the interviews and the survey, there are multiple causes for that: payment inadequacy, resistance to work long or late hours which could be partly safety-based, the work burden they are already carrying, opportunities to work in different roles (especially true for nurses), and too many hospitals trying to tap into the same constrained pool of resources.

- Finally, interviewees provided multiple examples of mismatches between training and actual skills and capabilities.

With these overarching observations as context, following are findings specific to workforce supply drivers.

[15] https://www.fcpr.org/wp-content/uploads/2024/04/Guia-2024-Fondo-Triple-S-Final-1.pdf

DEFICIENT PIPELINE

Collected narratives indicate that creating a pipeline of students interested in health care professions is a major barrier in Puerto Rico due to the lack of structured pathways and role models available to high school students. This limitation restricts early exposure to health careers, which is crucial for inspiring students to pursue professions in this field.

Limitations in Medical Schools, Residency and Fellowship Programs

Compared to other jurisdictions, Puerto Rico has a limited amount of medical schools, residency and fellowship programs that allow for college students to have the option of entering the field.

Hospital GME training site financial challenges have led to the closure of residency programs, further reducing the number of available training positions and further exacerbating healthcare workforce shortages. "*We had to close a residency program because the hospital couldn't sustain the financial burden*," shared one participant in the interview process, highlighting a cycle where fewer residency positions lead to fewer trained physicians, worsening the overall shortage.

Expanding medical school enrollment, residency programs, and fellowships in Puerto Rico also faces significant hurdles, including difficulty recruiting and retaining faculty, the locations of schools which makes it difficult for students to commute to and from the facilities, and outdated learning and training resources and tools. All these factors hinder the development and expansion of medical education programs. In addition, the island's hospitals often lack needed state-of-the-art facilities and technology to train residents in the most recent innovations, limiting opportunities for growth.

The student/resident survey highlighted the fact that, even though 74 percent of respondents said they feel their programs are preparing them for the future, 26 percent rated the program as adequate/not good/poor driven by student complaints about lack of academic strength, lack of clinical opportunities and training (especially in the emergency room and intensive care units), and not feeling that they are a priority to administrators.

LOWER RECRUITMENT INCENTIVES AND POOR RETENTION

The lower remuneration and incentives that healthcare professionals in Puerto Rico receive contribute to a significant drainage of talent to the United States after graduation and while working. This reality underscores the disparity in salaries between Puerto Rican and U.S. healthcare professionals, and the active recruitment efforts by U.S. health organizations that further pull them out of the island.

During the interviews, participants repeatedly emphasized that physicians in Puerto Rico earn significantly less than their counterparts in the U.S. This wage gap is a critical factor driving the migration of doctors from Puerto Rico to the mainland United States. As one participant highlighted: "*It's disheartening to see that after years of education and training, our doctors are paid a fraction of what they would earn in the U.S. This wage disparity is pushing our best talent away*."

The issue of low salaries is not limited to physicians. Nurses and allied health professionals in Puerto Rico also face substantial pay gaps when compared to similar professions both locally and in the U.S. Participants noted that nurses and allied health professionals are paid salaries that are similar to those that they would earn working at a beauty salon or in retail, which they considered less “stressful” jobs.

DISPROPORTIONATE ADMINISTRATIVE BURDEN

Puerto Rico’s healthcare system seems to face significant market inefficiencies that exacerbate its workforce challenges. One of the most pressing issues identified is the excessive amount of time physicians spend on administrative tasks. Based on survey responses, physicians in Puerto Rico spend, on average, **32 percent** of their time on paperwork and navigating complex payment policies. This was cited by numerous healthcare professionals as a major cause of burnout. As one interviewee shared: "*The amount of paperwork required by the insurance companies is overwhelming. It takes time away from our patients, and it feels like we're just ticking boxes instead of practicing medicine.*" **This administrative burden appears to detract from the time physicians spend with patients, reducing access and contributing to job dissatisfaction and burnout.**

Additionally, informants cited the unpredictable and often complex nature of payment policies which create financial instability for healthcare providers. As another interviewee noted: *"The unpredictability of payment policies is one of the most frustrating aspects of dealing with insurance companies. We can't build a stable financial plan when we're constantly dealing with changes in how and when we get paid."* The complexity of Puerto Rico's reimbursement process, compounded by lower reimbursement rates than those in the mainland U.S., makes it difficult for providers to cover operational costs. Even though the requirements may be like those in the States, in Puerto Rico providers do not count on the financial resources to hire additional team members to manage the administrative complexities. This situation places added financial pressure on healthcare professionals, forcing them to navigate an already administratively burdensome system without adequate resources.

Informants and survey respondents also noted the challenges they have recruiting and retaining personnel that provides functional and other supports within their healthcare organizations – these supports include scheduling, registration, medical records, billing, and even janitorial services and security. In the absence of having sufficient personnel to handle these functions reliably, practitioners are forced to take on some of those functions which adversely impacts their availability and operational capacity.

Healthcare Service Delivery Fragmentation and Suboptimal Use of Certain Services

Particularly when compared to other jurisdictions, Puerto Rico's healthcare service delivery is **highly fragmented**, lacking the coordination across primary care practitioners, specialty care practitioners, hospital-based personnel and, where applicable, payer resources – which often has to occur in real time – required for efficient care delivery, avoidance of complications and safety issues, and optimal use of constrained healthcare professionals. . Informants indicated that Puerto Rico operates under a very siloed "system", where different parts of the healthcare ecosystem function independently. This disjointed structure not only makes it harder for patients to access the care as they circle in and out of different systems trying to manage their own care, but it also increases the strain on the already overburdened healthcare workforce because it creates unnecessary redundancies and ineffective care.

One of the major consequences of this fragmentation is the **overuse of emergency rooms**. Many patients unable to secure timely appointments with specialists turn to ERs, which are not geared towards managing chronic conditions as in an organized primary care visit. As a result, while patients are seen by a physician, their underlying health issues often go untreated. An informant explained, *"To get an appointment, we are so saturated that the next available slot might be in six months. Patients end up going to emergency rooms, which overcrowds the hospital system."* Another interviewee added, *"Emergency rooms have become places for treating chronic conditions that could be managed with a visit to a doctor. But because doctor's appointments are so far out..."* This phenomenon is concerning because the doctor's valuable time is being spent, but the patient's chronic disease management need is not being addressed. Hospitals also report that patients arriving at ERs are in worse condition, and reimbursement for these services doesn't reflect the complexity of care. One informant shared, *"The type of patients coming to our hospitals is more complicated, and morbidity and mortality rates continue to increase."*

Following are two noteworthy statistics regarding emergency room use in Puerto Rico:

- According to the most recent National Hospital Ambulatory Medical Care Survey published by the federal Centers for Disease Control and Prevention (CDC), which covers the year 2021, the ER use rate in the U.S. ranged from 400 to 460 visits per 1,000 individuals depending on region[16]. During essentially the same period, per the GHP data book published in 2021[17], the ER use rate across all membership groups in the Government Health Plan – a program with extensive utilization controls – was **514 visits per 1,000 members**, almost 12 percent higher than in the U.S. region with the highest use rate.
- As noted in the same data book, approximately **47 percent of ER visits were deemed *non-emergent* or *potentially non-emergent*** based on a highly regarded algorithm developed by New York University.

[16] https://www.cdc.gov/nchs/data/nhamcs/web_tables/2021-nhamcs-ed-web-tables-508.pdf

[17] ASES Government Health Plan RFP Data Book, published in 2022 – memorandum and subsidiary tables

In addition to the ER use issue, inefficiencies tied to **potentially excessive referrals** were cited as further contributing to delays in care. Multiple referrals are sometimes required for preventive procedures like colonoscopies which are a preventive measure with clinical guidelines, creating unnecessary barriers for patients. One specialist noted, *"A colonoscopy could be done, and the results sent to me…but this requires three referrals [and physician visits], which complicates things."* These delays not only frustrate patients but also impact outcomes, especially in cases where early detection is critical, such as cancer diagnosis. As one informant pointed out, *"Cancers are being diagnosed later, and chemotherapy is often delayed, contributing to increased mortality."*

Information System and Information Management Challenges

Over the last fifteen years – since passage of the American Recovery and Reinvestment Act – tens of billions of dollars have been invested at the federal level, with billions of dollars invested by state and local governments and private sector organizations – in improvements in health information system functionality and interoperability. The ability to securely exchange critical information about patients in a timely manner, without the need to alter or manipulate the information to make it usable, and to leverage that information for diagnostic and treatment purposes, were deemed to be essential to "bending the healthcare cost curve" and increasing the operational capacity of healthcare professionals. When compared to the U.S. experience, the response from interviewees and individuals surveyed strongly suggests that Puerto Rico suffers from severe limitations in both healthcare information system functionality and interoperability.

We received numerous comments about the capabilities of health information systems, from electronic health records to care management and administrative systems, used in Puerto Rico in addition to the challenges securing and retaining qualified personnel to maintain and take full advantage of the functionality of these systems. Moreover, physicians in Puerto Rico are less likely than comparable U.S. physicians to employ electronic health record and practice management systems. According to data maintained by HHS, as of 2021 almost 79 percent of office-based physicians had adopted an electronic health record (EHR) system[18] which was certified by the federal government[19]. In Puerto Rico, according to preliminary data from a health information technology environmental scan conducted earlier this year by a DOH contractor, only 59 percent of physicians indicated that every physician in their offices uses EHR systems.[20] Several studies have documented the potential benefits of EHR systems – beyond administrative cost savings that can be realized from more streamlined operations and revenue cycle management, the use of EHR systems has been linked to improved clinical outcomes (e.g. improved quality, reduced medical errors) and broader societal benefits (e.g. improved ability to conduct population health analytics and research).

Informants and survey respondents also commented on the challenges trying to exchange health information electronically across providers. Puerto Rico does not have a functioning health information exchange (HIE), and even if an open Department of Health procurement is adjudicated this year based on our experience with similar projects it is not likely that a high-functioning HIE will be in place before 2026 at the earliest. Moreover, despite investments in health information system support resources, based on comments it appears many providers lack reliable supports in this area as well as resources that can train and help staff make optimal use of these systems. Finally, many of the vendors that supply these systems in Puerto Rico are local and do not have the same bandwidth to support all of the systems they have sold and implemented as the larger U.S.-based concerns.

Without higher levels of functionality and interoperability, the ability to coordinate care and ensure optimal use of constrained resources is seriously compromised, leading to waste, unnecessary procedures, and potential harm to patients. The inability to coordinate care and make more effective use of information places even more pressure on healthcare workers, who must deal with redundant procedures and other inefficiencies.

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[18] Generally these certified EHR systems incorporate health record and billing/revenue cycle management functionality.

[19] https://www.healthit.gov/data/quickstats/national-trends-hospital-and-physician-adoption-electronic-health-records#:~:text=As%20of%202021%2C%20nearly%204,physicians%20had%20adopted%20an%20EHR.&text=Measures%20of%20EHR%20adoption%20differ%20over%20time.

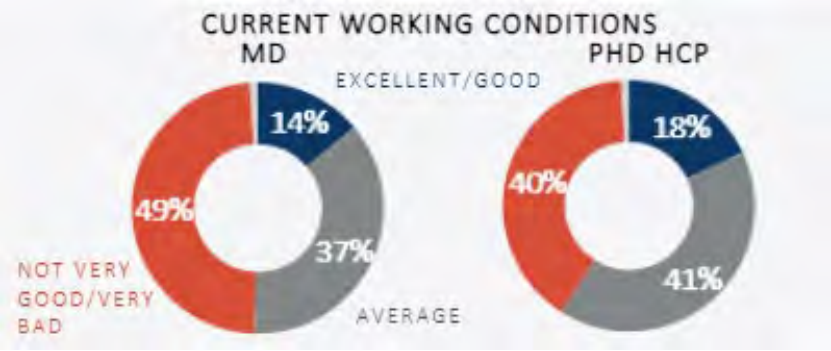
[20] Statistic provided by Impactivo, which participated in the cited HIT environmental scan.

Challenging Working Conditions

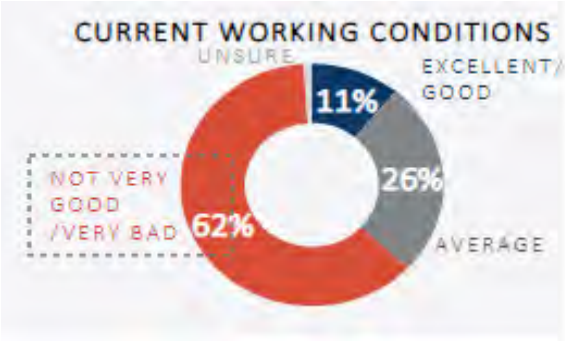
After experiencing the 2017 hurricanes, the 2019 earthquakes, the COVID-19 pandemic, and ongoing challenges in healthcare and Puerto Rico more broadly, most stakeholders interviewed and surveyed agreed that the healthcare workforce in Puerto Rico is experiencing severe burnout. In addition to the heavy workloads caused by low full-time equivalent (FTE) counts at many sites, the working conditions themselves contribute to ongoing chronic burnout. Survey respondents indicated a high percentage of burnout, low job satisfaction and a high percentage considered their working conditions not very good or bad; refer to Exhibit 5A.

EXHIBIT 5A: CURRENT WORKING CONDITIONS REPORTED BY HEALTHCARE WORKFORCE SURVEY RESPONDENTS

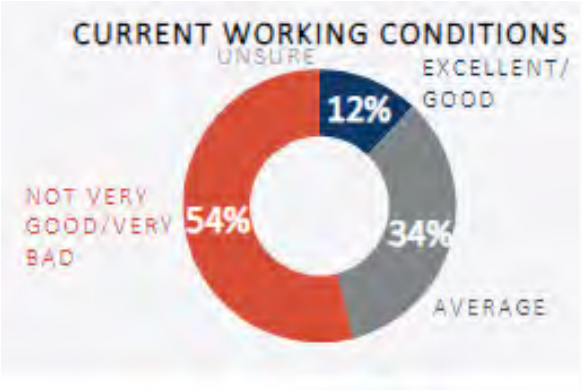
PHYSICIANS AND PRACTITIONERS WITH DOCTORATE DEGREES



NURSES



ALLIED HEALTH PROFESSIONALS



6. Synopsis of Major Findings

After documenting and analyzing the findings from the various study workstreams, the study's core advisory team convened to deliberate and reach consensus on the following major findings from the study; the recommendations that follow the summation of major findings are designed to address the findings:

1. **Serious misalignments exist between workforce demand and supply across multiple *healthcare professional* sectors**. The magnitude of the misalignment varies based on **demography**, **patient condition** and **geography**.

    - The largest gaps are seen in specialist providers critical to manage chronic conditions like diabetes, heart diseases and cancer.

    - Data shows a larger gap on healthcare workforce in areas outside of the metropolitan area, especially in Puerto Rico's West region.

    - There is also a critical issue with practitioners supporting care in inpatient settings. Claims data and survey results strongly suggest that doctors spend a smaller than expected percentage of their time providing services in the hospital setting (emergency room and Inpatient).

    - Key informant interviewees agreed that members of commercial health insurance are experiencing more acute access issues because of unintended consequences of increasing GHP payments.

2. Puerto Rico has an aging population as well as an **aging healthcare workforce**, both of which present major challenges. At the same time as demand for healthcare workforce is increasing because of an aging population, more than half of physicians age 60 and older, including almost two thirds of specialty care practitioners, indicated in their survey responses that they plan to retire within the next five years. This retirement phenomenon could create a supply "cliff" that would further compromise patient access to critical services.

3. There are **major deficiencies** in **allied healthcare workforce** critical to the support of providers and the management of a patient, especially during and after surgical procedures.

    - Examples of these include physical therapists (as determined through modeling), and respiratory therapists and other technical specialties like lab technicians (as inferred from key informant interviews and survey responses).

4. There are **deficiencies in healthcare workforce sectors** focused on ***functional supports***.

    - Examples of these include office/facility management, technicians, coding/health information management, billing/revenue cycle management, informatics, health information technology (HIT) support

5. There are **deficiencies in workforce sectors** that, while **not traditionally categorized as *healthcare* workforce sectors**, impact timely access to services and, as a result, put pressure on the existing healthcare workforce in a variety of ways.

    - Examples of these include security, janitorial/environmental services, transportation, child and elder care

6. There are **laws and regulations** that adversely impact healthcare workforce supply at a time when supply needs to be maximized.

- Example: Telehealth. Contrary to most states, which have reciprocity of licensing and specialty care practitioners are able to provide telemedicine services to patients, in the case of Puerto Rico current regulation does not allow for telehealth services to be provided to patients in Puerto Rico by practitioners that reside outside of Puerto Rico. This is the case **even if the practitioner is licensed in Puerto Rico** – the practitioner is required to provide telehealth services within Puerto Rico.

7. There are **care management and delivery inefficiencies** that generate overutilization of certain constrained resources and avoidable utilization of certain services when patient needs and problems are not managed timely or effectively.

    - Examples: multiple referrals, repeat tests and diagnostic procedures within the same episode of care, delayed authorizations, inconsistent post-discharge follow-up, limited access to post-operative therapy services, and – more broadly – limited interaction across practitioners treating the same patient in instances where the patient has multiple conditions and comorbidities.

8. There are numerous constraints to the **timely access to and use of health care information and systems**.

    - Examples: non-existent real-time health information exchange, limited interoperability across information systems such as electronic health records, inadequate flow of data from insurance companies and government agencies to providers

9. There are concerning **behaviors and cultures within certain workforce sectors** that adversely impact workforce supply. Examples cited in interviews included impairments to accessing hospital operating rooms and other resources, licensing board operations, and behaviors of certain medical organizations

10. There appear to be multiple **unintended consequences of certain (well-intentioned) policy initiatives**.

    - Examples: physician tax incentives impacting physician availability, Medicaid physician reimbursement creating significant differences in access across health coverage programs

11. There are concerns about the **quality of some education programs**, which may be contributing to patients not receiving appropriate, timely care which leads to more acute patients with more conditions that are harder to manage. This issue was raised particularly with regards to general medicine practitioners and some categories of nursing, where the levels of education and preparedness may not be equivalent to similar professions in the U.S.

12. The **high concentration of certain health care practitioners**, particularly medical specialists, **in the larger population centers** continues to exacerbate both availability and accessibility challenges

13. There are numerous well-documented **funding constraints** that have direct bearing on workforce supply:

- The disparity between federal Medicaid funding available to Puerto Rico and that which would be available to a state of comparable population, in conjunction with the disparity in Medicare funding, have severely limited the provision of critical services and the development of the requisite workforce and infrastructure; these services are primarily if not exclusively funded by Medicaid and Medicare in the U.S. Specific examples of these services are **long-term services and supports**, **home and community based services**, and **non-emergency medical transportation**. The unavailability of these services is particularly detrimental to the higher-cost, higher-need, generally older beneficiaries of these programs which – when their medical conditions and social risk factors are not properly addressed – end up utilizing healthcare resources at a disproportionate rate. It is important to note that, according to multiple studies, the five percent of individuals with the highest health spending generally account for approximately half of all healthcare spending[21].

[21] https://www.kff.org/health-policy-101-health-care-costs-and-affordability/

- Additionally, the deficiency in the healthcare premium for all programs (Medicaid, Medicare Advantage and Private/Commercial) due to lack of federal and state support has created a downward spiral effect of not been able to compete with the U.S. market with reimbursement rates to providers and compensation to nurses, allied health professionals and other professionals, which only exacerbates the emigration of these professionals to the U.S.

14. Despite these **funding constraints**, in our research and engagement with key stakeholders we identified that Puerto Rico is not benefiting from multiple federal funding opportunities; at a minimum these funding opportunities could help jump-start certain workforce development initiatives. For instance, last year HRSA launched a Health Workforce Initiative "to make sure our country has enough health workers, and that those health workers are receiving the support they deserve" and "address workforce shortages in underserved and rural communities, where access is often lacking"[22]. As noted in an HHS press release, gains in healthcare coverage must be supported by healthcare workforce investments to ensure availability of and accessibility to the healthcare professionals for which demand will increase in direct response to the coverage gains.

    Considering the state of Puerto Rico's healthcare workforce and the current federal administration's push to address "health equity", Puerto Rico should be very well positioned to access funds earmarked for workforce investments. Just two weeks ago, HHS announced over $100 million in awards for healthcare development programs to educational institutions and government agencies – entities based in Puerto Rico did not receive a single award. Moreover, this year the Center for Medicare & Medicaid Innovation announced three multi-year, multi-million dollar grant opportunities with workforce development goals; these opportunities were linked to equity in access to primary care, maternal health and improving behavioral-physical health coordination, all of which are areas of need in Puerto Rico. It is our understanding that the government of Puerto Rico did not apply for any of these opportunities. The reasons for this merit further investigation. It should be noted that private institutions have received some awards for other healthcare workforce development programs.

[22] https://www.hhs.gov/about/news/2024/09/17/biden-harris-administration-announces-nearly-100-million-grow-health-workforce.html

7. Recommendations

In order for the findings from this report to lead to actions that address those findings, the study's core advisory team discussed and agreed to include a series of recommendations in this report. Before delving into the recommendations, it is important to note that funding to cover the cost of healthcare services in Puerto Rico has been a well-documented challenge for decades. These funding inadequacies, including but not limited to federal Medicaid and Medicare cost coverage, have had serious repercussions on Puerto Rico's healthcare system and – to the extent that the local government attempted to offset these inadequacies with local funds and debt incurrence – Puerto Rico's economy. All that notwithstanding, given this study's limitations we are not able to make specific, quantified recommendations on matters related to Medicaid and Medicare funding on how to reallocate available local funds. As such, we believe that any recommendations regarding funding would be of little value. Moreover, we strongly believe there are numerous recommendations which do not have a direct bearing on funding that should have major impacts on healthcare workforce demand and supply.

Recommendation Framework

We have organized the recommendations in accordance with the framework shown in Exhibit 7A (below):

- **Recommendations designed to address workforce demand drivers.** These recommendations are based on the premise that the growing demand for certain services, particularly among those deemed "high-need, high-cost" individuals, is unsustainable and cannot be successfully "chased" – that is, adding workforce to tend to the more immediate needs of those individuals without effectively managing and ultimately improving the health of these individuals is not the most effective use of resources. Thus, we provide recommendations aimed at addressing shorter-term demand challenges as well as achieving "optimal" utilization of certain healthcare professionals and support resources in the longer term.
- **Recommendations designed to address workforce supply drivers.** These recommendations are designed to directly impact workforce supply, which as noted previously is a function of raw counts of healthcare professionals and support resources, their availability, operational capacity and accessibility.
- **Recommendations designed to healthcare workforce information, information management (IM) processes and systems.** During this study we encountered multiple challenges obtaining high-quality, complete, timely workforce information from various sources – the fragmentation of this information is an issue in and of itself. These challenges pointed to issues with the collection and management of this information. In order to effectively and efficiently assess the impact of initiatives implemented to resolve the imbalance between healthcare workforce demand and supply, it will be imperative to improve the collection of management of certain information.

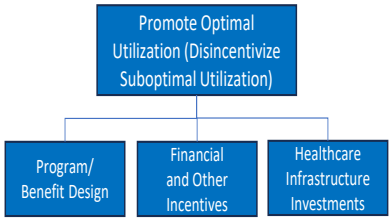
In the core advisory team's deliberations, recommendations were prioritized based on the following factors:

- **Degree of conclusiveness** – we wanted every recommendation to have a basis on a combination of the analysis we were able to conduct and a consensus of stakeholders. To this end, in addition to recommending specific initiatives we included recommendations for further study and/or stakeholder input to ensure they have the right level of analytical grounding and stakeholder buy-in.
- **Impact of laws and regulations** – we prioritized initiatives that would not require major changes to laws or regulations.
- **Dependencies** – some of our recommended initiatives lay the groundwork for other recommendations.
- **Potential impact on funding** – with the goal of maximizing the "return on investment (ROI)" of our recommendations, we prioritized recommendations that in our estimation would not require significant funding; that noted, some of our recommended initiatives would have benefited from federal grant funding which the local government decided not to pursue.

EXHIBIT 7A: RECOMMENDATION FRAMEWORK

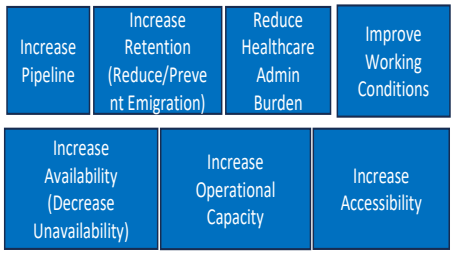
Workforce Demand Drivers

- Premise: the growing demand for certain services, particularly among those deemed "high-need, high-cost" individuals, is unsustainable and cannot be successfully "chased"; as such, recommendations to close demand-supply imbalances cannot be limited to increasing supply.
- Initiatives aimed at impacting healthcare service demand to improve demand-supply alignment need to result in more "optimal" utilization of certain healthcare professionals and support resources - irrespective of counts, availability, capacity and accessibility - based on generally accepted goals and benchmarks.



Workforce Supply Drivers

- Premise: recommended workforce supply initiatives need to 1) focus on "getting ahead" of demand/need and/or enabling a transition to more optimal utilization, (2) have maximum ROI – what is the least costly initiative that will yield the greatest impact, and (3) be both feasible in the short term and sustainable in the longer term.
- Initiatives should lead to:
  - Higher counts of certain types of healthcare professionals and support resources AND/OR
  - Increased availability of, capacity of and accessibility to certain types of healthcare professionals and support resources, ideally irrespective of program.



Workforce Information, Information Management (IM) Processes and Systems

- Ensure that more complete, accurate, accessible and both current and historical workforce information is collected in a way that facilitates continuous refresh of study artifacts, monitoring and evaluation of the impact of initiatives pursued to address workforce supply and demand, and comprehensive healthcare industry analysis.

Information

- What info needs to be collected, in what format, and how often?
- What is the value of collecting certain info, particularly info not being collected at present?
- Who should be supplying certain types of info?

IM Processes

- How should certain info be collected, and by which entity(ies)?
- Which organization(s) should be the "owners" and "custodians" of this info?
- What levers/ mechanisms should be employed to ensure timely provision of complete, accurate info ("carrots and sticks")?

IM Systems

- What systems should be in place to collect, manage and provide access to workforce info?
- What is the projected cost, time and effort that would be required to establish these systems (or modify existing systems)?
- Which organizations should be the "owners" and "operators" of these systems?
- What is the value of having these systems (vs. the alternative)?

Recommendation Property	Description
Degree of conclusiveness Note: **every** recommendation will have a basis in a combination of analysis completed to date and stakeholder input	- VERY HIGH Have enough info/analysis and stakeholder input - PENDING more info/analysis (detail the need) AND/OR - PENDING more stakeholder input (detail the input required)
Initiative requires funding (non-recurring and recurring) that is presently not available or accessible?	- No (although available/accessible funds may need to be redirected with an anticipated net benefit which will be discussed in the report) - Yes (if possible, specify potential fund sources)
Initiative requires changes to law(s)/regulation(s)?	- No - Change to regulations (flag) - Change to laws and, by implication, regulations (flag)
Initiative's recommended timing/sequencing	- Go first – critical enabler of "downstream" initiatives - Go first – "low-hanging fruit"/build momentum/buy goodwill - Defer – dependent on other initiatives and/or critical enablers

In addition to describing the recommendations and noting the study findings and demand-supply drivers impacted by each recommendation, we included information on the parties that we believe will be involved in the implementation of the recommendations.

A more comprehensive detailing of the recommendations, which includes the recommendation properties described above, is provided in Appendix E.

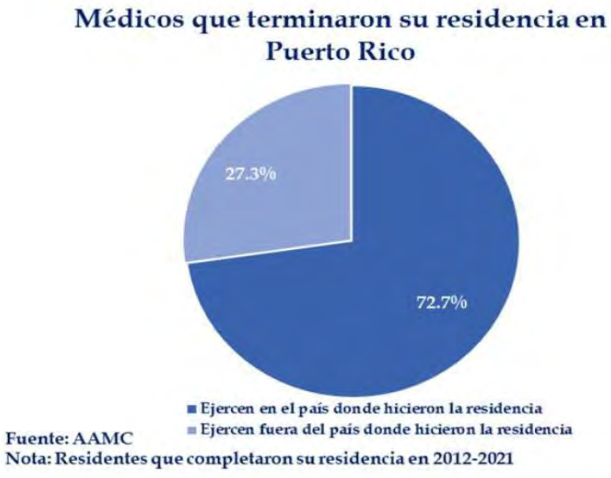
RECOMMENDATIONS THAT ADDRESS HEALTHCARE WORKFORCE SUPPLY DRIVERS

S1. Increase Pipeline and Retention

Situation: According to a survey by Association of American Medical Colleges (AAMC), medical doctors who complete their residencies/fellowships in Puerto Rico are 74 percent more likely to practice in Puerto Rico. In addition, due to language, cultural and regulatory barriers, recruiting doctors from the U.S. mainland is more challenging. Therefore, Puerto Rico needs to continue to develop more residency and fellowship programs to support filling gaps long term. However, it is important to understand what policies have already been implemented and what have been the challenges to achieve the goals of increasing program capacity, sustaining these programs, and retaining graduates.

The current situation in Puerto Rico's medical education system reflects a fragmented operating structure; tight, or in some cases insufficient, budgets which inhibit support for existing or innovative medical education programs at universities, colleges, or teaching hospitals. Additionally, it appears that medical education organizations (universities and teaching hospitals) are engaged in some degree of competition instead of collaborating to achieve common goals and objectives.

EXHIBIT 7B: PERCENTAGE OF PHYSICIANS WORKING IN PUERTO RICO WHO COMPLETED THEIR RESIDENCY IN PUERTO RICO



Recommendation S1.1: Establish Effective Territory-Wide Coordination and Governance of Healthcare Workforce Education and Development Programs

We recommend leveraging the law that established the *Centros Médicos Académicos Regionales (CMAR)*[23] to establish a coordination body for a **Territory-Wide Workforce Development Program**, a strategy for multi-level medical education that directly addresses and prioritizes healthcare practitioner needs identified in this study. The charter for this body should include the optimization of Puerto Rico's medical education system to strengthen local healthcare workforce quality and pipeline of healthcare practitioners. The focus of the program should be SCPs identified in our study as having the greatest gap between future demand and future supply, practitioners such as Nurse Practitioners and Physician Assistants that can augment the capacity of these SCPs as serve as "bridges" to other practitioners engaged in coordinated care models, and allied health professionals that will be critical to bolstering Puerto Rico's long-term services and supports infrastructure.

The coordination and governance function's goals should include:

[23] https://www.lexjuris.com/lexlex/leyes2006/lexl2006136.htm

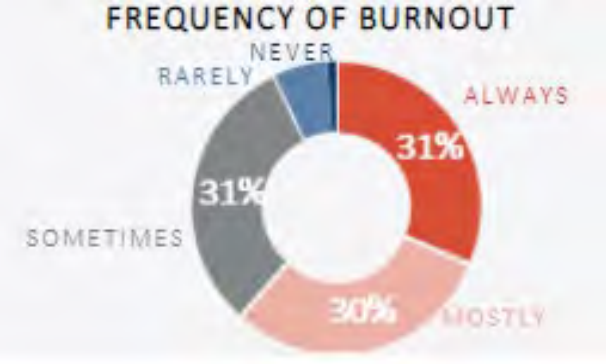
- Support a unified, territory-wide approach for medical education strategic planning and implementation of programs that have a positive impact on healthcare workforce development.
- Develop a process or structure that maximizes Puerto Rico's medical education environment by improving collaboration and coordination of decisions related to existing programs.
- Provide deep technical and programmatic expertise to medical education organizations to improve operating performance and funding, ideally to foster a more cohesive and inclusive medical education ecosystem. This could include both clinical and technological expertise development supports in multiple education and healthcare settings (e.g., schools, hospitals, clinics, physician offices, etc.).
- Monitor short and long term progress toward achieving unified goals and objectives.
- Establish a set of workforce impact measures that include access, staffing, workload and disease mitigation targeted outcomes and milestones enabling re-focus on certain initiatives as needed.
- Identify potential opportunities for improving the use and potential expansion of existing funding across medical education programs.
- Identify potential investment strategies for any newly allocated or additional funding that could have a positive impact on how medical education programs support future healthcare workforce outcomes.
- Ensure effective capture, triage and pursuit of funding opportunities - a critical component of any effective workforce development coordination and governance system must be the early identification, rapid and complete triage, timely decision-making, and disciplined pursuit of funding opportunities for investments in workforce development programs. As noted previously, Puerto Rico does not appear to be taking advantage of these funding opportunities. There may be multiple reasons for this, but Puerto Rico cannot afford to miss out on these opportunities.
- Implement a system that guarantees licenses, insurance credentials, and a reliable source of income immediately after graduation.

S2. Increase Retention (Reduce/Prevent Emigration)

Situation: To address these workforce challenges, incentives to healthcare providers should be carefully designed to increase patient access to care and participation in workforce training, particularly for underserved populations and areas. Incentives targeting key priority areas, such as rural healthcare, high need specialties, and night shift staffing, could help alleviate some of these workforce shortages and improve access to care across Puerto Rico.

Healthcare workers in Puerto Rico, including nurses and allied health professionals, also face heavy workloads, often leading to burnout. Driven by high stress level and difficult working conditions, burnout rates among nurses on the island are high - 92 percent feel they are always, most and sometimes feeling burnout (see survey results on Exhibit 7C). These rates surpass those in the mainland U.S, where feeling of burnout has gone down from 90 percent in 2021 to 81 percent in 2023.[24]

EXHIBIT 7C: FREQUENCY OF NURSES EXPERIENCING BURNOUT (FROM WORKFORCE SURVEY)



[24] https://nurse.org/articles/state-of-nursing-2023/

As a result, many professionals leave the Island or move into less demanding non-healthcare jobs within Puerto Rico, where they can earn similar pay. This further contributes to retention issues across the healthcare sector.

One physician in the interview process put it succinctly: “Maintaining a balance between wellness and job satisfaction is nearly impossible under these circumstances." It’s clear that workloads and working conditions need substantial improvement to reduce burnout and keep healthcare workers in their roles.

Importantly, salary is not the only reason healthcare professionals leave Puerto Rico. Many also relocate for better access to quality education for their children, lower living costs, and an overall higher quality of life elsewhere.

Recommendation S2.1: Enhance Incentive Programs for Healthcare Professionals

There are several initiatives, including revisions to existing programs, that stakeholders and our team maintain could have significant impact on the ability of Puerto Rico to retain highly trained and qualified healthcare workforce:

S2.1.1 Targeted Tax Incentives for Recruitment and Retention: In order to retain Puerto Rico-based healthcare professionals and attract professionals to relocate to Puerto Rico, tax incentives should be aligned with critical healthcare access metrics and demand-supply gaps. These incentives should prioritize key specialties and allied health professionals, particularly in underserved regions outside of metropolitan areas, and younger professionals with the goal of securing a long-term commitment to serving the population.

S2.1.2 Incentives for Returning Physicians: To attract physicians back to Puerto Rico, the tax incentives should be more substantial during their first five years of practice, supporting their efforts to establish new medical practices.

S2.1.3 Small Business Incentives for Medical Practices: Additional incentives, such as small business loans or financial support, should be provided to healthcare business owners. These incentives should be tied to employment growth and should not be age-restricted – historically in Puerto Rico physicians tend to become business owners later in their careers, typically after age 35.

Every recipient of these incentives should undergo annual audits to ensure they meet predetermined thresholds for patient access and care quality in both outpatient and inpatient settings, plus any other condition for receiving and retaining the incentive. A program similar to the audit program set up under the Electronic Health Record (EHR) Incentive Program, which required providers to submit certain attestation and federal certification documentation and required states to set up an audit function for verifying the validity of the documentation.

S3. Reduce Healthcare Administrative Burden

Situation: Healthcare professionals in Puerto Rico are spending more time in administrative activities as their counterparts in the U.S. This excessive administrative burden contributes to inefficiencies, waste, burnout, and reduced time for patients. Both key informants and survey respondents noted an inability to project revenues due to complexities in payment policies across payers, further exacerbating financial instability.

Recommendation S3.1: Modernize Healthcare Professional Licensing and Credentialing Processes and Systems

The *Oficina de Reglamentación y Certificación de los Profesionales de Salud (ORCPS)* within the Department of Health should prioritize modernizing the systems used for maintaining and managing provider licensure and information; numerous informants and survey respondents commented on the challenges they encountered submitting licensing paperwork to the PRDOH and even PRDOH staff expressed frustration with these processes and the old systems used to support these processes. We believe the ultimate goal of the modernization initiative should be to have updated licensing systems in which the vast majority of the licensing process can be handled electronically, including document submission and signatures. This has to be accompanied by reforming many of the current licensing regulations that

prevents the Board from been effective and supporting access and the increase of healthcare professionals in Puerto Rico. Some of these reforms need to include allowing for healthcare practitioners, especially SCPs, to provide telehealth services from outside of Puerto Rico, and eliminating the requirement that board member appointments have to be approved by the local legislature – historically the legislative approval requirement has reduced the number of resources interested in this role. An assessment of ORCPS regulations and procedures, as well as compliance requirements regarding licensure and education, should be an integral component of the system modernization initiative.

In addition to modernizing licensing systems and processes, provider credentialing systems and processes could also benefit from modernization. Ideally a designated a system should reduce costs for both providers and health insurance companies, minimize the duplication of effort required of healthcare providers contracted with multiple insurers, and improve adherence with federal government agency would set up a centralized credentialing system that would facilitate credentialing for all health insurance companies and government agencies contracting with select healthcare practitioners (e.g. ASSMCA). In recent years, several states have implemented centralized credentialing systems, including Florida, North Carolina and Texas. Ideally, the centralized platform would support multiple health coverage programs operating in Puerto Rico beginning with the GHP and Medicare Advantage. In 2023, the Department of Health issued an RFP for a Centralized Provider Screening and Credentialing system; it is our understanding that the awarding of this contract was delayed and had not received CMS or FOMB approval.

According to DOH officials, there has been some discussion about licensing system modernization but no formal effort to replace these systems is underway at present.

Recommendation S3.2: Promote Policy and Procedure Harmonization and Simplification

One of the major goals of the Health Insurance Portability & Accountability Act (HIPAA) was the simplification and streamlining of healthcare administrative processes; among its many benefits was the standardization of claims management instruments. The entire healthcare industry benefits from these standardization efforts, as they reduce the cost and burden associated with the administrative side of healthcare and can lead to more timely access to critical services and the avoidance of duplicative, wasteful procedures. Beyond HIPAA, there have been many state-level initiatives – mainly effected through Medicaid managed care contract requirements – to further standardize administrative processes and reduce burden on healthcare professionals; these initiatives have included eliminating prior authorization and referral requirements for certain procedures, standardizing the collection and provision of provider network data, and requiring health insurance companies to engage in "quality improvement" initiatives some of which may incorporate policy and procedure simplification. We would strongly encourage the Health Insurance Administration to explore these types of initiatives leading up to the next GHP procurement.

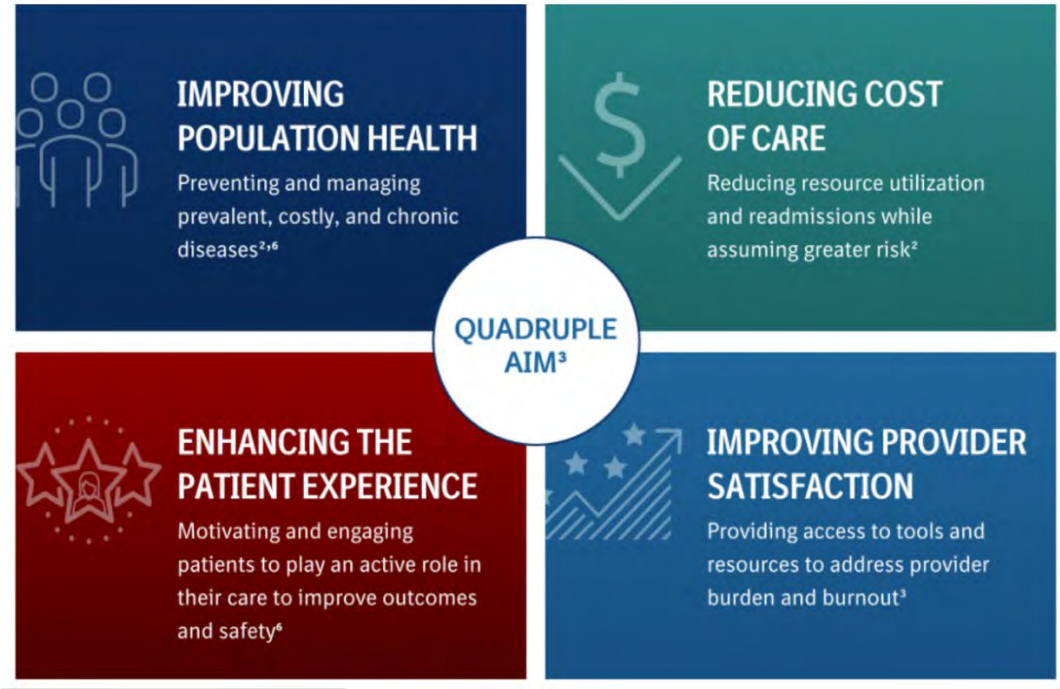
Recommendation S3.3: Support the Formation of More Resilient, Better Equipped Group Practices

The U.S. has been experiencing consolidation of services, including across primary and specialty care, for multiple reasons including to achieve operational economies of scale, improve the ability to recruit and retain staff, and ultimately to deliver more coordinated care which benefits the practitioners and the patients. While we recognize that the sole practitioner model has history and cultural drivers in Puerto Rico, and we do not believe that consolidation is a "one-size-fits-all" solution, we also believe that for numerous reasons – administrative burden, ability to manage data and information systems, operating costs, and workforce retention, among others – the sole practitioner model is increasingly *less* viable in Puerto Rico. Therefore, we recommend that Puerto Rico consider program design and provider reimbursement model changes that incentivize change in practice from sole practitioners to group practices with critical support staff such as nurse practitioners, physician assistants, therapists and dietitians. In conjunction with the exploration and encouragement of coordinated care models, we believe these changes would lead to more optimal use of healthcare professionals.

S4. Improve Working Conditions

Situation: Based on the findings of our study, addressing deteriorating working conditions will be critical to retaining healthcare workforce and improving the ability of the workforce to manage and deliver healthcare services effectively. The Quadruple Aim, the evolution of the Triple Aim, is a generally accepted framework developed by the U.S. Institute for Healthcare Improvement for driving meaningful improvement in the U.S. healthcare system[25]. In recognition of the importance of reducing avoidable burden and burnout within the healthcare workforce, a fourth aim focused on **improved provider satisfaction** was added to the framework as shown in Exhibit 7D.

EXHIBIT 7D. ARTICULATION OF THE HEALTHCARE QUADRUPLE AIM



Recommendation S4.1: Implement Initiatives Focused on Improving Working Conditions for Healthcare Professionals

Two specific initiatives that stakeholders interviewed and surveyed and our team believe would directly improve working conditions for healthcare professionals include:

> **S4.1.1 Life supports** – tax incentives similar to those already implemented or proposed in the U.S. for offsetting child care and elder care costs, or an augmentation of federally-funded programs designed to subsidize the cost of these services. Besides making it easier for these professionals to access and cover the cost of these services, the provision of these incentives should also stimulate the availability of these services and the development of the requisite workforce. The ultimate goal of this initiative is to ensure that the availability of healthcare professionals is not compromised by their inability to access or cover the cost of family care services. Moreover, these initiatives would have the effect of stimulating the growth of the family care services industry in Puerto Rico, which in turn could have a "multiplier effect" and help address the lack of much-needed long-term and home-and-community based services and supports.

[25] https://www.strategiesforqualitycare.com/quadruple-aim

S4.1.2 Infrastructure Improvement Fund: The creation of an investment fund or loan support program to encourage the rehabilitation of healthcare facilities - these could be targeted at "small businesses" such as new physician practices. This would address numerous concerns raised in the key informant interviews and surveys about the general state of healthcare facilities in Puerto Rico and the detrimental impact this has on working conditions and workforce satisfaction and retention, not to mention the direct impact that improvements in these facilities could have on healthcare outcomes including reduction in facility-acquired conditions. There is precedent within some municipalities for private sector entities to invest in facilities owned by municipalities; this investment fund and/or loan support program could be coupled with municipal initiatives particularly in regions of Puerto Rico where healthcare professional shortages are more acute.

S5. Increase Availability

Situation: In this report we have documented numerous factors driving down availability of certain healthcare practitioners; these factors range from the inability to tap into telehealth services, timely access to specialty care practitioners, and administrative burden.

Following are initiatives that we believe would be relatively low-cost and have a direct impact on workforce availability, particularly for healthcare practitioners in very short supply.

Recommendation S5.1: Liberalize Telehealth Regulations to Enable Greater Availability of Telehealth Services

Puerto Rico's telemedicine law (Law No. 68 of 2020, which amended the original Law No. 168 of 2018), allows licensed healthcare professionals to provide telemedicine services, as long as they are certified by the Puerto Rico Medical Licensing and Disciplinary Board or other relevant regulatory body. The certification, valid for three years, requires that professionals maintain an active medical license in Puerto Rico. Puerto Rico should look to become part of the **Interstate Medical Licensure Compact** (IMLC), an agreement among multiple U.S. states to streamline the licensing process for physicians who wish to practice in multiple states. Established in 2013, the IMLC offers an expedited path for doctors to obtain medical licenses in participating states to improve healthcare access especially through telemedicine, and address physician shortages in underserved areas. Key features of the IMLC include:

- Physicians must meet specific criteria to apply through the IMLC. These include holding a full and unrestricted medical license in a member state (referred to as the "State of Principal License"), having passed the USMLE or COMLEX within a certain timeframe, and having no history of disciplinary actions.
- More than thirty states, Washington, D.C. and Guam participate in the compact, allowing licensed physicians to practice across these regions without having to navigate licensing processes in each state.
- Telemedicine expansion: The IMLC has made it easier for physicians to deliver telemedicine services across state lines, which is critical for improving access to specialists in underserved communities.
- Physicians applying through the compact undergo primary source verification and, once approved, can apply for licenses in other member states quickly. The IMLC does not grant a national license; rather, it simplifies the process of obtaining multiple state licenses.
- The compact is overseen by the Interstate Medical Licensure Compact Commission, which ensures that member states follow the agreed-upon procedures and regulations.

The IMLC has become an essential tool for expanding healthcare access via telemedicine and addressing the varying healthcare needs across states.

Recommendation S5.2: Test and Evaluate Specialist Care Practitioner Consult Programs

Electronic consultations ("e-consults") are asynchronous, consultative, provider-to-provider communications generally conducted securely within a shared electronic health record or web-based platform. E-consults are intended to improve access to specialty expertise for patients and providers without the need for a face-to-face visit. In the U.S., because of the documented shortage in specialty care practitioners there has been a rapid evolution of e-consult models and solution providers, which usually combine platform provision with a network of licensed, credentialed practitioners. Understanding that use of e-consult services would require the changes in telehealth laws and regulations alluded to previously, the experience of these models of U.S. is promising:

- A recently published review of seventy-two studies performed in North America showed that e-consultation was associated with improved access to hospital care and an increase in avoided referrals to specialists[26].
- Findings from a U.S. pilot study published in 2023 demonstrated the potential for e-consults to expand access to specialty care and reduce costs by an average of $195 per person within a commercial beneficiary population[27].

As a modality of telehealth that specifically targets a documented healthcare professional supply deficiency, which can include specialty care practitioners and subspecialists within a particular specialty (which may be in short supply in the U.S. as well) we believe this is a model worth exploring under a structured demonstration project.

S6. Increase Operational Capacity

Situation: There are models designed to improve care coordination across healthcare professionals, and make more appropriate use of professionals with certain experience and credentials in the best care setting at the right time in the course of a patient's care; those models would increase operational capacity in addition to impacting workforce demand. Because of their expected impact on workforce demand, we discuss recommendations for those models later in this section.

Recommendation S6.1: Engage in Targeted Investments in Healthcare Facilities and Related Infrastructure

S6.1.1 Informants indicated that **investing in healthcare facility improvements –** with a particular focus on hospitals (including teaching hospitals) – is critical for the long-term growth and sustainability of Puerto Rico's healthcare system. This includes upgrading existing facilities with modern medical equipment, medical and surgical technology, and improvements in cable plant infrastructure that enable high-speed communications within facilities and within a campus. These investments were cited as essential not only for delivering high-quality care but also for effectively educating and retaining healthcare professionals in Puerto Rico.

S6.1.2 One of the major challenges highlighted by stakeholders is the escalating cost and stability of essential utilities, particularly electricity, which reportedly has been a factor in the closure of several hospitals. As one interviewee noted, "Every day, the cost of energy keeps increasing, and the services offered depend on this utility. It is well known that this has been a determining factor in the cases of hospitals that have recently been forced to shut down operations." This statement underscores the urgent need for governmental intervention to address rising energy costs in healthcare facilities, ensuring that hospitals, clinics and physician practices can operate without the growing financial burden of utility bills. To address the challenges related to infrastructure and utilities, stakeholders recommended **policy support for energy costs**. This could involve subsidies, tax breaks, or financial incentives for going "off the grid" that enable hospitals, clinics and physician practices to manage utility expenses and ensure energy stability without compromising care quality.

[26] https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2813916#:~:text=Outcomes%20on%20access%20to%20hospital,outcomes%20greatly%20differed%20across%20studies.

[27] https://www.healthsystemtracker.org/brief/can-econsults-reduce-commercial-health-spending-learnings-from-an-arkansas-pilot-study/

S6.1.3 Beyond facilities and utilities, **investments in broadband** were cited as vital for adopting new healthcare technologies, including telemedicine, electronic health records and artificial intelligence-powered applications. These technologies depend on stable, high-bandwidth telecommunications connections to function effectively. Ensuring that healthcare facilities have access to these utilities is essential for the continued modernization of Puerto Rico's healthcare system.

Recommendation S6.2: Accelerate Establishment of Territory-Wide Health Information Exchange

Health information exchange (HIE) is a capability which is often cited in the healthcare world as a critical component of "infrastructure" that has a direct bearing on practitioner productivity. The primary mission of health information exchanges is to a facilitate the real-time, secure sharing of health information among authorized healthcare professionals and between professionals and facilities such as hospitals and laboratories. Ultimately, this exchange of information is intended to improve the quality, efficiency, and coordination of healthcare within a region or a state. Boosted by federal funding that began with the American Recovery and Reinvestment Act of 2009 (ARRA), many states successfully implemented HIEs or, depending on the idiosyncrasies of a particular state, multiple regional HIEs – for instance, eight distinct regional health information organizations (RHIOs) operate mostly successfully in the state of New York. A study published by the National Institutes of Health[28] highlighted multiple positive impacts of HIEs including but not limited to fewer duplicated procedures, improved patient safety through avoidance of certain procedures or prescriptions, and more timely access to more complete patient information for diagnostic and treatment decision making, all of which impact costs and practitioner productivity.

Since 2010, Puerto Rico has had access to millions of dollars in federal funding for HIE planning, implementation and operations; despite that, multiple efforts have not resulted in a functioning territory-wide HIE. We strongly recommend that the current effort by the Department of Health to procure an HIE technical and operations solution be prioritized and expedited as much as possible.

Once implemented, HIE should be treated as a utility that is either funded in full by the government or funded through subscription or transaction fees. There are very mature financial sustainability models for HIEs operating in the U.S., some of which include contributions from health insurance companies under the premise that improvements in care coordination, reductions in redundant or duplicative procedures, and avoidance of errors resulting from improved health information exchange have a direct financial benefit for the companies.

S.7 Increase Accessibility

Situation: In addition to the telehealth regulation changes described previously, which would impact both availability of certain high-demand professionals and their accessibility, there is a need to bring healthcare services and practitioners closer to patients and to reduce the burden some patients face to reach practitioners.

Recommendation S7.1: Promote Expanded Coverage of Non-Emergency Transportation Services across All Health Coverage Programs

Medicare Advantage Organizations (MAOs) are already offering limited non-emergency transportation benefits to its members, but in recent years MAOs have cut back on these benefits because of payment reductions to MAOs operating in Puerto Rico. Additionally, the GHP is beginning to offer this benefit on a limited basis. Given the importance of access to transportation to ensure timely access to needed services, and the potential for this access to directly result in reducing avoidable disease and associated treatment costs, we strongly recommend expanding the availability of these services yet targeting them to older populations that would depend on them the most.

Under the reasonable assumption that lack of transportation among older adults correlates highly with living alone, it is imperative that transportation availability for this population be increased since the alternative is lack of timely

[28] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7646861/

access to needed services. The situation of older adults in Puerto Rico living alone is progressively deteriorating: according to 2019 U.S. Census Bureau estimates, 26 percent of older adults in Puerto Rico lived alone, up from 21 percent based on the 2010 decennial census[29]; a recent study conducted in 2023 by the University of Alabama in Birmingham suggests that this percentage has risen to 32 percent[30].

Recommendation S7.2: Promote Expanded Coverage of At-Home Services, Including Services Designed to Address Social Risk Factors, across All Health Coverage Programs. This includes but is not limited to lab draws, post-operative and habilitative/rehabilitative therapy, prescription drug delivery, and coverage of services such as meal/grocery delivery that ensure that critical social risk factors are addressed proactively. MAOs have been building these services into their benefit packages as "value-added benefits" in recognition of how they can impact utilization of avoidable, costly healthcare services. That noted, changes in federal regulation are causing MAOs to cut back on these benefits.

Recommendations that Address Healthcare Workforce Demand Drivers: Optimize Workforce Utilization

Solving the demand-supply misalignment requires addressing workforce supply in concert with tackling healthcare service demand to drive more optimal utilization of certain healthcare professionals and support resources – irrespective of counts, availability, capacity and accessibility – based on generally accepted goals and benchmarks.

D1. Ensure Program/Benefit Design Aligns with the Goal of Closing Demand-Supply Gaps

Situation: Previously we elaborated on several recommendations tied directly to changes in the design of certain healthcare programs, including non-emergency transportation, at-home services and telehealth access. Beyond those proposed changes, there are several potentially transformational changes to program/benefit design that, while somewhat dependent on increases in program funding, have the potential to both redirect utilization to more appropriate care settings and reduce costly, avoidable utilization that could also be palliative or even futile.

Recommendation D1.1: Stimulate the Development of Long-Term and Home-and-Community-Based Services and Supports (LTSS/HCBS) - Increase Government Health Plan Coverage and Provide Investment Supports
Given that historically these services have not been accessible through any health coverage program in Puerto Rico, we believe it is important to provide substantial context on these services in this report.

LTSS/HCBS incorporates a broad set of services that include:

- Institutional care provided in skilled nursing facilities (SNFs) and intermediate care facilities for people with intellectual disabilities (ICF/IID). In the United States, nursing facility care is a mandatory Medicaid benefit and is a limited benefit within the Medicare program; intermediate care facility care is an optional Medicaid benefit but most Medicaid programs provide coverage.

- A wider range of alternatives or complements to institutional care focused on services provided in a patient's home or in their communities, such as adult daycare, home health, personal care, and – depending on how HCBS programs are structured - social services such as meal preparation and delivery, home modifications designed to prevent injuries and improve mobility and quality of life for residents, supported employment. HCBS was originally available as a Medicaid waiver option, but many states now offer these as Medicaid state plan benefits.

Limited, fragmented, insufficient LTSS/HCBS is a worldwide phenomenon. Elders and disabled individuals face many challenges and risks, including financial, social and health related risks, that can be addressed with the right mix and

[29] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9683498/#:~:text=According%20to%202010%20U.S.%20Census,U.S.%20Census%20Bureau%2C%202021).

[30] https://digitalcommons.library.uab.edu/cgi/viewcontent.cgi?article=1056&context=etd-collection

availability of LTSS/HCBS. These risks make elders one of the most vulnerable population cohorts. Poverty is a key driver of many eldercare challenges, in addition to isolation and lack of social supports. According to the Kaiser Family Foundation (KFF) "In 2022, nearly three in ten adults in the U.S. age 65 and older had incomes below 200 percent of the federal poverty level. In Puerto Rico the poverty problem among the elder population is more severe: over 40 percent of elders have incomes below the federal poverty level.[31] Adding to the findings in the KFF study are numerous reports of medically indigent and abandoned elders.

In the absence of a robust LTSS/HCBS infrastructure and the resulting overreliance on family members for providing even basic LTSS/HCBS, the emigration of working-age adults exacerbates these challenges. Moreover, as noted previously the lack of LTSS/HCBS has a direct bearing on the availability of Puerto Rico's healthcare workforce – a "double whammy" impact that calls for urgent action. Finally, the aforementioned emigration of professionals who are likely to have aging family members in Puerto Rico strongly suggests there would be demand for LTSS/HCBS beyond what government-funded programs would cover.

A critical consideration in building up Puerto Rico's LTSS/HCBS infrastructure is the desire to remain at home. Supporting this proposition, results of a 2021 AARP survey showed that 84 percent of Puerto Ricans age 45 and above would rather stay at home with caregiver assistance than live in a nursing home or assisted-living facility. To enable that choice, the survey found widespread support among Puerto Ricans for more services such as home health care, housekeeping, transportation, meal delivery, and respite care.[32] Another critical consideration is the recognition that LTSS/HCBS needs are not limited to the elderly population – relative to the U.S. mainland, Puerto Rico has a disproportionate number of disabled children and adults who pose unique challenges to the health care system in addition to education and other challenges which have received considerable press in recent years. Moreover, in driving towards a robust LTSS/HCBS delivery system consideration must be given to the role municipal and community-based organizations can play within this system – for instance, in the U.S. mainland area agencies of aging (AAAs) play a critical role in LTSS/HCBS delivery; AAAs are usually county or city-run and provide a wide range of services from transportation to adult day care and recreational services in community centers. Finally, a robust LTSS/HCBS delivery system must provide services across a **continuum** – including continuing care retirement communities (CCRCs) where more affluent and independent elders can reside and receive services as needed, assisted living facilities for elders with more independent living impairments, and more traditional institutional settings such as skilled nursing facilities. Ideally this continuum should reflect individual needs based on severity of illness (e.g. advanced cognitive disorders), degree of mobility, and ability to pay.

We are aware of an LTSS/HCBS study being conducted under the direction of the Department of Health; this study is tied to a federal Money Follows the Person (MFP) planning grant from the U.S. Department of Health and Human Services. It is important that this study be focused on quantifying the need for these services and supports and the implications of that need on federal funding. We must also note that even though Puerto Rico received the MFP planning grant, there is no funding mechanism for augmenting Puerto Rico's federal Medicaid allotment in response to the study's findings or any associated recommendations. Puerto Rico's federal Medicaid allotment is a particularly critical consideration when it comes to bolstering the territory's LTSS/HCBS infrastructure because of the role Medicaid typically plays in funding these services – in the U.S., **Medicaid covers more than 44 percent of LTSS costs**[33]. Because of the role that Medicaid funding plays in enabling LTSS/HCBS in the U.S., we recommend that the GHP take the lead in providing coverage for these services in Puerto Rico with the expectation that self-pay demand would follow once the LTSS/HCBS infrastructure reached a certain level of sustainable capacity. Specifically,

- We believe there is considerable value in exploring how LTSS/HCBS investments can be stimulated by aligning private investment – potentially coupled with local government incentives and supports - with the pent-up demand which surely exists from so many Puerto Rico working-age professionals living in the U.S. mainland

[31] https://www.kff.org/medicare/issue-brief/how-many-older-adults-live-in-poverty/

[32] https://www.aarp.org/research/topics/care/info-2021/2021-puerto-rico-family-caregiving-survey.html

[33] https://crsreports.congress.gov/product/pdf/IF/IF10343#:~:text=Medicaid%20is%20the%20largest%20single,44.3%25%20of%20all%20LTSS%20expenditures

with aging and disabled family members in Puerto Rico.

- We also believe that a limited, targeted LTSS/HCBS benefit be considered for the Government Health Plan (GHP) with the goal of offsetting the costs of this benefit with avoidance of high-cost reactive care services such as hospital emergency services, preventable hospitalizations and medical procedures, and certain medications. In the aforementioned AARP study, two-thirds of respondents have experience with unpaid family caregiving, while the rest anticipate they will likely become a caregiver for an adult loved one sometime in the future. Input gathered through key informant interviews and the survey suggests incorporating some level of compensation and providing access to respite services for family caregivers; personal care attendant programs in the U.S. are structured similarly[34].

- Additionally, in keeping with the results from the AARP study, the following services would be most helpful to caregivers: transportation to medical appointments (70 percent of respondents), help with household chores (69 percent of respondents), and assistance with meals including transportation to food markets and establishments where beneficiaries can purchase foodstuffs (65 percent of respondents).

Recommendation D1.2: Evaluate the Feasibility and Potential Impact of Implementing All-Payer Reimbursement Models for Certain Services

The federal government has encouraged the development and implementation of **"all-payer models"** that streamline payment and administrative systems across payers to reduce waste and encourage more coordinated, integrated and value-based care. There may be an opportunity to engage local payers to develop all-payer reimbursement models for certain services that address the specific needs expressed by Puerto Rico stakeholders. The models should be designed considering the input of patients, providers and payers. This should also impact availability, when evaluated across health coverage programs, and availability **equity** – a major federal concern.

Maryland's all-payer hospital reimbursement model is often cited as a successful example of this type of initiative. This model was made possible in part by a federal waiver of Medicare hospital reimbursement provisions for both inpatient and outpatient services. Through this waiver, Maryland established a commission that, based on an impartial evaluation of hospital costs and population needs, sets rates for all hospital-based services. Every payer in the state is then required to pay the same rates for those services. To receive federal approval of this waiver, the state had to contain annual hospital payment increases, achieve savings against projected Medicare cost increases, and show a statistically significant impact on readmissions, emergency department visits, and hospital-acquired conditions. Implementation of this model in conjunction with other hospital-focused initiatives led to meaningful impacts across a broad range of metrics[35]. Given the state of Puerto Rico's hospitals, such a model may be worth exploring; moreover, implementing this model with certain practitioners may help alleviate accessibility challenges that clients of certain health coverage programs are experiencing.

D2. Ensure Care Management and Delivery Models Align with the Goal of Closing Demand-Supply Gaps

Situation: Our study confirmed a growing crisis with chronic diseases such as diabetes, hypertension and chronic obstructive pulmonary disease. The healthcare system struggles to manage these and other conditions due to significant barriers to access, resulting in worsened health outcomes for patients and increased demand for healthcare services. Informants emphasized that many patients, particularly those with chronic conditions, experience delays in receiving care, and the lack of early intervention causes their health to deteriorate requiring more care. Moreover, many patients experienced multiple chronic diseases, sometimes in conjunction with behavioral health conditions and social risk factors – these are the patients often referred to as "high-need, high-cost" that consume a disproportionate share of healthcare resources.

[34] https://web.partnership.vcu.edu/cdservices/resources/STG/STG_12710/FINAL%20What%20is%20a%20PCA%20GRAPHICS%20REV121609HP.pdf

[35] https://www.cms.gov/priorities/innovation/data-and-reports/2022/wp-eval-synthesis-21models-aag

Recommendation D2.1: Test and Evaluate the Potential Impact of Coordinated Care Models Focused on High-Cost, High-Need Populations

Key informants, survey respondents and our core advisory team agreed that the challenge of delivering impactful healthcare and critical social services to high-need, high-cost individuals warrants evaluation of innovative approaches for managing the care of these individuals. Without intending to endorse or advocate for a particular model, we wanted to highlight five models that have been demonstrated to have a positive impact on high-need, high-cost populations in the U.S.; as such we believe they warrant exploration in Puerto Rico:

D2.1.1 PACE (Program for All-Inclusive Care for the Elderly) – as defined in federal regulation, the PACE model is designed to provide medical and social services to elderly individuals who are still living in the community yet would qualify for LTSS benefits based on needs and conditions. Most PACE participants are eligible for both Medicare and Medicaid benefits. The PACE financing model combines capitated payments from Medicare and either Medicaid or private pay sources - PACE organizations receive risk-adjusted, per member per month payments to take on full financial risk for the total cost of participants' care. This financing structure allows the programs significant flexibility in care delivery while aiming to incentivize high-value care and innovation. PACE programs have an interdisciplinary care team that manages and provides participants' care.

A 2021 report from the federal Office of the Assistant Secretary for Planning and Evaluation (ASPE) found that full-benefit dually eligible beneficiaries enrolled in PACE are significantly less likely to be hospitalized, require emergency department care, and require nursing facility care than Medicare Advantage enrollees. The rate at which PACE participants experience potentially preventable hospitalizations is also substantially lower than similar populations: 44% lower than the rate for dually eligible Medicaid nursing home residents, and 60% lower than the rate for dually eligible HCBS waiver enrollees. Several studies across more than 20 years of medical data demonstrate a strong association between PACE enrollment and reduced hospitalization. Moreover, data suggest that PACE could produce cost savings - in South Carolina, Oklahoma and Wyoming, PACE led to cost savings serving beneficiaries compared with providing care under a Medicaid waiver or in a nursing home. South Carolina saved almost $9,000 per PACE participant per year, while Wyoming saved an estimated $12,361 per participant annually.[36]

D2.1.2 Blue Zones – this initiative is a community well-being improvement initiative designed to change how residents in a community interact with the world around them, on the premise that healthier environments drive people to healthier lifestyle choices. Communities throughout the world where the average life span is considerably greater than the global average were targeted for research that led to the development of a best practices "playbook" that can be employed in other communities. Under this model, employers, schools, food establishments and grocery stores, faith-based and civic organizations are brought together to agree on and implement initiatives – such as selling healthier food products and incentivizing their purchase – designed to improve the community's health status and reduce avoidable health events.

Several studies[37] have been conducted that suggest these projects can have meaningful, lasting impacts on a community's wellbeing; these studies include:

- In Fort Worth, Texas – over a five-year period, residents experienced a 31 percent increase in physical activity, a 9 percent rise in healthy eating, a 7 percent decline in smoking rates, an 11 percent drop in high cholesterol and 7 percent drop in high blood pressure.

- In Albert Lea, Minnesota - post-implementation over a six-year period, there was a 40 percent reduction in healthcare claims among city workers and an estimated 2.9-year increase in life expectancy; additionally among city residents there was a 35 percent drop in smoking, a 12 percent reduction in high cholesterol, and a 4 percent reduction in high blood pressure.

[36] https://bipartisanpolicy.org/report/improving-pace/

[37] https://www.bluezones.com/blue-zones-project-results-albert-lea-mn/; https://www.bluezones.com/blue-zones-project-results-fort-worth-tx-2/

D2.1.3 Ornish Lifestyle Medicine Program – this program, which can be covered by Traditional Medicare and has undergone multiple refinements since its inception, incorporates various forms of body training, diet modification, training and coaching, and a virtual support system to drive significant, sustained lifestyle changes. Documented impacts of this program[38] include:

- Coronary Artery Disease Regression: participants adhering to the Ornish program experienced a 4.5 percent average reduction in coronary artery stenosis after one year, while the control group saw a 5.4 percent progression.

- Five-Year Outcomes: After five years, the experimental group maintained a 7.9 percent improvement, whereas the control group experienced a 27.7 percent worsening in coronary artery blockage.

- Cardiac Events: At five years, there were more cardiac events in the control group (2.25 events per patient) than the experimental group (0.89 events per patient).

D2.1.4 Centers for Disease Control and Prevention (CDC) Diabetes Prevention Program (DPP) – this program is a partnership of public and private organizations designed to make it easier for participants at risk for type 2 diabetes to enter an evidence-based lifestyle change program to reduce their disease risk. The original DPP study of the effectiveness of DPP[39] demonstrated that participants undergoing lifestyle interventions experienced a 58 percent reduction in the incidence of type 2 diabetes over an average follow-up of 2.8 years compared to the placebo group. Moreover, the incidence of diabetes was 39 percent lower in the lifestyle-intervention group than in a group only taking a drug (Metformin) designed to help manage diabetes.

D2.1.5 Wellness Opportunity Zones

The concept of "Wellness Opportunity Zones" as implemented in city of Nashville is part of a broader initiative aimed at improving health outcomes in underserved communities, starting with a focus on hypertension. The city, in partnership with NashvilleHealth and the Nashville Wellness Collaborative, launched the "Heart of Nashville" project in 2023. This initiative was backed by a $1 million grant from the Metro Nashville Mayor's office and was dedicated to creating the first Wellness Opportunity Zone in North Nashville, where hypertension rates are notably high. The project went beyond clinical treatment by addressing social determinants of health, such as food security, transportation, and employment barriers. These systemic issues exacerbate health inequities, and the collaborative seeks to mitigate them through coordinated efforts with local organizations like the Matthew Walker Comprehensive Health Center and The Nashville Food Project. By tackling these barriers, the initiative aimed to reduce chronic illnesses and improve overall community wellness in Nashville[40].

We believe this zone serves as a model to be expanded across the city, potentially replicating its framework to address various health disparities, particularly in areas facing structural inequities. Wellness Opportunity Zones also incorporate financial incentives mirror to the model of EDA's Opportunity Zones to ensure economic growth in the area also tackle key issues like food deserts and high unemployment rates.

Tests of all of these models could be built into the GHP and Ley 95 contracts as demonstration projects or quality improvement initiatives with incentives for MCOs that meet certain targets. These models could also be "carved out" and treated as demonstration projects for which certain entities – e.g. a consortium of primary care groups and social services organizations with specific capabilities – could be engaged, akin to the models tested in the U.S. under the auspice of the Center for Medicare and Medicaid Innovation (CMMI). The CMMI often provides grant funding to jump-start the implementation these models and test their effectiveness. Additionally, utilization controls and patient incentives and disincentives could be built into these models with the goals of evaluating their effectiveness without requiring disruptive changes in program design.

[38] - https://jamanetwork.com/journals/jama/fullarticle/188274
[39] https://www.nejm.org/doi/full/10.1056/NEJMoa012512
[40] (https://www.nashvillehealth.org/heartofnashville/).

D.3 Expanding Health Coverage Options

Situation: In the last three decades, healthcare reform initiatives in Puerto Rico have focused mainly on the GHP and Medicare; during that period, private health insurance enrollees continue to struggle with benefit reductions, rising cost of premiums, employers not offering healthcare benefits, and more limited access to services. We believe this phenomenon is partly driven by "crowd-out" – expansion of government-funded programs that leads to reductions in private health insurance offer and take-up, which can trigger a "death spiral" in private health insurance markets. Moreover, the redetermination of GHP enrollees following the end of the COVID-19 public health emergency, even after accounting for expansion of GHP eligibility, has the potential to increase the number of uninsured individuals in Puerto Rico. Any increase in the number of uninsured individuals could have major adverse consequences to healthcare providers, particularly hospitals since they are mandated by federal law to provide care to uninsured individuals, already experiencing significant financial distress.

Recommendation D3.1: Evaluate the Viability and Potential Impact of Establishing a Health Insurance Exchange
As an alternative to a "one-size-fits-all" approach to providing healthcare coverage to Puerto Rico residents, and with the goals of providing more cost-effective, tailored coverage options for individuals with different priorities and conditions, preventing "crowd-out", and redirecting federal Medicaid funds to purposes such as bolstering Puerto Rico's LTSS/HCBS infrastructure, we recommend an evaluation of the feasibility of establishing a **health insurance exchange** in Puerto Rico. In the last five years, states with governments that initially did not want to operate an insurance exchange – including Georgia, Idaho, Illinois, Kentucky, Maine, New Jersey, Pennsylvania and Virginia – have established or will be establishing exchanges (refer to Exhibit 7E for more context). Additionally, prior to passage of the Affordable Care Act (ACA) states like Tennessee implemented programs that provided subsidies to individuals, small businesses and associations with the goal of maximizing healthcare coverage in their states at lower costs to the government than Medicaid or CHIP[41]. A Puerto Rico health insurance exchange could incorporate elements of state-based insurance exchanges and the aforementioned subsidy programs to provide easier access to individuals who are currently uninsured, enrolled in the GHP at considerable cost to the federal and Puerto Rico governments even though the GHP's benefit package may not be well aligned to the needs of those individuals, or dependent on very expensive individual and small group insurance products which renders these individuals "under-insured".

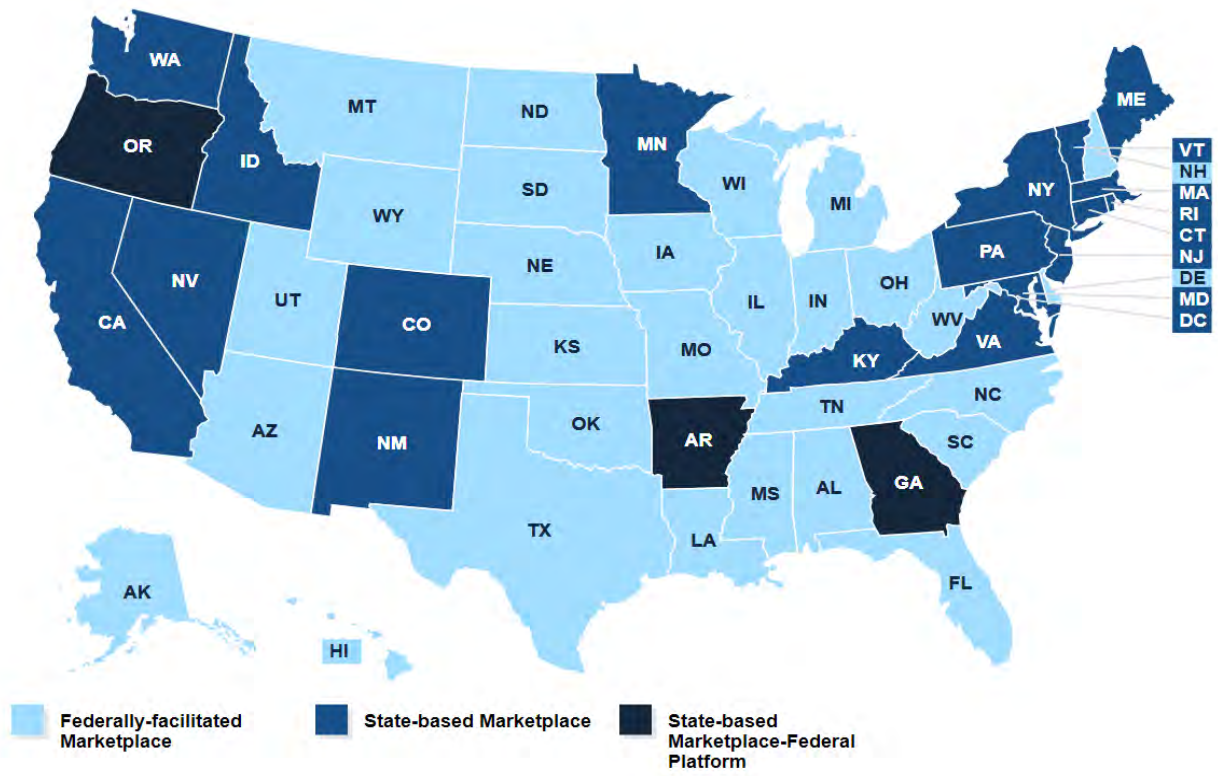
The Department of Health commissioned a study in 2011 to explore the feasibility of a Puerto Rico health insurance exchange, and several administrations since have explored the concept. At one point Puerto Rico would have had access to virtually unlimited federal grant funding – with no match obligation – to stand up the technology and operations infrastructure to operate an exchange. Moreover, in discussions held at the time there was the option of migrating the Ley 95 population to the exchange and leveraging the same technology and operations infrastructure to facilitate plan selection and premium management.

A critical policy consideration associated with health insurance exchanges is the goal to drive more individuals to employer-sponsored health coverage, even if it is government-subsidized, as opposed to exacerbating reliance on government-funded coverage as a means of stimulating economic activity. Additionally, extending healthcare coverage to currently uninsured individuals provides more predictable reimbursement to healthcare practitioners, hospitals and other providers, thus helping stabilize and grow the healthcare workforce.

[41] https://www.commonwealthfund.org/publications/newsletter-article/cover-tennessee-offers-affordable-insurance-small-businesses

EXHIBIT 7E. HEALTH INSURANCE EXCHANGES (AKA "MARKETPLACES") IN THE U.S.

Source: Kaiser Family Foundation.



RECOMMENDATIONS THAT ADDRESS HEALTHCARE WORKFORCE INFORMATION AND RELATED INFORMATION MANAGEMENT PROCESSES AND SYSTEMS

These recommendations are designed to fortify the information infrastructure required to maintain, optimize the utilization, and preserve the value of the work products created and delivered to the FOMB as part of the study – specifically, the workforce profile and the workforce model. Moreover, a more robust healthcare workforce information infrastructure is essential to assessing the impact of any of the recommendations outlined in this report as they are implemented, or any other healthcare workforce initiative that is implemented subsequent to the publication of this report. This is a critical capability that Puerto Rico needs and sorely lacks based on our experience requesting and compiling complete, usable data from multiple sources for this study.

Recommendation I.1: Establish an all-payer claims database

All-payer claims databases (APCDs) are multi-dimensional, regional or state-level databases that ideally incorporate medical claims/encounters, pharmacy claims/encounters, dental claims/encounters, and eligibility/enrollment and provider data collected from all of the private and public payers operating in the region or state. Generally APCD data are reported directly by payers, often as part of a mandate.

In terms of the ability to support cost, utilization and quality/outcomes analyses, APCDs have three potential advantages over other information management solutions:

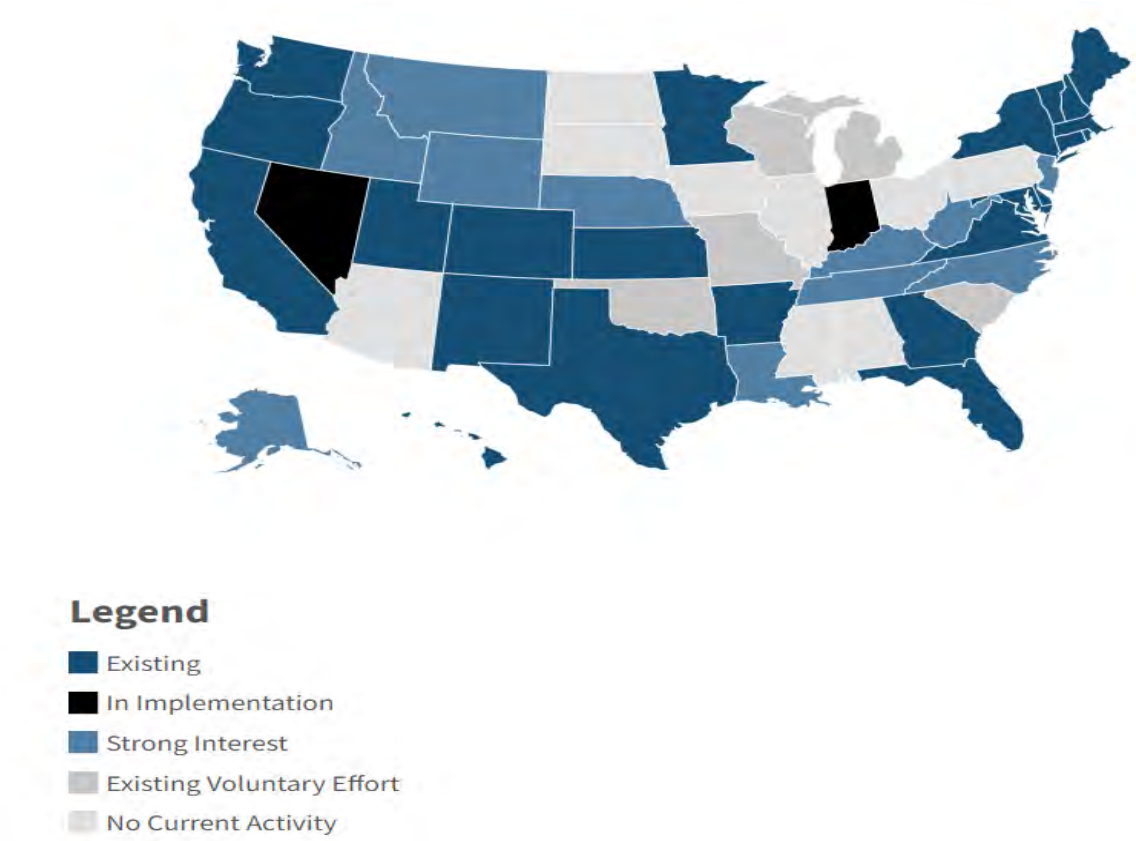
- They include information on private insurance that many other datasets do not include.
- They include data from most or all insurance companies operating in any particular state, in contrast to most proprietary datasets.
- They include information on care for patients across care sites, rather than just hospitalizations and

emergency department visits reported as part of discharge data systems maintained by most States through State governments or hospital associations. They also include large sample sizes, geographic representation, and capture of longitudinal information on a wide range of individual patients.

According to the most recent report from the APCD Council, a national organization established to support states with APCD strategy, development and implementation, more than twenty states have fully functioning, APCDs receiving data from all payers operating in the state, and forty states with some level of APCD in place. Additionally, eighteen states varying in size and population from California to Rhode Island have legislation that mandated the creation of APCDs. Furthermore, several states including Maine, Massachusetts, New York and Virginia have leveraged their APCDs to launch public Web sites that provide access to and transparency on healthcare utilization and expenditures in their states.[42] [43] Exhibit 7F provides more information on APCD activity across the U.S.

Given that Puerto Rico has a "closed" healthcare operating environment and the requisite regulatory frameworks within the Office of the Insurance Commissioner and the Department of Health, we believe that establishing an APCD should be achievable in Puerto Rico in the shorter term. Moreover, there are information technology assets owned by the government which theoretically could be leveraged for this project, although based on the U.S. experience we believe that consideration should be given to a university taking on this project.

EXHIBIT 7F. ALL-PAYER CLAIMS DATABASE ACTIVITY IN THE U.S.



[42] https://www.apcdcouncil.org/, https://www.ahrq.gov/data/apcd/index.html

[43] https://www.health.ny.gov/technology/all_payer_database/

Recommendation I.2: Establish a healthcare professional information hub

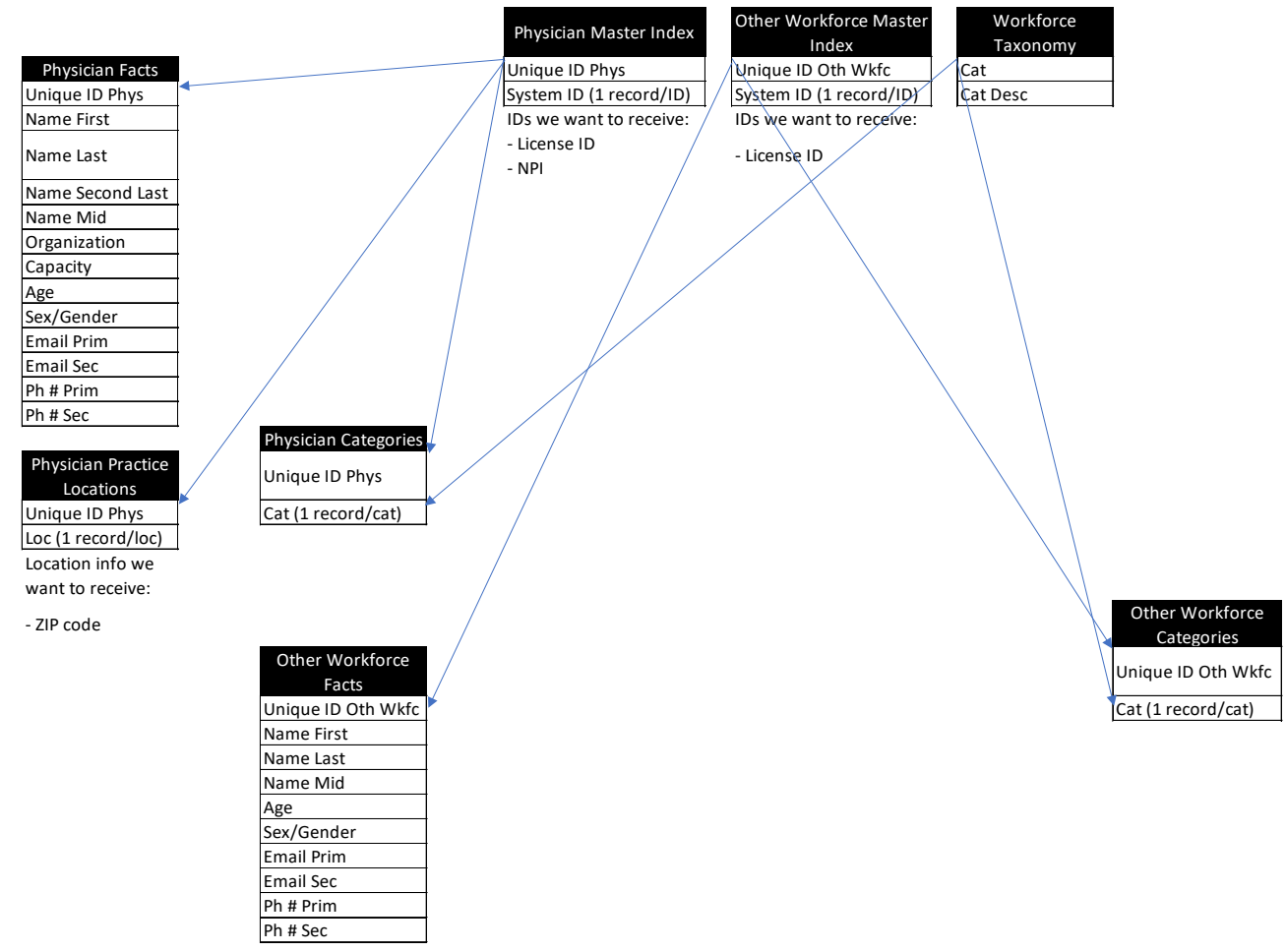
As a "module" of the APCD, or as its own information management system, we believe there is significant value in establishing a multi-dimensional database where current and historical information about healthcare professionals is maintained and available for multiple research and analysis purposes. For our study, we leveraged healthcare professional data primarily from the licensing division of the Department of Health and health insurance companies; we are aware of other healthcare professional data sources within the Department of Health and ASES. We do not believe that these data sources are ever reconciled, in our study we found issues with the completeness and quality of this data, and our impression is that the quality of this data is not systematically assessed or tested by these organizations. As such, the ability to analyze the state of healthcare professionals in Puerto Rico will continue to be challenging, and "one-off" research and analysis projects will continue to experience difficulties and generate outputs that become dated almost right after their publication.

A possible core data model for this information hub, based on how we constructed the healthcare workforce profile, is provided in Exhibit 7G.

EXHIBIT 7G. POSSIBLE DATA MODEL – HEALTHCARE PROFESSIONAL INFORMATION HUB

General notes

- Workforce: capture physician data separate from data for other workforce sectors (e.g. nurses, pharmacists, technicians); NOT including institutions
- Taxonomy: critical that this be standardized for consistent tagging of individuals to certain workforce types
- Location: municipality or rollup - PRDOH health region is the most likely rollup
- Organization [physicians]: private practice if independent vs. hospital/health system, medical group or other employer
- Capacity [physicians]: panel size, IF applicable and can be collected reliably
- Across the entire database: we will need to develop rules for "preferring" data from certain sources vs. others



Potential extensions of this data model would support:

- Capturing and enabling tracking of healthcare professional movements or departures from the workforce over time, which would support systematic, comprehensive longitudinal analysis of healthcare workforce trends, and

- Tracking and analyzing healthcare professional participation in various health coverage programs to ensure proper levels of participation and address provider network adequacy concerns as proactively as possible. As noted previously, concerns about the quality and completeness of healthcare professional data from health insurance companies prevented us from conducting an in-depth analysis of the networks of these companies to flag potential "bottlenecks". These bottlenecks would arise if the same professionals, particularly constrained specialty care practitioners, were participating in the networks of multiple insurance companies and, as such, could not possibly provide services to all of those companies' health plan members. There have been recent reports of this phenomenon, which has been characterized as "ghost networks", occurring in the U.S. which led to insurance companies being fined for provider network inadequacies[44].

Recommendation I.3: Establish a Community Health Dashboard

Leveraging the work done to gather workforce demand source data, Puerto Rico should implement a "Community Health Dashboard", a digital tool designed to visualize data related to health disparities and inequities across different population groups. This data management solution aggregates health outcomes, social determinants of health (e.g., income, education, housing), and healthcare access metrics to identify gaps and monitor progress toward achieving equity in delivery and outcomes. Key features of this dashboard could include:

- Demographic Filters: Data can be sorted by race, ethnicity, gender, age, geographic location, or socioeconomic status to highlight disparities.

- Health Outcome Indicators: Tracks specific metrics like life expectancy, disease prevalence (e.g., diabetes, heart disease), infant mortality rates, and vaccination rates across different groups.

- Social Determinants of Health: Displays data on non-medical factors such as education, employment, income inequality, housing conditions, and environmental quality, which impact health outcomes.

- Access to Care Metrics: Visualizes disparities in healthcare access, such as insurance coverage, healthcare provider availability, and use of preventive services.

- Interactive Mapping: Geographic mapping tools highlight regional disparities, such as urban vs. rural health outcomes.

- Real-Time Data Updates: Some dashboards integrate real-time data or updates from public health sources to reflect current trends.

- Actionable Insights: Potentially by leveraging artificial intelligence capabilities, the dashboard's underlying analytical engine could provide recommendations or policy options to address identified inequities and then track the impact of any implemented policies over time.

Such dashboards aim to support policymakers, healthcare providers, and community organizations in making data-driven decisions to close the gaps in health outcomes across different populations. A model for this type of information management solution is the Community Profiles information system managed by San Diego County (California's) health and human services agency[45]; Exhibit 7H provides a snapshot of one of the interactive dashboards that can be generated within this web-accessible system.

[44] https://www.npr.org/sections/shots-health-news/2024/09/21/nx-s1-5120543/mental-health-care-parity-insurance-ghost-network

[45] https://www.sandiegocounty.gov/content/sdc/hhsa/programs/phs/community_health_statistics.html

In our experience universities have been successful as a neutral body that implements and maintains this type of solution (for instance, in the aforementioned San Diego County example the University of California at San Diego plays a major role in the support of the Community Health Dashboard). Thus, we would suggest exploring establishing a Memorandum of Understanding between the FOMB, the Department of Health and the University of Puerto Rico (UPR)'s School of Medicine – in this scenario, the School of Medicine would manage and maintain the dashboarding system with their internal resources and consolidate data from multiple public data sources.

EXHIBIT 7H. EXAMPLE OF COMMUNITY HEALTH PROFILE/DASHBOARD

Recommendation I.4: Establish a Healthcare Workforce Funding Opportunity Clearinghouse

We recommend that a unit within the Government of Puerto Rico structure be charged with maintaining continuous surveillance, and ideally researching and outreaching to receive early notice, on federal funding opportunities tied to healthcare workforce development. This unit would serve as a clearinghouse of these opportunities – capture, profile, and provide all available intelligence about the opportunities to enable the appropriate entity (e.g. the previously recommended healthcare workforce development program coordinating body) or government agency (e.g. DOH, ASSMCA, UPR) that can subsequently determine whether and how to pursue the opportunities.

Recommendation I.5: Assess the Capabilities of Certain Government Entities to Successfully Manage Healthcare Workforce Funding Awards

We also have concerns about the ability of the organizations noted above to pursue and submit complete, successful applications or proposals and, thereafter, to manage the awarded funds including compliance, reporting and program evaluation requirements. However, because the scope of our study did not include a capability assessment of these entities, we recommend that such an assessment be conducted. It is critical for the government entities responsible for healthcare workforce to "rise to the challenge" of pursuing funding opportunities, managing multiple healthcare workforce initiatives proceeding concurrently, especially their ability to manage funds effectively and in a compliant manner and demonstrate the impact those initiatives are having on healthcare workforce.

BEYOND THIS STUDY

Given the many challenges facing Puerto Rico's healthcare system, beyond the healthcare workforce demand-supply imbalance, we would encourage the FOMB to commission other independent yet harmonized studies of these challenges. The goal of these studies should be to create the robust knowledge base required to develop a comprehensive, information-driven portfolio of coordinated initiatives designed to address these challenges in a holistic manner. Many of the challenges are inextricably intertwined. For instance, hospitals in Puerto Rico are struggling in part because of significant bad debt from a relatively high number of uninsured individuals whose care is not managed; this lack of management leads to excessive, higher-cost, avoidable utilization. In response, these hospitals end up competing for the scarce workforce resources that are also needed by other healthcare providers, which only exacerbates the workforce supply problem. Because of these interdependencies, the solutions to these challenges need to be coordinated and be based on a common understanding and set of facts. This is particularly critical in an environment of severely constrained funds as is clearly the case in Puerto Rico.

We strongly believe that the deliverables from this study – in particular the workforce profile and the workforce demand-supply model - are integral components of that knowledge base. Those deliverables were designed to be scalable and repurposed for studying other aspects of Puerto Rico's health care system including but not limited to:

- ✓ Evaluating the state of Puerto Rico's hospitals and other healthcare institutions – rehabilitation and other extended care facilities, nursing homes, specialized care centers such as outpatient surgery and birthing centers - and potential initiatives for aligning the capacity and mix of services available in these institutions, and the location of these institutions, to forecasted population health needs.

- ✓ Forecasting demand for services for which availability in Puerto Rico is extremely limited because historically these services have not been available even though they are sorely needed – such as LTSS/HCBS and non-emergency transportation – with the goal of modeling the impact of availability of these services on future service utilization and healthcare expenditures overall.

- ✓ Dynamically modeling the impact of increased supply of certain professionals, particularly certain high-demand and scarce specialty care practitioners, on healthcare service demand – e.g. if more effective upfront care to high-need high-cost beneficiaries is more available and accessible, how much of an impact could that have on avoidable utilization of more costly services which may also be less beneficial or even futile (applying assumptions of varying degree of aggressiveness).

- ✓ Dynamically modeling the impact of certain coordinated care models on service utilization and, as a result, workforce demand.

- ✓ Dynamically modeling the impact of certain insurance coverage and reform initiatives, including different health insurance exchange designs, on healthcare service demand and expenditures.

- ✓ Projecting the impact of potential changes in the design of the GHP on service utilization, overall expenditures and the resulting demand for healthcare workforce.

Glossary of Key Terms and Acronyms

Term	Acronym (If Applicable)	Definition and Use
Healthcare workforce		Individuals involved in the delivery of healthcare services. This includes not only doctors and nurses but also allied health professionals (like pharmacists, physical therapists, and lab technicians), administrative staff, support staff (like janitors, food service workers in healthcare settings), and public health workers
Healthcare Workforce Profile		A comprehensive report or analysis that outlines the structure, demographics, competencies, distribution, and trends within the healthcare workforce.
Workforce Demand-Supply Model		A fundamental concept in economics that explains how the price and quantity of goods or services are determined in a market based on the interaction between the supply of the product by producers and the demand for the product by consumers In the context of the healthcare workforce, demand could represent the number of healthcare workers needed based on patient needs, while supply represents the availability of healthcare professionals.
Healthcare professional		A broad term that refers to any person who is trained, licensed, or certified to provide health-related services to patients. This includes clinical and non-clinical staff who work in various capacities within the healthcare system to improve or maintain the health of individuals.
Healthcare practitioner		A more specific term that typically refers to someone who is directly involved in providing clinical care to patients.
Key Informant Interview	KII	A qualitative research method used to gather detailed information from individuals who are particularly knowledgeable about a specific topic, community, or organization.
Core Advisory Team		A small, focused group of experts, stakeholders, or key decision-makers who provide strategic guidance and oversight throughout the study process.
Raw count		Refers to the simple, unadjusted total number of healthcare professionals in a given dataset or population. This count represents the actual number of individuals without any additional filtering, such as accounting for their specialties, geographic location, workload, or hours worked.
Workforce taxonomy		Refers to a structured classification system that organizes and categorizes the various roles, functions, and job types within a workforce. For example, a workforce taxonomy might distinguish between physicians, nurses, technicians, and administrative staff based on their specific roles and qualifications.
Primary care practitioner	PCP	Healthcare professional who serves as the first point of contact for patients seeking medical care. PCPs provide general health services, including preventive care, diagnosing and treating common illnesses and conditions, managing chronic diseases, and coordinating specialized care when needed.
Specialty care practitioner	SCP	Healthcare professional who has advanced training and expertise in a specific area of medicine or healthcare. Unlike primary care providers who offer general medical care, specialist care providers focus on diagnosing, treating, and managing complex or specific health conditions within their specialty.

Term	Acronym (If Applicable)	Definition and Use
Allied Health Care Professional		Trained healthcare provider who works in collaboration with physicians, nurses, and other medical staff to deliver a range of health-related services. Allied health care professionals include a wide variety of specialists, such as physical therapists, occupational therapists, medical laboratory technologists, radiographers, speech-language pathologists, dietitians, and respiratory therapists.
Healthcare administrator		Professional responsible for overseeing the daily operations and management of healthcare facilities, such as hospitals, clinics, nursing homes, or healthcare systems.
Healthcare support resource		individual, tool, service, or system that provides assistance or supplementary care to healthcare providers and patients. Healthcare support resources may include personnel like medical assistants, administrative staff, or care coordinators, as well as technologies like electronic health records (EHR) systems, telehealth platforms, and decision support tools.
Undergraduate Medical Education	UME	The initial phase of formal training that aspiring physicians undergo before becoming licensed medical practitioners. UME provides the foundational knowledge and competencies needed to practice medicine, including classroom-based learning, laboratory work, and hands-on clinical experiences in various medical specialties.
Graduate Medical Education	GME	The formal medical training that occurs after a student graduates from medical school and earns their MD or DO degree. This period includes residency and, in many cases, fellowship programs, which are designed to provide in-depth clinical training in a chosen specialty or subspecialty
Medical resident		Physician who has completed medical school and is undergoing specialized training in a specific area of medicine, such as surgery, internal medicine, pediatrics, or others.
Health coverage program		An organized plan or policy designed to help individuals pay for healthcare services.
Health insurance company		A system or plan that provides individuals or groups with financial protection against healthcare costs. Participants pay premiums (usually monthly) to the program in exchange for coverage of certain medical expenses, such as doctor visits, hospital stays, prescription drugs, and preventive care.
Government Health Plan ("Plan Vital")	GHP	The health coverage program operated by the Government of Puerto Rico; the Health Insurance Administration (ASES) administers the program. The GHP is funded primarily by federal Medicaid and Children's Health Insurance Program (CHIP) funds matched with Government of Puerto Rico funds. Given that federal Medicaid and CHIP funds are used for this program, the Government of Puerto Rico must adhere to applicable Medicaid and CHIP laws and regulations and must maintain "state plans" for each programs as required by the federal government.
Medicare Platino		A special type of Medicare Advantage plan (Part C) offered in Puerto Rico for residents who quality for both Medicare and Medicaid (dual eligible beneficiaries). It provides additional benefits to eligible low-income beneficiaries beyond what is covered by traditional Medicare.
TRICARE (formerly known as CHAMPUS)		A healthcare program of the U.S. Department of Defense Military Health System that provides comprehensive medical coverage for active-duty and retired military personnel, their dependents, and some members of the National Guard and Reserves
Managed Care Organization	MCO	A type of healthcare provider or group of providers that offers managed healthcare services to individuals, typically through contracts with insurance companies or government health plans

Term	Acronym (If Applicable)	Definition and Use
Medicare Advantage Organization	MAO	A private company that contracts with the federal government to offer Medicare Advantage (Part C) plans to beneficiaries
Program of All-Inclusive Care for the Elderly	PACE	A comprehensive healthcare program designed to provide coordinated medical and social services for elderly individuals, particularly those who are frail and often require assistance with daily activities.
Long-Term Services and Supports	LTTSS	Refers to a range of services and supports designed to help individuals with chronic illnesses, disabilities, or functional limitations to live independently and maintain their quality of life
Home and Community-Based Services	HCBS	A specific subset of LTTSS that allow individuals to receive care and support in their homes or community settings rather than in institutional facilities like nursing homes or hospitals.
Oficina de Reglamentación y Certificación de los Profesionales de Salud	ORCPS	The office within the PR Department of Health responsible for regulating and certifying healthcare professionals
Pipeline		Refers to the educational and training pathway that aspiring physicians follow to become licensed medical doctors
Reimbursement		The process by which a payer, such as an insurance company or government program, compensates healthcare providers for services rendered to patient
High-Need, High-Cost (High-Cost, High-Need)		Refers to a group of individuals who require extensive medical care and services due to complex health conditions, disabilities, or chronic illnesses. This population typically incurs significantly higher healthcare costs compared to the general population.
Administración de Seguros de Salud (Health Insurance Administration)	ASES	It is a governmental agency responsible for managing and overseeing the healthcare insurance programs in the territory, primarily focusing on the **Medicaid** and **Medicare** programs.
Administración de Servicios de Salud Mental y Contra la Adicción	ASSMCA	It is a governmental agency in Puerto Rico responsible for overseeing and providing mental health and substance use disorder services across the territory.
Social Vulnerability Index	SVI	Refers to the increased likelihood of experiencing adverse outcomes due to social, economic, and environmental factors
Non Emergency Transportation	NEMT	Refers to transportation services provided to individuals who require assistance getting to medical appointments or other health-related services but do not have an urgent or life-threatening medical condition that requires immediate transport via emergency services.
All Payer Claims Database	APCD	A comprehensive data repository that collects and aggregates health insurance claims data from multiple payers, including private insurers, public programs like Medicare and Medicaid, and sometimes self-pay sources.
Health Information Technology	HIT	Refers to the electronic systems and tools used to manage healthcare data, facilitate the exchange of health information, and improve the delivery of healthcare services.

Term	Acronym (If Applicable)	Definition and Use
Health Information Exchange	HIE	Refers to the electronic sharing of health information among different healthcare organizations and providers to improve the quality, safety, and efficiency of patient care.

Appendix A: Workforce Profile Report

Appendix B: Key Informant Interview Report

Appendix C: Workforce Survey Report

Appendix D: Workforce Demand-Supply Model Report

Appendix E: Recommendation Matrix

Financial Oversight & Management Board for Puerto Rico

Puerto Rico healthcare workforce profile - artifact build, features and maintenance recommendations

July 11, 2024

FTI CONSULTING™

Refresher: what is the healthcare workforce profile?

The profile can be an asset that serves multiple purposes once it is built.

The profile can help resolve discrepancies and completeness issues that exist in current Government healthcare workforce data sources.

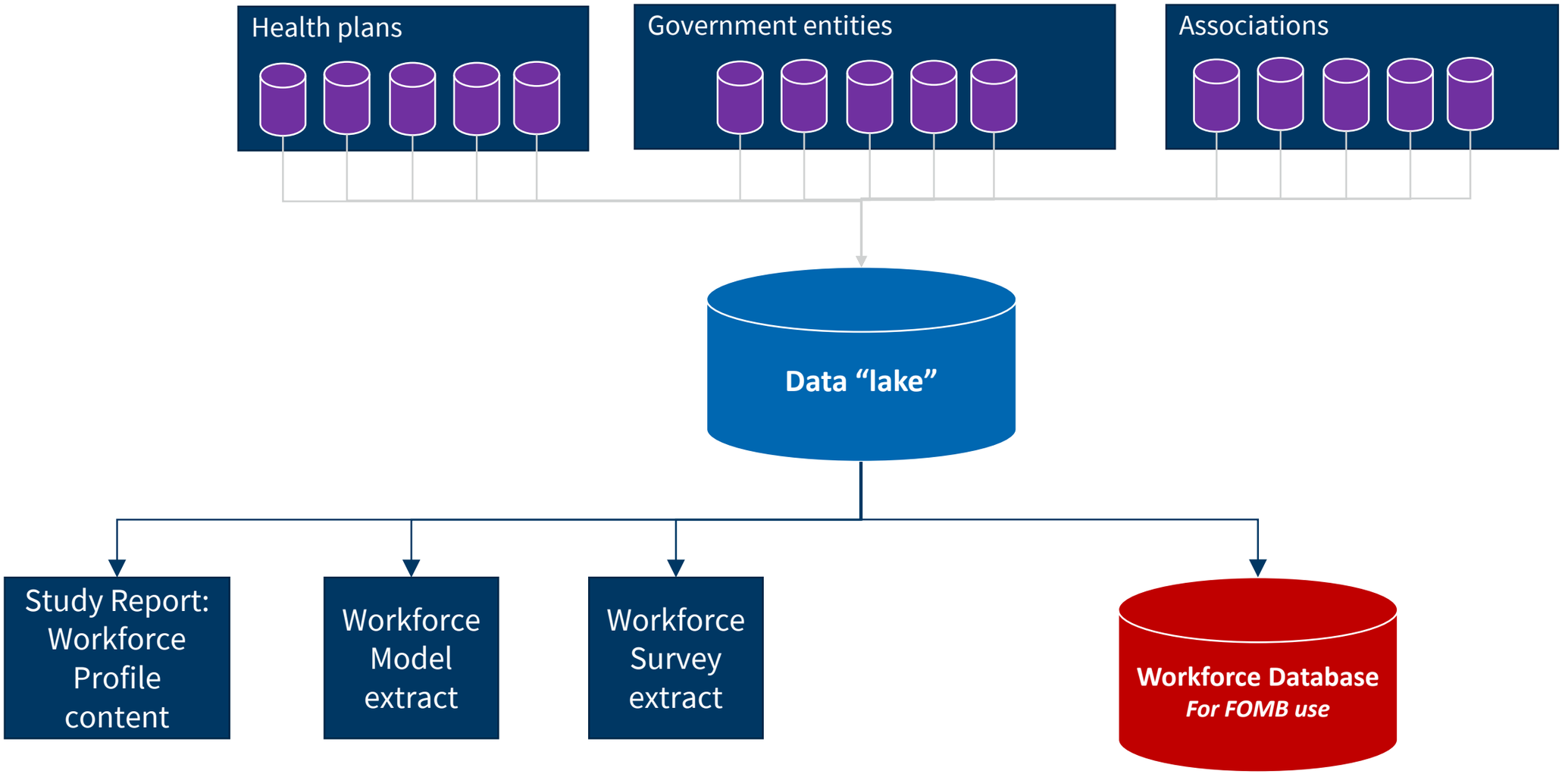
The profile will enable projecting changes in workforce availability and capacity over time.

The profile will enable informed public policy and budget decisions re: workforce availability and capacity.

- Database that captures key attributes of the workforce including:
  - Category: physicians (including physician extenders), nurses, allied health ("technicians"), administrators
  - Subcategory (e.g., physician specialty)
  - Location(s)
  - Demographics (e.g., age and gender)
  - Program participation (e.g., Medicaid, Medicare Advantage, Commercial) for some categories

- Going into the project, the FTI team recognized it would need to link data from multiple sources to create unique records of **healthcare professionals**, and in the process:
  - Develop algorithms for rating and ranking data from distinct sources
  - Create/establish unique IDs for distinct healthcare professional records
  - Validate that multiple records across data sources or even within a single data source correspond to one individual
  - Identify and resolve errors through extensive data scrubbing/cleaning

Healthcare workforce profile artifact architecture



Healthcare workforce profile construction process

DATA CASE

- Reviewed and processed 17 files containing exclusively detailed healthcare professional data, sourced from 11 different suppliers
- Re-processed files from five different health plans – seven files with more than 120,000 records

DATA ROOM FLUX

- First file received: May 21, 2024
- Last file received: June 25, 2024

COMPILATION PROCESS (1 OF 2)

- Recorded which payors/departments had provided us information and who was still pending.
- Standardized columns across all sources (available at that time), including reconciling different names, sequence, and types of information.
- Identified from the available data which was critical vs. "nice to have".
- Started database compilation using available information.
- Sent follow-up emails to payors that had not submitted data by the deadline or had to resend critical data.
- Tried to complete missing data for physicians by cross-referencing other databases (i.e., if an NPI lacked a name but appeared elsewhere, use that information to complete the record).
- We created four master mappings to support data synthesis and standardization: physician data, nurses and technicians, specialties and sub-specialties, states and cities, and zip codes.
- After requesting file updates, additional data were received, requiring additional cleaning, re-harmonization, and re-mapping.

~ 315k

Physicians: total number of records cleaned for NPI, full name, credentials, date of birth, age, and gender.

~ 56k

Nurses and technicians: total number of records cleaned for full name, credentials, date of birth, and age.

1,500+

Specialty and sub-specialty entries reviewed, cleaned and standardized.

1,200+

Total number of records with location data for which that data were reviewed, cleaned and standardized.

Healthcare workforce profile construction process *cont.*

COMPILATION PROCESS (2 OF 2)

- Subsequently, during our review, records corresponding to nurses and technicians were identified within physician files and recategorized.
  - In this review, specific cases were also found where the individual had multiple professions depending on the source, in which they could be categorized as either physicians or nurses & technicians. In these cases, a review was conducted against Health Department Licensing data, and a decision was made on which database to keep them. If not found in Health Department Licensing, a secondary review was conducted using publicly available sources.
- After the initial data compilation, we processed four subsequent submissions from various data suppliers to complete data cleaning, harmonization and stacking.
- Finally, two distinct extracts were generated for internal use:
  - Workforce Survey, consisting of i) physicians, ii) nurses and technicians, and iii) service administrators which included contact information and attributes used to establish statistically valid sample sizes
  - Workforce Model, in which records were segmented into i) physicians, ii) nurses, iii) technicians, and iv) service administrators, with attributes that will be employed to ascertain workforce adequacy and supply-availability gaps

Challenges

Information flow: Data, including necessary updates, were received from suppliers at various stages within the compilation process, causing unplanned re-work.

Information harmonization: By design we were very accommodating re: format and field specs and we were not able to enforce particular specs; as a result, data suppliers used their own nomenclature, format, and content specs thus complicating data harmonization.

Standardization of personal data: This proved to be particularly resource-intensive and time-consuming for the standardization of individual physician names and personal data.

Incomplete information: Most data suppliers provided data which was incomplete and, clearly, not validated or QA'd sufficiently prior to submission - e.g. critical fields were not populated. This resulted in repeated requests and restarting data cleaning/harmonization processes.

Recommendations

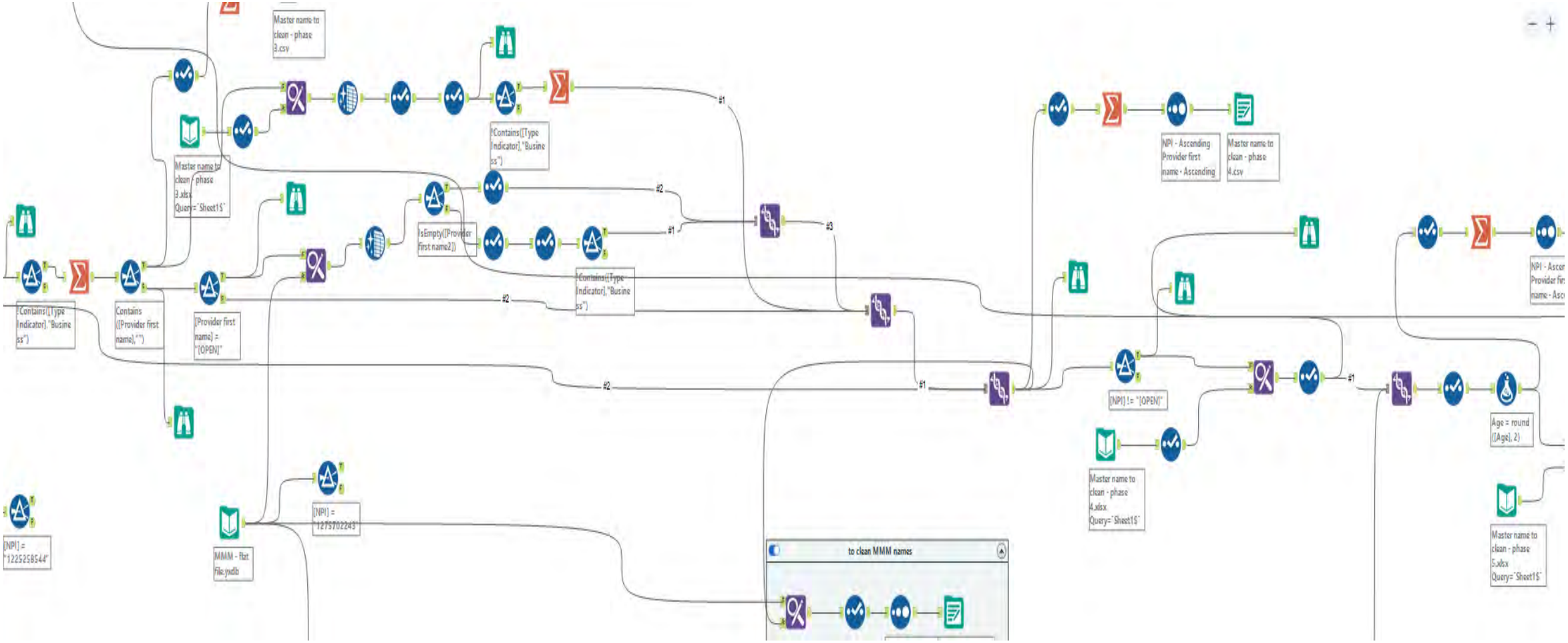
- **The Department of Health should establish a focal point for the collection of harmonized healthcare professional data that supports multiple "downstream" functions, including but not limited to updates to provider licensing data and analysis of workforce adequacy at the macro level.** Ideally this collection effort would be streamlined to the maximum degree possible so that data suppliers would not be burdened with creating highly customized files to meet the requirements of different governance bodies.
- **An interagency working group should be charged with establishing file format and field specifications, including valid values for certain data elements and standardized taxonomies and mappings** that different suppliers must adhere to and validate before submitting healthcare workforce data. This includes, for instance, standardizing demographic and location data.
- Establish and enforce submission frequency expectations and conduct systematic **quality reviews** of submitted data, both of which should be tied to fines/penalties.

The table below is provided solely for illustrative purposes.

NPI	First name	Middle name	Last name	Credential	Gender	Date of birth	Age
X298469386	JANE	DEL	DOE HERNÁNDEZ	MD	F	4/16/1950	51
	JANE	DEL CARMEN	DOE-HERNANDEZ	MD	M	4/16/1950	74
X298469386	JANE DEL CARMEN		DOE	[OPEN]	[OPEN]	[OPEN]	[OPEN]
X298469386	JANE	DEL	DOE	MD	[OPEN]	16/4/1950	[OPEN]
X298469386	JANE	DEL C	HERNANDEZ	[OPEN]	F	4/16/1950	74

NPI	First name	Middle name	Last name	Credential	Gender	Date of birth	Age
X298469386	JANE	DEL CARMEN	DOE HERNANDEZ	MD	F	4/16/1950	74

Healthcare workforce profile construction process *cont.*



Healthcare workforce profile – key statistics

Specialty	Number of records
Professional with doctorate	**20,083**
General medicine	8,329
Internal medicine	2,466
Psychiatrist/psychologist	2,217
Pediatric	1,089
Obstetrics and gynecology	528
Surgery	409
Other specialists of interest	2,154
Other specialists	2,891
Nurses	**47,609**
Generalist nurse	37,740
Specialist nurse	9,869
Allied health professionals	**3,472**
Respiratory - therapist/ technician	1,317
Physical therapist	1,200
Behavioral & mental health	489
Other therapist/ technician	466
Total records in the database	**71,164**

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2024

Puerto Rico Healthcare Workforce Study

FINANCIAL OVERSIGHT & MANAGEMENT BOARD FOR PUERTO RICO

REPORT

Puerto Rico Healthcare Workforce Study: Key Informant Interviews Report

PREPARED FOR:

Financial Oversight & Management Board for Puerto Rico (FOMB)

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PREPARED BY:

FTI Consulting (**www.fticonsulting.com/**)

Impactivo Consulting (**www.impactivo.com**)

AUTHORS:

Maria Levis, Annie Mayol, Juan Montañez. Waleska Crespo, Sofia Ortiz & Dharma Cortes.

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Table of Contents

Introduction

As part of the larger mixed-methods Puerto Rico Healthcare Workforce Study, we conducted semi-structured interviews with local stakeholders to better understand the current state and future needs of the healthcare workforce. A qualitative research approach using key informant interviews and focus groups was utilized to gain an in-depth, contextualized understanding from diverse stakeholder perspectives. This method allowed for capturing nuanced views and experiences, which are essential for comprehensively understanding the phenomenon.

Justification for this Qualitative Approach

- Rich Data: Qualitative methods offer rich, detailed data that help reveal and understand the complexities of workforce issues.
- Stakeholder Perspectives: Engaging a variety of stakeholders ensures that multiple perspectives are considered, leading to more comprehensive insights.
- Contextual Understanding: Understanding the context-specific challenges and opportunities helps inform and tailor interventions to the unique needs of Puerto Rico's healthcare system.

Research Objectives

The research objectives of this qualitative component of the Puerto Rico Healthcare Workforce Study were to:

- Identify gaps, magnitude, and causes of workforce shortages, especially in high-demand sectors;
- Explore healthcare professional retention and migration patterns to and from Puerto Rico;
- Understand future demand based on economic and demographic changes; and
- Inform the design of a quantitative survey instrument.

Methods

Development of the Interview Guide

For this qualitative study, an interview/focus group guide was designed to assess main areas related to the status of the healthcare workforce in Puerto Rico:

(1) Gaps in the healthcare workforce in PR;

(2) Factors contributing to staff shortages; and

(3) Potential solutions and future outlook.

The guide was developed by an English-Spanish bilingual research team comprising health systems subject matter experts and doctorate-level experienced qualitative researchers. Each area contained key open-ended questions supplemented with probing questions designed to elicit detailed narratives from interviewees (See Appendix A: Interview Guides).

Three versions of the guide were created to accommodate to different stakeholder sectors:

- Healthcare Providers: Those involved in direct patient care, including physicians and nurses.
- Health Professions Education Leaders: Those involved in leading the education of health professionals, including presidents, deans and program directors of higher education programs.
- Healthcare Industry Leaders: Executives and managers of health sector organizations, including government leaders, association leaders, and members of the c-suite of hospitals, health systems, insurers, physician groups, and primary care providers.

While the core questions remained consistent across all versions, the probes were tailored to reflect the specific roles and responsibilities of individuals in these three stakeholder sectors. This approach ensured that the questions were relevant and meaningful, thereby facilitating collection of rich context-specific data.

Participant Selection

A critical case sampling approach was used to gather information on the current status of the healthcare workforce in Puerto Rico from key stakeholders who could provide specific perspectives and insights based on the roles they played in the planning and delivery of healthcare-related services. The stakeholder groups were drawn from the following groups: Physicians, Nurses, Hospitals, Primary Care Groups, Health Systems, Insurers, Associations, and Government Agencies. Stakeholder groups were selected using a purposive and snowball sampling approach, which involved initially contacting well connected individuals with a broad understanding of the Puerto Rico health and healthcare delivery system. Additional participants were recruited based on recommendations from initial informants. Stakeholders were primarily approached through their respective associations or organizations, which were responsible for selecting the individuals who participated in the group interviews. A total of 21 stakeholder groups were identified for interviews and specific individuals representing the experiences of those stakeholder groups were invited to participate in a group interview. Potential interview participants were invited via phone calls and emails. All the interviews were scheduled between April to June 2024.

Interviews

Twenty out of the 21 semi-structured in-depth key informant interviews were conducted in Spanish. A total of 60 key informants were interviewed. The group interviews were conducted by four researchers with a background in health systems research in person and remotely via Zoom. They lasted between 45 to 120 minutes. A total of 13 were audio-recorded and transcribed. Transcriptions were generated using ChatGPT 4.0 artificial intelligence and quality-checked by a researcher. All participants were asked to provide verbal consent prior to initiating the interview process. For those group interviews that participants opted out from being audio-recorded, extensive detailed notes were taken using a *Data Gathering Tool* during the interview

process by two researchers. Additionally, one stakeholder group opted for providing written answers to interview questions.

All data (audio, transcripts, notes) were securely stored in a Dropbox folder for this purpose and transcripts were de-identified from personal identifiable information before they were shared for analysis.

Data Analysis

A senior qualitative researcher who had participated in the data collection process developed a preliminary *Summary of observations/takeaways*. This summary was presented to the entire research team for initial feedback. The primary purpose of this summary was to identify gaps in information that could be addressed through the survey component of this study. These gaps were identified and subsequently discussed with the survey team, and they incorporated them into the survey design. (See Appendix B – Summary of observations/takeaways)

To ensure a thorough and unbiased data analysis, a senior qualitative researcher who had not participated in data collection analyzed the narratives collected through the interviews using the six-step thematic analysis approach recommended by Braun and Clarke (2006). The six steps are:

1. Becoming familiar with the data;
2. Generating initial codes;
3. Searching for themes;
4. Reviewing themes;
5. Defining and naming themes; and
6. Producing a report.

After reviewing interview transcripts and the thematic domains included in the interview guide, this senior qualitative researcher produced an initial qualitative code tree (steps 1 and 2). The final coding tree emerged from a combination of a deductive approach (using codes developed in advance from interview guides and the preliminary *Summary of observations/takeaways*) and inductive approach (using open coding) in discussion with the entire research team.

The transcribed interviews and notes taken during interviews were coded using Dedoose Qualitative Software (Lieber et al., 2011). This software facilitates systematic qualitative data coding and analysis.

Upon completing the coding process (i.e., organizing and categorizing raw qualitative data into manageable units through assignment of codes or labels or tags assigned to specific pieces of data) a senior qualitative researcher searched, reviewed, and defined themes (steps 3, 4, and 5) using a conceptual framework that organizes factors influencing healthcare workforce dynamics into three categories: (1) macro-level factors (i.e., systemic factors that influence the healthcare system as a whole); (2) meso-level factors (i.e., macro-micro bridging organizational and community-level dynamics); and (3) micro-level factors, which involve individual and immediate interpersonal interactions within the healthcare system. The process of defining themes is known as thematic analysis and it involves identifying, analyzing, and reporting patterns (themes) within qualitative data. In other words, it is a step further from coding which is used to categorize and organize collected narratives. Thematic analysis builds on coding to

provide a deeper and more interpretative understanding of the data's underlying themes and patterns. The lead author and the senior qualitative researcher met to review the coded data to generate themes. This process resulted in the identification of four thematic domains:

- Domain 1: Gaps between supply-demand of health services
- Domain 2: Factors driving the gaps
- Domain 3: Drivers of workforce retention and migration
- Domain 4: Potential solutions and future outlook

These findings were presented to the Core Advisory Group for further feedback which was incorporated into the findings and discussion section of this report. ChatGPT 4o was used to support with writing the report after all the information was analyzed. Specific prompts were provided to ensure the confidentiality of the information. An audit trail was maintained to document all study procedures, data collection circumstances, and analytic decisions.

Key Findings and Results

Data coding

A total of 694 excerpts were coded for relevance to the research objectives from the interviews, distributed across four domains. The domain with the highest proportion of coded excerpts was Domain 2 and the one with the lowest proportion of coded excerpts was Domain 4. This coding distribution suggests that participants had more to say about factors responsible for shortages compared to the two other domains. Also, the higher number of excerpts coded under Domain 2 indicates that understanding the reasons behind staff shortages was a primary concern for the stakeholders involved.

Data Saturation and Triangulation

During the data collection process, we reached a point of saturation where information and insights shared by interview participants were being repeated. Despite the diverse backgrounds and roles of the participants, they consistently identified and pointed to similar factors contributing to the healthcare workforce issues in Puerto Rico. Although the underlying mechanisms were described from different perspectives, the core issues remained consistent across stakeholders.

The data demonstrated a high degree of convergence, indicating that participants were largely on the same page regarding the key challenges and potential solutions for the healthcare workforce. This convergence was evident when triangulating the data, which involved comparing and cross-verifying information from different sources and perspectives. Triangulation confirmed that the themes identified were robust and reflected a shared understanding among the participants.

The significant overlap in responses suggests a recognition of the similar imbalances within the healthcare workforce across stakeholder groups. This homogeneity suggests a high level of face validity of the findings presented here and underscores critical areas that need to be addressed to improve the healthcare system in Puerto Rico.

We also identified some points of divergence. These areas of differing opinions and perspectives suggest that there are numerous aspects of the healthcare workforce that require further study.

These divergences highlight the complexity of the issues at hand and imply that while there is broad agreement on many factors, there are still nuanced aspects that need more in-depth exploration. Understanding these divergent views will be essential for developing comprehensive strategies that address all dimensions of the healthcare workforce challenges and include multiple stakeholders.

Thematic analysis

The themes that emerged from the analyzed data are presented below and organized by major domains and themes within each of the three overarching study objectives (Table 1).

Table 1 - Research Objectives and Major Qualitative Themes

Research Objectives	Themes
Objective 1: *Identify gaps, magnitude, and causes of shortages, especially in high-demand sectors*	*Domain 1: Gaps between supply-demand of health services* Theme 1.1: Severity of the healthcare access problem Theme 1.2: Increased population illness Theme 1.3: Access is a systemwide problem Theme 1.4: Challenges with recruitment of health professionals Theme 1.5: Complex interplay of interrelated factors impact supply and demand *Domain 2: Factors driving the gaps* <u>Factors impacting supply of trained health professionals</u> Theme 2.1: Access to training and clinical experience Theme 2.2: Lower recruitment incentives Theme 2.3: Barriers to licensing and credentialling Theme 2.4: Need for on-the-job training for new graduates <u>Factors impacting retention of health professionals</u> Theme 2.5: Low and unstable reimbursement Theme 2.6: Uncompensated administrative burden Theme 2.7: Working conditions and burn-out <u>Factors impacting employer demand</u> Theme 2.8: Fragmented patient care Theme 2.9: Barriers to technology and interoperability Theme 2.10: Multigenerational dynamics Theme 2.11: Protectionist Practices and Regulations

	<u>Factors impacting patient demand</u> Theme 2.12: Unintended consequences of well meaning policies Theme 2.13: Complexity of patients's living conditions Theme 2.14: Minimal investment in primary care and prevention
Objective 2: *Explore healthcare professional retention and migration patterns to/from Puerto Rico*	*Domain 3: Drivers of workforce retention and migration* Theme 3.1: *Medicare and Medicaid Funding Disparities* Theme 3.2: *Wage Index Differentials* Theme 3.3: *Stateside Shortages* Theme 3.4: *Residencies & Fellowshjps* Theme 3.5: *Recruitment packages* Theme 3.6: *Professional Progress and Research* Theme 3.7: *Quality of Life*
Objective 3: *Understand future demand based on economic and demographic changes*	*Domain 4: Potential solutions and future outlook* Theme 4.1: *Supply side* - *Federal funds parity* - *Increased investment in residencies and fellowships* - Incentives for Medical School Students and Graduates - Increasing Investment in High-Quality Nursing - Enabling Funding for Workplace Learning - Enhancing Stable Reimbursement and Incentives for Providers - Revamping the Licensing Process - Uniform and Streamlined Administrative and Payment Processes - *Specialty consults and care coordination* - *Address Burnout* - *Nurses Staffing Plans* *Theme 4.2: Demand side* - *Specialty Consults and Care Coordination* - *Investments in interoperability* - *Investments in infrastructure and utilities* - *Payment reform: Value-based payments* - *Investment in Integrated and Alternative Care Models* - *Addressing burn-out* - *Leveraging Innovation and Technology to Improve Patient Health* - *Strengthening primary care* - *Long-term care* - *Investments in community-based prevention & social supports* - *Focus on Quality of Life* - *Collaboration and Multistakeholder Planning*

A detailed description of each theme drawn from the key informant interviews is provided in Appendix C – Detailed description of themes.

Discussion

This report highlights the multifaceted nature of healthcare access issues in Puerto Rico, emphasizing the need for systemic solutions that address both the shortage of healthcare professionals and the broader socioeconomic factors impacting patient health.

A severe healthcare access problem

There is widespread agreement among key stakeholders that Puerto Rico faces a major challenge in providing adequate **access to healthcare services**. Patients experience long wait times across all medical specialties, creating serious delays in receiving care which leads to increases in morbidity and mortality which further strain the system. However, the factors that contribute to this healthcare access problem are not limited to a shortage of physicians. The situation is far more complicated, with several interconnected issues making it difficult for people to get the medical attention they need.

One significant point raised by physicians is that the healthcare access problem isn't just about doctors—it **affects the entire healthcare system**. The workforce issues extend to nurses, technicians, healthcare facilities, and other vital healthcare staff. A physician described the problem in the following way:

> *"We have the problem with our nurses who are our right hands; they are the ones who execute our orders. They are demoralized, poorly paid, equally under work pressures, doing double shifts with little income, handling many patients per shift, and so on. They are in the day-to-day operations of the hospital. This staff is becoming scarce in Puerto Rico hospitals, which means hospitals can't function… The hospital is where procedures are performed that the doctor cannot do in the office. The concept of the hospital is the extension of the doctor's practice, and if there is no staff, no technology, no large machines or instruments, then the doctor cannot perform these procedures, which also reduces their medical practice income or motivation. It's like a* ***domino effect****. We also need technicians, like electrocardiography technicians for hospital procedures and respiratory technicians for managing respirators. If these technicians are not available in Puerto Rico, are not well paid, or are mistreated like the nurses, they leave. Nurses have an escape route with incentives from the United States offering great alternatives and advantages, so they leave, abandoning Puerto Rico. I find myself in some hospitals without anyone to perform studies or procedures."*

This highlights how multiple challenges feed into one another, creating a cycle that worsens the problem. To add to the complexity, the fact is that Puerto Rico has a surplus of licensed nurses[i], yet, there is a consensus among healthcare providers that there is a shortage of nurses in hospitals. This is partly due to financial strain on these healthcare facilities, exacerbated by the high cost of operating in Puerto Rico, especially with the rising cost of utilities. So, while there there are more nurses licensed in Puerto Rico than the system appears to need, these nurses may

not be practicing, or may be affected by hospital layoffs due to budget constraints which limit staff available to care for patients.

The healthcare access issue in Puerto Rico, then, is not simply about a mismatch between the number of doctors and patients—it is a **multi-layered systemic problem** involving many aspects impacting the healthcare workforce, the financial viability of healthcare institutions and the lack of care coordination. This can directly undermine the capacity to implement integrated and cohesive care plans, resulting in disjointed communication among providers and diminished continuity of care for patients. To fully understand and address this problem, it's crucial to examine the gaps between the supply and demand for health services; the factors driving these shortages, including education, recruitment, workplace conditions, market inefficiencies, reimbursement, administrative burden and quality of life and; the impact of broader issues such as healthcare professional retention, migration, and economic pressures. This discussion also considers future solutions that enhance both the supply and demand sides through incentives, innovation, technology, and strengthened care models.

Structure of the access problem

Supply of trained professionals in an internally reliant system

Puerto Rico faces a unique challenge when it comes to ensuring there are enough trained healthcare professionals, particularly physician specialists. The island operates as what we can call an **internally reliant system**, which means that healthcare professionals trained in the United States find it difficult to work in Puerto Rico. This is due to several factors, including language barriers, local regulations, and the low reimbursement for those practicing medicine on the island compared with the States.

The greatest gaps in supply are seen in physician specialties. In most cases, unless a doctor completes their residency in Puerto Rico, it is unlikely that they will return to practice on the Island. This problem is made worse because there are not enough residency slots for all the students graduating from Puerto Rico's four medical schools, forcing approximately half of them to leave the island to finish their training. Additionally, some subspecialty residencies are not available on the Island. Once a medical student leaves, it becomes difficult to bring them back, especially given that salaries are often much higher in the mainland U.S. than they are in Puerto Rico, and medical students generally have significant student loans to pay. Additionally, as mentioned by an informant, "developing residency programs that meet ACGME accreditation standards is not only complex but also extremely costly. Without adequate [up front and recurrent] funding, it's nearly impossible to maintain these programs at the required level." This includes providing a competitive salary and/or benefits to residency program faculty.

In addition to addressing this **residency bottleneck**, Puerto Rico's healthcare system also needs a better workforce planning system. Workforce planning involves anticipating the future needs of the healthcare system and aligning training programs to meet those needs. Workforce planning helps identify the types of professionals needed in both the short and long term. For example, while immediate shortages might focus on specialists or advanced practice nurses, long-term planning might reveal the need for more public health professionals, mental health workers, or technicians as demographic shifts occur and public health priorities change. Aligning training

programs with these projections is essential for ensuring that the healthcare system has a sustainable and appropriately skilled workforce in the future.

Informants noted that new medical school graduates, particularly those who have not undergone rigorous residency programs, may not be fully prepared to meet the demands of primary care. This lack of readiness impacts the quality of care and forces the system to compensate for these deficiencies. A similar case was noted for nurses who have only received simulation training. Informants cited the need to provide additional training to these general physicians and nurses to integrate them to care teams and retain them. In addition to increasing operational costs for healthcare facilities, this issue imposes additional strain on the workforce, requiring healthcare professionals to assume greater workloads to compensate for gaps in training and expertise. This heightened demand can contribute to burnout and compromise the quality of care, further exacerbating systemic challenges. The pipeline for healthcare professions begins in high school, but many students do not receive adequate guidance or develop the skills needed to these pursue careers. Those who are interested in health professions often face financial challenges and may struggle to see how taking on significant debt for a healthcare degree will benefit them in the long term. Furthermore, the process of obtaining licenses and credentials can be slow and complicated, delaying their entry into the workforce. To retain more healthcare professionals on the island, it's crucial to create a **streamlined pathway from education to employment**, ensuring graduates can secure stable income quickly. This would help counter the competitive offers they receive from stateside organizations, making it more attractive for them to stay and work in Puerto Rico.

Retention of trained health professionals

The shortage of healthcare workers in Puerto Rico must be understood within the broader context of healthcare in the United States (U.S.). The U.S. is facing a projected shortage of around 124,000 doctors and 1.1 million nurses by 2034[ii]. Because professionals trained in Puerto Rico in academic programs accredited and following the same regulations in U.S., are often bilingual and well-suited to meet the needs of the growing Hispanic population in the U.S., they are aggressively recruited by mainland healthcare organizations.

The situation is made worse by a substantial wage gap between what healthcare professionals earn in Puerto Rico compared to those in the 50 states. In Puerto Rico, unlike in most U.S. states, Medicare tends to be the highest-paying payer, while private payers offer some of the lowest reimbursement rates because the premiums that the local market can hold are significantly lower than those in the States. According to informants, Puerto Rico's Medicare wage index was 40.53 (2022), meaning in the best case, healthcare professionals on the island are paid only 40% of what their mainland counterparts earn. This wage gap is compounded by the fact that Puerto Rico faces higher costs for medicine and medical equipment than most states due to the cost of shipping to the Island using the U.S. Merchant Marines and are required to comply with the same regulations as providers in the States. This significant funding disparity makes it nearly impossible for Puerto Rican healthcare employers to offer salaries that can compete with those available on the mainland, driving many professionals to seek opportunities in the States.

To make matters worse, U.S. recruiters actively target Puerto Rican specialists and nurses with practical training, even before they complete their programs, offering attractive packages that include assistance with licensing, moving expenses, loan repayment, and signing bonuses. These

offers are often difficult to decline, as they promise significantly higher salaries and more stable job opportunities than professionals typically find in Puerto Rico.

In response, Puerto Rico needs to look for innovative ways to retain those who are being actively recruited. This could include securing additional financial resources through grants and stipends for healthcare students to make local opportunities more competitive. Offering loan forgiveness programs for healthcare workers who commit to staying on the island could ease the financial pressure many face, especially given the wage disparities. Without a streamlined system that helps highly sought-after professionals quickly secure well-paying sources of income that allow them to manage their loans and provide financial security for their families, these healthcare workers will continue to face a difficult decision: stay in Puerto Rico with an uncertain future or move to the States where their career seems assured.

The challenges to retaining healthcare professionals in Puerto Rico don't end once the students graduate. Specialists, advanced practices nurses, and nurses with practical experience are continually offered positions in the mainland U.S. throughout their careers. This constant recruitment pressure means more needs to be done to retain Puerto Rico's healthcare workforce. A key area for improvement is streamlining the licensure process, which is still largely managed through in-person and paper-based systems. This creates a significant barrier compared to most States where the entire process can be completed online.

It is important to note that physicians in Puerto Rico spend a significant portion of their time—about 20%—on non-clinical economic activities, which further reduces the time they can dedicate to patient care[iii]. To address these challenges, incentives should be carefully designed to increase patient access to care and participation in workforce training, particularly for underserved populations and areas. Incentives targeting key priority areas, such as rural healthcare, high need specialties based on the long-term projections of medical specialists need, and night shift staffing, could help alleviate some of these workforce shortages and improve access to care across the Island.

Healthcare workers in Puerto Rico, including nurses and allied health professionals, also face heavy workloads, often leading to burnout. Burnout rates on the island surpass those in the mainland U.S., driven by high stress levels and difficult working conditions[iv]. As a result, many professionals leave the Island or move into less demanding non-healthcare jobs within Puerto Rico, where they can earn similar pay. This further contributes to retention issues across the healthcare sector.

One physician put it succinctly: "Maintaining a balance between wellness and job satisfaction is nearly impossible under these circumstances." It's clear that workloads and working conditions need substantial improvement to reduce burnout and keep healthcare workers in their roles.

Importantly, salary is not the only reason healthcare professionals leave Puerto Rico. Many also relocate for better access to quality education for their children, lower living costs, and an overall higher quality of life elsewhere.

Healthcare access requires more than workforce: Addressing market inefficiencies

Administrative Burden and Reimbursement Complexity

Puerto Rico's healthcare system seems to face significant market inefficiencies that exacerbate its workforce challenges. One of the most pressing issues identified is the excessive amount of time physicians spend on administrative tasks. Puerto Rican doctors, on average, spend nearly twice as much time on paperwork and navigating complex payment policies as their counterparts in the mainland U.S[v]. This was cited by numerous healthcare professionals as a major cause of burnout. As one interviewee shared: "The amount of paperwork required by the insurance companies is overwhelming. It takes time away from our patients, and it feels like we're just ticking boxes instead of practicing medicine." These administrative burdens seem to detract from the time physicians can spend with patients, reducing access and contributing to job dissatisfaction and burnout.

Additionally, informants cited the unpredictable and often complex nature of payment policies which create financial instability for healthcare providers. As another interviewee noted: "The unpredictability of payment policies is one of the most frustrating aspects of dealing with insurance companies. We can't build a stable financial plan when we're constantly dealing with changes in how and when we get paid." The complexity of Puerto Rico's reimbursement process, compounded by lower reimbursement rates than those in the mainland U.S., makes it difficult for providers to cover operational costs. Even though the requirements may be like those in the States, in Puerto Rico providers do not count on the financial resources to hire additional team members to manage the administrative complexities. This situation places added financial pressure on healthcare professionals, forcing them to navigate an already administratively burdensome system without adequate resources.

Puerto Rico's reimbursement process is another significant inefficiency in the system. While the requirements for providers are similar to those in the mainland U.S., the reimbursement rates in Puerto Rico are significantly lower. This makes it difficult for healthcare providers to cover the costs associated with managing complex administrative and financial systems. As a result, providers face financial instability, which contributes to the challenges of retaining healthcare professionals on the island.

System Fragmentation

Puerto Rico's healthcare system appears to be highly fragmented, lacking the integration needed for efficient care delivery and increased access. Informants indicated that Puerto Rico operates under a siloed system, where different parts of the healthcare ecosystem function independently. This disjointed structure not only makes it harder for patients to access the care as they circle in and out of different systems trying to manage their care, it also increases the strain on the already overburdened healthcare workforce because it creates unnecessary redundancies and ineffective care. This, in turn, can lead to an increase in healthcare service costs by amplifying systemic inefficiencies and resulting in the duplication of efforts.

One of the major consequences of this fragmentation is the cited overuse of emergency rooms. Many patients unable to secure timely appointments with specialists turn to ERs, which are not equipped to manage chronic conditions. As a result, while patients are seen by a physician, their underlying health issues often go untreated. An informant explained, *"To get an appointment, we*

are so saturated that the next available slot might be in six months. Patients end up going to emergency rooms, which overcrowds the hospital system." Another interviewee added, *"Emergency rooms have become places for treating chronic conditions that could be managed with a visit to a doctor. But because doctor's appointments are so far out..."* This phenomenon is concerning because the doctor's valuable time is being spent, but the patient's chronic disease management need is not being addressed. Hospitals also report that patients arriving at ERs are in worse condition, and reimbursement for these services doesn't reflect the complexity of care. One informant shared, *"The type of patients coming to our hospitals is more complicated, and morbidity and mortality rates continue to increase."*

In addition, some inefficiencies in the referral system were cited as further contributing to delays in care. Multiple referrals are sometimes required for preventive procedures like colonoscopies which are a preventive measure with clinical guidelines, creating unnecessary barriers for patients. One healthcare provider noted, *"A colonoscopy could be done, and the results sent to me, unless there's a pathology. But this requires three referrals [and physician visits], which complicates things."* These delays not only frustrate patients but also impact outcomes, especially in cases where early detection is critical, such as cancer diagnosis. As one informant pointed out, *"Cancers are being diagnosed later, and chemotherapy is often delayed, contributing to increased mortality."*

These examples highlight the urgent need for care coordination and establishing mechanisms for specialty consults getting care to patients earlier, to prevent worsened patient outcomes.

Lack of Interoperability

Puerto Rico suffers from a severe lack of interoperability—the ability for different healthcare systems to communicate and share information. Without interoperability, there is a lack of coordination between healthcare providers, leading to waste, unnecessary procedures, and inefficient use of resources. This poor coordination of care places even more pressure on healthcare workers, who must deal with redundant labs and inefficiencies, further taxing an already strained workforce.

Unintended Consequences of Well-Meaning Policies

Informants explained that policies intended to improve the healthcare system often have unintended consequences. This is particularly true for healthcare workers like nurses and other allied health professionals. Interviewees highlighted that well-meaning policies can inadvertently lead to economic and professional challenges. These unintended consequences of policies, while well-intentioned, contribute to the challenges of recruiting and retaining skilled healthcare workers, ultimately affecting the quality and continuity of patient care.

An example of the unintended consequences of well-meaning policies can be seen in the proliferation of non-accredited nursing schools which do not require practical experience as part of the training for a registered nurse. The intention behind this was to address the nursing shortage by increasing the number of nursing graduates who could enter the workforce and meet the healthcare system's growing demands. However, while this expansion did result in more graduates, a significant portion of the graduates who are trained using only simulators are

unprepared for clinical practice, leading to an oversupply of nurses who lacked the practical skills required in hospitals. This not only failed to solve the workforce shortage but further complicated it. Additionally, the absence of differential pay for advanced practice nurses, such as oncology, and nurse practitioner discourage highly skilled nurses from entering or staying in those roles, limiting the healthcare system's ability to meet specialized care demands.

Unsustainability of the demand problem

Puerto Rico faces a growing crisis with chronic diseases such as diabetes, hypertension, and asthma, which are already at the highest incidence rates in the United States and most continue to rise[vi]. The healthcare system struggles to manage these conditions due to significant barriers to access, resulting in worsened health outcomes for patients and increased demand for healthcare services. Informants emphasized that many patients, particularly those with chronic conditions, experience delays in receiving care, and the lack of early intervention causes their health to deteriorate requiring more care.

This situation creates a cycle where patients are mostly receiving care after their conditions have worsened, often requiring more intensive—and expensive—treatments. The rise in chronic illness is unsustainable, as patients arrive at hospitals and specialists in worse health, contributing to an overburdened healthcare system. The inability to access timely care leads to higher morbidity rates, overwhelming the system and increasing pressure on healthcare providers who are already stretched thin. This situation will likely continue due to the lack of sustainable health promotion and preventive programs across the healthcare system, especially at the primary care level.

Without addressing these access issues, the burden of chronic diseases can continue to grow, further straining Puerto Rico's healthcare resources. Earlier interventions and more consistent care are crucial to preventing this negative spiral, but the system's inefficiencies make it difficult to meet the growing demand. As one informant observed, "The delays in care and lack of follow-up are driving a significant portion of the population into worse health, which in turn places even greater strain on the healthcare infrastructure."

According to the U.S. Centers for Disease Control, chronic conditions and mental health account for approximately 90% of the total health expenditure[vii]. If we assume the situation is similar in Puerto Rico, we quickly come to the conclusion that the increase in chronic conditions is unsustainable.

Potential Solutions

Puerto Rico's healthcare system faces a wide range of challenges that demand solutions to address the problems with access to healthcare services. A central theme emerging from interviews is the significant **disparity in federal funding for health** received in Puerto Rico, which is seen as the root cause of the severe workforce shortages in Puerto Rico. The island's healthcare system operates under the same federal requirements as the mainland U.S., but with significantly lower Medicare reimbursement rates and inexistent Supplemental Security Income (SSI) and Medicaid Long-Term Care benefits which significantly affect the local healthcare market, making it difficult for Puerto Rico to retain healthcare professionals and compete

financially with the mainland. Informants underscored the critical need for **federal funds parity** as a long-term solution to alleviate these financial constraints, improve healthcare access, and ensure the system can adequately serve the population.

Achieving federal funds parity would allow Puerto Rico's healthcare providers to offer competitive wages, retain skilled professionals, and reduce the current outmigration of healthcare workers. This solution requires the collaboration of all stakeholders, including local and federal government agencies, healthcare institutions, and advocacy groups, to push for the necessary legislative changes in Congress. Without addressing the funding gap or the structure of the local system, Puerto Rico's healthcare system may continue to struggle to meet the needs of its population, and the workforce shortage will likely worsen.

While federal funding parity is the most swift solution, there are several solutions within the jurisdiction of the **Commonwealth of Puerto Rico** that can have a significant impact on addressing the healthcare workforce shortage. These solutions focus on improving both the supply and retention of healthcare professionals, the administrative burden on health professionals, and improvement in care coordination to meet patient needs more effectively. The proposed solutions are summarized in the table below.

Table 1 - Summary of potential solutions

Supply-side Solutions	Demand-side Solutions
•Pipeline to placement in professions •Uniform administrative & payment processes •Tailored incentives for providers	•Patient centered integrated care models •Investments for interoperability and technology •Strengthening prevention and community supports

Supply-Side Solutions

Supply side solutions focus on ensuring that the health system trains an adequate supply of health professionals, that those professionals are retained to work on the Island, and that they are spending most of their time on patient care activities.

Some of the high-value supply side solutions that would be particularly well-suited for Puerto Rico include:

Intervention	Description	Time Frame	Cost ($ to $$$)	Impact (* to ***)
Pipeline to placement in professions	Creating a pipeline from high school to sustainable revenue generation for professionals.	Medium	$$	***
Uniform administrative	Reducing administrative burden on providers.	Medium	$	***

& payment processes				
Tailored incentives for providers	Establishing mechanisms to retain health professionals.	Short	$$$	***

1. Pipeline to Placement in Professions

A Healthcare Workforce Pipeline Commission can be established between government, academia and industry with the primary responsibility of creating an efficient pipeline that spans from high school education to revenue generation after graduation with adequate compensation. This pipeline would help ensure an adequate supply of healthcare professionals that can enter the workforce swiftly.

This commission would manage the data to enable effective workforce planning building on efforts already carried out by local educational institutions. Without a comprehensive, data-driven approach to planning, healthcare systems risk producing a workforce that doesn't have the right balance of skills or the right geographic distribution to meet the needs of the population.

Tailoring health professional training programs to the specific needs of the market ensures that students are not only equipped with the necessary skills but are also prepared to step into roles where shortages are most critical. Training programs can be offered by various entities, including corporations, non-profit organizations, government agencies, professional associations, and private training providers, in addition to academic institutions.

While formal academic institutions often provide structured programs that may lead to degrees or certifications, many training programs are designed for specific professional development, technical skills, or personal growth and are delivered outside the traditional academic setting. These can include industry-specific certifications, vocational training, workshops, online courses, and on-the-job training, which are tailored to meet practical needs and are not always linked to formal academic credentials.

By closely monitoring trends in the healthcare workforce, training institutions can adjust their curricula, expand certain programs, and ensure that students gain practical experience in areas where there is the greatest demand. This dynamic approach works towards a workforce that is better equipped to meet the evolving healthcare challenges of Puerto Rico. This would involve planning and funding for increasing the number of residency and fellowship slots, developing medical residency programs and fellowships that are currently unavailable in Puerto Rico, while also expanding and opening new academic programs for healthcare professions that are already established in the region, particularly in high-demand areas, and strategies to retain healthcare graduates on the island. Additionally, the commission could focus on providing financial support, such as scholarships and loan repayment programs, tied to commitments to work in Puerto Rico after graduation, ensuring that students are incentivized to stay and serve local populations. These programs should be available for students pursuing a healthcare profession career, not only limited to medical students, to have a comprehensive strategy to address the healthcare professional shortages. Efforts should also be carried out to leverage and maximize

the use of federal funding like the U.S. Health Resources and Services Administration's (HRSA) Loan Repayment Program, U.S. Department of Labor Workforce Investments and Medicare's Graduate Medical Education Funding that as today, is affected by the disparity in the reimbursements.

A career colleges model can be established to engage with high schools across Puerto Rico to introduce healthcare career pathway programs. There is a successful precedent in Puerto Rico of this model with the Department of Labor funded project through the Colegio de Directores Médico which was unfortunately closed because of lack of funding. The Commission could work closely with medical schools, nursing programs, and allied health schools to ensure that their curricula are aligned with the needs of Puerto Rico's healthcare system.

Another key responsibility of the commission could be to streamline the licensing and credentialing processes for healthcare professionals. Currently, these procedures are outdated and create unnecessary delays in getting new graduates into the workforce. The Commission could aim to digitize the entire licensing process, allowing for easier and faster submission of documents and real-time tracking of application statuses. By introducing an online system, healthcare professionals could avoid the traditional in-person, paper-based process. The Commission could also pursue reciprocity agreements with other U.S. states, enabling professionals licensed elsewhere to practice in Puerto Rico with minimal additional requirements. Additionally, the Commission could propose recommendations to modernize the structure of the healthcare professionals' licensing boards, ensuring that licensing exams are offered multiple times throughout the year, allowing new graduates to obtain their professional licenses promptly upon graduation. This can be particularly important for re-engaging those Puerto Rico trained physicians who live in the States and can provide services through telehealth. Furthermore, the Commission could oversee that licensing boards are fully staffed and equipped to handle the flow of new applicants, removing legislative bottlenecks that slow the process.

In terms of employment and reimbursement, the Commission could develop a placement service to match new graduates with positions in high-demand areas, such as rural healthcare facilities and hospitals. This service would also focus on advising on compensation packages that are adequate and sufficient to cover student debt, housing costs, and other quality-of-life expenses. By coordinating with healthcare employers, the commission could help tailor financial incentives, housing assistance, and salary supplements, particularly for those working in underserved areas.

Finally, the commission could be responsible for continuously monitoring and evaluating the effectiveness of the healthcare pipeline. This would involve tracking key metrics such as graduation rates, employment placements, and professional retention, and using the licensing and payer data leveraged for this project to make necessary adjustments to the pipeline. Regular reporting to government stakeholders and healthcare institutions could help ensure that the pipeline remains responsive to the evolving needs of Puerto Rico's healthcare system.

2. Uniform Administrative Processes for Payment

Administrative burden presents a significant challenge within Puerto Rico's healthcare system. Hospitals and healthcare providers on the island must comply with the same federal regulations and accreditations as those on the U.S. mainland, but they operate with significantly fewer

financial resources. One stakeholder commented, "We have lower rates but the same federal requirements. The government wants us to do more with less." This mismatch between requirements and resources to manage those requirements reduces the time that providers can spend with patients.

The complexity of payment systems further complicates matters. Variations in reimbursement premiums across different insurers and regions add another layer of difficulty. One informant pointed out the confusion surrounding reimbursement using a Risk Adjustment Factor (RAF) system, stating, "We don't know what the premium is. It's an extremely complicated system, and we're not mature enough to code." Streamlining these processes and simplifying the payment systems across providers could significantly reduce the administrative burden on healthcare providers, allowing them to focus on patient care instead of navigating complex bureaucratic procedures.

The U.S. Centers for Medicare and Medicaid Services (CMS) Innovation Center (CMMI) has established “all-payer model initiatives” in other U.S. jurisdictions. Puerto Rico could request from CMMI the development of a Puerto Rico specific “all-payer model” to streamline administrative processes and create uniformity across different insurers. CMMI funding has not been readily accessible for Puerto Rico because of the differences in the Island’s local market, and they may be open to developing a specific initiative as they have done in other States. An “all-payer model” tailored to Puerto Rico’s needs, whether or not it is funded by CMS, could allow Medicaid, Medicare, and private insurers to follow some of the same documentation and reimbursement processes, which could ensure consistency and reduce administrative burdens on providers.

Additionally, credentialling could be heavily improved through the enactment of an "Any Willing Provider" Policy whereby insurers would be required to contract all available physicians. This means that any healthcare provider meeting necessary qualifications and willing to provide services under an insurer's plan must be allowed to do so. This could help remove barriers to patient access across health plans. A uniform credentialling process could also reduce redundancy, save time, and allow for smoother practice across multiple insurance networks.

By implementing these strategies, Puerto Rico can reduce the administrative burden on healthcare providers, making the system more efficient and financially stable. These recommendations should also take note of improvement in AI to reduce the administrative burden. This would allow providers to dedicate more resources to patient care while ensuring more predictable revenue streams.

3. Tailored Incentives for Providers

To address the ongoing outmigration of healthcare professionals from Puerto Rico, developing tailored incentives is important to make it more attractive for providers to remain on the island and demonstrate a commitment to working within academic institutions to support the development of new healthcare professionals through advancing academic programs. Given Puerto Rico's inability to compete with mainland U.S. compensation levels, strategic incentives should be created for priority groups.

A preferential tax rate has been identified as a potentially effective strategy to retain and attract healthcare professionals. The previous implementation of a 4% preferential tax rate for

physicians had mixed results. While some stakeholders indicated that the incentive did not significantly increase the number of physicians on the island, others noted its importance in retaining professionals who might otherwise have left Puerto Rico or in bringing physicians out of retirement. However, concerns about compliance enforcement and a lack of data on the overall impact remain significant.

To improve the effectiveness of the tax incentive, stakeholders recommend extending a preferential tax rate—not necessarily the 4% in the original incentives—to income generated directly from providing healthcare services to priority populations or revenues from academic endeavors. This would ensure that the tax incentive is directly related to increases in healthcare access.

Another type of incentive can be "differential pay" for specialized fields like oncology nursing, where compensation is often inadequate. This would incentivize healthcare professionals to stay in these high-demand roles, addressing critical shortages. Incentives should be designed with a focus on high-demand professions that provide direct patient care, particularly for the island's most vulnerable populations.

In addition to financial incentives, addressing burnout and promoting work-life balance was noted as a top priority for all healthcare providers in the PR Health Workforce Survey. Incentives can be offered to hospitals, healthcare facilities and academic institutions for offering work-life balance incentives, such as flexible scheduling, paid time off, reducing workloads, and access to wellness and mental health services which could improve job satisfaction and reduce the likelihood of professionals leaving for better opportunities on the mainland. Creating a more supportive work environment can help retain healthcare workers and reduce the negative effects of burnout on Puerto Rico's healthcare system. Healthcare facilities that serve high priority populations or provide residencies could also benefit from other supports like reductions in utility costs and concurrent reviews by insurers.

Demand-Side Solutions

Addressing the demand for healthcare services in Puerto Rico requires a transformation of clinical practices to focus on integrated care with interprofessional healthcare teams based, improved technology, and strengthening prevention and community support. These demand-side solutions aim to enhance access, quality, and sustainability of prevention and health care for underserved populations, while simultaneously reducing healthcare costs.

While the opportunities for change are abundant, there is currently no funding mechanism to implement these necessary interventions. For this reason, we recommend the creation of a healthcare innovation fund focused on enabling this type of innovation. The governance structure mirror the one proposed in the CMS funded Puerto Rico State Health Innovation Plan (2016) which was never implemented even though it had resounding support from all system stakeholders.

Some of the high-value interventions that would be particularly well-suited for Puerto Rico include:

Intervention	Description	Time Frame	Cost ($ to $$$)	Impact (* to ***)

Patient Centered Integrated Care Models	Strengthening primary care through patient-centered medical homes, specialty consults, medical neighborhoods and long-term care.	Short to Medium	$	***
Leveraging technology	Focused on investments in telehealth and interoperability.	Medium	$$$	***
Strengthening prevention and community supports	Multiple evidence-based programs like the Diabetes Prevention Program, Ornish Lifestyle Medicine Program, Blue Zones, Community health and support services and integrated Community Health Worker interventions should be implemented.	Short	$	***

Each one of these interventions has a proven return on investment which would mean that in the long term the investment would pay for itself in the long term both in a reduced need for healthcare expenditure and increases in productivity for the Island's workforce.

Patient-Centered Integrated Care Models

Implementing patient-centered, integrated care models is essential for addressing Puerto Rico's growing burden of chronic diseases, such as diabetes, hypertension, and asthma. These conditions not only put significant strain on the healthcare system but also create an upward spiral of demand for health services. Integrated models offer a solution by focusing on coordinated, preventive care that can mitigate the worsening of chronic conditions and help prevent emergency room visits and hospitalizations.

The ***Patient-Centered Medical Home (PCMH) and Medical Neighborhood*** models are certified by the National Coalition for Quality Assurance (NCQA), the Joint Commission and AAAHC and when implemented correctly are particularly effective in managing chronic conditions by creating a network of healthcare providers, including primary care physicians, specialists, and community support services. This "neighborhood" surrounding the patient ensures comprehensive, continuous care and helps avoid the fragmentation of care that often leads to poor health outcomes.

For instance, a PCMH that integrates services for diabetes management—such as diet counseling, routine monitoring, and medication adherence—could prevent disease progression, thereby reducing the need for hospitalizations and lowering healthcare costs. A Milliman Report[viii] found that these models can reduce emergency room visits by about 70 visits per 1000 members per year when compared to non-PCMH clinics. Projected out to the Vital population, that would be a reduction of 98,768 ER visits per year, thereby curbing the demand for acute services. An implementation at Salud Integral en la Montaña in Puerto Rico has sustained improved diabetes control over a four year period and is currently being studied by researchers from Stanford and Harvard University for its effectiveness. (HRSA UDS)

The use of ***specialty consults***, including e-consults, can also play a pivotal role in reducing the demand for in-person specialist care and managing chronic diseases more efficiently. In Puerto

Rico, where access to specialists can be limited, e-consults offer a cost-effective alternative that allows primary care providers to consult with specialists remotely, instead of referring a patient to care. These doctor to doctor consults reduce the need for unnecessary referrals and improve access to specialist care, particularly for patients with chronic conditions that require regular monitoring and management. Enabling specialty consults in Puerto Rico would require that both physicians be reimbursed for the specialty consult and that communications infrastructure be established for standardized communication through a Project ECHO[ix], Project CORE or similar mechanism.

Association of American Medical Colleges found that in its first three years, Project CORE's participating institutions experienced an 84% increase in timely access to specialty care[x]. The ROI from integrating e-consults into healthcare systems is significant, as it reduces the overall cost of care by minimizing in-person visits and improving chronic disease management.

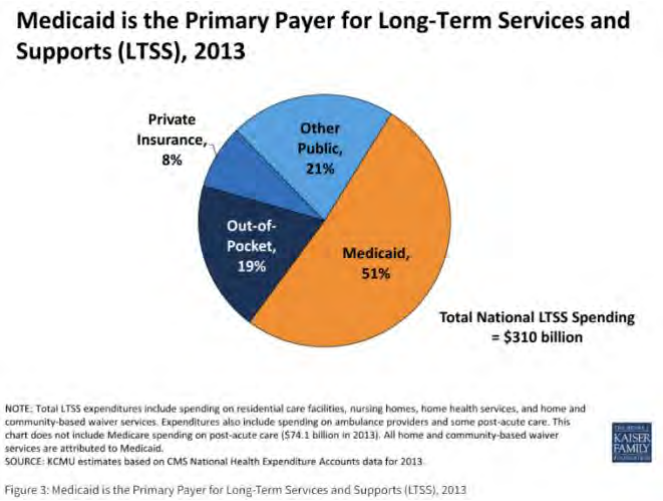


Figure 3: Medicaid is the Primary Payer for Long-Term Services and Supports (LTSS), 2013

The inclusion of Medicaid Long-Term Care (LTC) services in Puerto Rico would also improve the health of the growing population of elderly individuals with chronic diseases. LTC services help manage chronic conditions more effectively and reduce the need for hospitalizations. According to Medicaid, LTC "system offers high quality services that improve quality of life. Accountability and responsibility is shared between public and private partners and includes personal accountability and planning for long-term care needs, including greater use and awareness of private sources of funding.[xi]" This issue is critical as Medicaid is the Primary Payer for LTS and without this benefit, people living in Puerto Rico do not have these supports.

Leveraging Technology

Technology can be an important facilitator for reducing the demand of health services in Puerto Rico. Investments in these areas can enhance the coordination of care, reduce costs, and improve patient outcomes by allowing for seamless communication between healthcare providers. Some technologies driving these improvements are telemedicine/remote monitoring and interoperability, both of which are particularly valuable in rural and underserved regions.

Telemedicine offers an efficient way to overcome access barriers in underserved areas, especially rural regions where healthcare facilities are scarce. It enables healthcare providers, including specialists from the mainland U.S., to offer care without being physically present, thereby increasing accessibility for patients who otherwise might not receive timely care. One stakeholder emphasized the potential impact of this technology, stating, "We need to implement a strategy for telemedicine, allowing providers from the U.S. to serve the local population without requiring a Puerto Rican license."

A successful example of technology-driven healthcare improvement in Puerto Rico is the Optimizing Virtual Care (OVC) program implemented at Hospital General de Castañer (HGC). HGC was one of only 22 organizations across the U.S. chosen to participate in this HRSA program, which has shown tangible benefits for patients managing chronic conditions. In 2023, metrics from the OVC program revealed that patients enrolled in the program had better control over chronic conditions like diabetes and hypertension compared to the general patient population. Moreover, HGC's comparison of its top 10 high-cost, high-need (HCHN) patients enrolled in the OVC program with its top 10 HCHN patients not enrolled revealed significant cost savings. Patients in the OVC program had 73% lower healthcare costs than their non-enrolled counterparts, largely due to the reduction in unnecessary hospitalizations and emergency room visits. This evidence supports the effectiveness of virtual care in managing chronic illnesses and reducing healthcare costs for high-risk patients.

Interoperability—the ability to seamlessly share patient data across different healthcare systems—is essential to improving care coordination and reducing redundancies. When healthcare providers can access comprehensive patient records in real time, it allows for better decision-making, fewer repeated tests, and more coordinated care across specialties.

One of the biggest benefits of interoperability is its ability to reduce unnecessary tests and procedures, which can lead to significant cost savings. When healthcare providers have access to a patient's complete medical history, they avoid repeating diagnostic tests that may have already been performed by another provider. This not only cuts down on wasteful spending but also minimizes the burden on patients, who may otherwise have to undergo redundant or invasive procedures. Furthermore, the ability to share data across healthcare systems ensures that providers can make more informed decisions, improving both the quality and safety of patient care.

However, achieving full interoperability faces several technical and cultural challenges. The financial investment needed to implement and maintain interoperable systems is another significant hurdle. Healthcare institutions must not only cover the costs of adopting new technologies but also allocate resources for training staff and maintaining these systems over time. Despite these costs, the long-term benefits of interoperability—including improved patient outcomes and reduced healthcare costs—make it a worthwhile investment.

Strengthening Prevention and Community Supports

Prevention and community support systems are essential to managing healthcare costs and improving overall population health. As a respondent stated, "The government needs to have a clear policy on health prevention and promotion. We continue to think that prevention and health promotion are expensive, but in the long term, they are the most cost-effective public health strategies." Prevention, especially in managing chronic diseases like diabetes, heart disease, and hypertension, has been shown to significantly reduce healthcare utilization. Multiple evidence-based programs like the Diabetes Prevention Program (DPP), the Ornish Lifestyle Medicine Program, Blue Zones, Community Health Worker (CHW) interventions, and Community Health and Support Services offer tremendous potential to address the growing demand for healthcare services in Puerto Rico by preventing chronic diseases and improving population health.

Diabetes Prevention Program (DPP)

The U.S. Center for Disease Control's (CDC) Diabetes Prevention Program (DPP) is an evidence-based intervention designed to prevent or delay the onset of type 2 diabetes. It focuses on lifestyle changes such as increasing physical activity, improving diet, and reducing body weight. The original DPP study demonstrated that participants undergoing lifestyle interventions experienced a 58% reduction in the incidence of type 2 diabetes over an average follow-up of 2.8 years compared to the placebo group. The incidence of diabetes was 39 percent lower (95 percent confidence interval, 24 to 51 percent) in the lifestyle-intervention group than in the metformin group[xii].

Ornish Lifestyle Medicine Program

The Ornish Lifestyle Medicine Program is paid for by Medicaid Fee-For-Services and focuses on comprehensive lifestyle changes such as diet, stress management, exercise, and emotional support to reverse chronic diseases, particularly cardiovascular disease. The Lifestyle Heart Trial revealed that participants adhering to the Ornish program maintained a 7.9% improvement, whereas the control group experienced a 27.7% worsening in coronary artery blockage five years after the intervention[xiii].

Blue Zones

Blue Zones initiatives aim to improve community health by promoting healthy living environments. These interventions focus on fostering healthy behaviors through changes in the built environment, community engagement, and policy changes that promote better diets, physical activity, and social interaction. While direct clinical data on disease incidence reductions are limited, communities implementing Blue Zones principles have reported significant health improvements. In Minnesota they found a 40% reduction in healthcare claims among city workers and an 25% increase in property value in the downtown area where the intervention was implememented. In Fort Worth, Texas they found a 6.1-point increase in Fort Worth's Well-Being Index score . A 1-point increase in the WBIS **is expected to produce a 2.2% less** likelihood of hospital admission, **1.7% less** likelihood of ER visit and **1.0% less** likelihood of incurring healthcare costs[xiv].

Community Health Worker (CHW) Interventions

Community Health Workers (CHWs) play a vital role in delivering preventive care, particularly for underserved populations. CHWs help patients navigate healthcare systems, provide education on managing chronic conditions, and connect individuals to community resources that address social determinants of health, such as housing, food security, and transportation. The HGC OVC program described previously leveraged telehealth used by CHWs.

Community Health and Support Services

Community Health and Support Services include a wide range of initiatives, from health education and nutrition programs to mental health services and chronic disease management. By

addressing the root causes of poor health, such as lack of access to nutritious food, non-emergency transportation, or stable housing, these services can reduce the burden on healthcare systems. The American Hospital Association estimates that 80% of a person's health can be attributed to these social determinants of health.

Incorporating these high-value programs into Puerto Rico's healthcare system can effectively reduce the demand for costly acute care services by focusing on prevention and early intervention. By promoting lifestyle changes, improving access to community support services, and addressing the social determinants of health, these interventions will result in better health outcomes and a substantial ROI for Puerto Rico's healthcare system.

Conclusions

Puerto Rico's healthcare workforce challenges are complex and deeply rooted in issues like migration, financial pressures, market inefficiencies, and administrative burdens. To address these challenges effectively, a multifaceted approach is necessary. This should include strengthening workforce planning, improving working conditions, reducing administrative burdens, and investing in prevention and better care coordination. However, due to the interconnected nature of these issues, it is critical that solutions are developed collaboratively with all parties affected—healthcare professionals, government agencies, educational institutions, and private sector stakeholders.

The domino effect described by many in this study underscores how deeply these issues are intertwined. Shortages in the workforce, financial constraints, and operational inefficiencies all feed into one another, exacerbating the problems further. If one piece of the system breaks down, it sets off a chain reaction that worsens conditions across the board. Therefore, attempting to fix one area in isolation is unlikely to result in meaningful or lasting change. Only through open dialogue and partnership with those directly impacted can we ensure that the proposed solutions are both practical and effective. By taking this coordinated approach, Puerto Rico's healthcare system can become more resilient, and healthcare access across the island can improve.

Limitations

Methodological Limitations

A key limitation of this study was the short timeline for data collection and analysis. This constraint may have affected the depth and breadth of data gathered. To mitigate this limitation, the team implemented several strategies:

1. Strategic Grouping of Participants: Interviews and focus groups were strategically scheduled to group participants whenever feasible. This approach facilitated richer and more dynamic discussions within the available time frame, allowing for a more comprehensive understanding of the issues.
2. Iterative Integration of Emerging Topics: As interviews and focus groups progressed, the research team continuously integrated emerging topics into the interview guides. This iterative approach ensured that new and relevant themes were explored in subsequent discussions, enhancing the robustness of the data collected.

Other study imitations include:

Potential for Selection Bias: The use of purposive and snowball sampling may have introduced selection bias, as the participants selected through these methods may not fully represent the diversity of experiences and perspectives within the healthcare workforce. Efforts were made to reach a wide range of participants, but the possibility of bias remains.

Limited Generalizability: Given the qualitative nature of the study, the findings may not be generalizable to all healthcare settings in Puerto Rico or other regions. The study aimed to provide in-depth insights rather than broad generalizations, and the results should be interpreted within the specific context of the sampled participants.

Reliance on Self-Reported Data: The study relied on self-reported data from participants, which may be subject to recall and other bias. Participants may have provided responses that they perceived as favorable or that aligned with what they believed the researchers wanted to hear. To address this, the interview guides were designed to encourage honest and reflective responses.

Despite these limitations, the study was designed to provide valuable insights into the current state and future needs of the healthcare workforce in Puerto Rico. Future research with extended timelines and broader sampling methods could further validate and expand upon the findings of this study.

Appendices

Appendix A
Interview Guides

Appendix B
Summary of observations/takeaways

Appendix C - Detailed description of themes

Domain 1: Gaps between supply-demand of health services

While all interviewees agree that there is a severe problem with access to health services on the Island, characterized by significant patient wait times, the factors identified as limiting this access extend far beyond a problem of physician shortages. Informants identified a web of interrelated factors with varied implications depending on the system stakeholder, making the gap between workforce supply and demand more complex.

Theme 1.1 – Severity of the healthcare access problem

There is a consensus across stakeholder groups regarding the severity of the healthcare access problem in Puerto Rico. Interviewees described that the severity is manifested through long patient wait times when in need to see a healthcare provider resulting in a direct negative impact on the health of the population.

The issue of long wait times for medical appointments was highlighted in all interviews. Interviewees reported that wait times for appointments range from three months to a year, with some stakeholders noting that certain physicians in specialized fields have stopped accepting new patients altogether. The severity of this issue was so pronounced that a group of interviewees coined the term “contact medicine” to describe it.

When asked about the meaning of the term “contact medicine,” interviewees explained that "contact medicine" means that you need a direct contact with someone who knows a doctor with the needed subspecialty to secure an appointment. They characterized this situation as a “tragedy” for the general population. A critical question raised by several informants was: What happens to patients who do not have a “contact” within the healthcare system?

Here are some quotes from providers regarding wait times that describe the situation:

> *“If you were to call our clinics today to request an appointment, you would face months of waiting.”*

> *“We have so few specialists… that the appointment will be in a year, by which time the condition has become chronic.”*

> *“The problem with subspecialized care is that, since there are so few specialists, once a patient is seen by a subspecialist, that patient continues to see the subspecialist [routinely]. Therefore, appointment slots are filled by patients with chronic conditions. Many [new] patients want to access appointments with these subspecialists, and appointments are scheduled for a year or nine months out. This explains why the few*

subspecialists available are so overwhelmed, as they primarily see chronic patients, which represents a challenge for access and availability."

Issues related to access to health care services were cited by informants across the board for the entire population in all geographic areas, across all ages, all socio-economic levels, and all health insurance coverage. Additionally, informants expressed heightened concerns for access to healthcare in rural and non-metropolitan geographic areas. This quote shared by one informant sums up general consensus around this issue:

> "...the distribution of patients is spread across the entire island, while the distribution of healthcare professionals is concentrated in the metropolitan area. Specialists prefer to live in the metro area for personal reasons (schools, housing, entertainment, services, etc.). This has created a critical access situation across the island in places outside the northern corridor..."

Puerto Rico's healthcare system faces significant challenges due to the aging medical workforce. A large portion of physicians are over 60 years old, with many continuing to work into their 80s. This aging workforce struggles with adopting new technologies essential for modern healthcare and is burdened by increasing administrative demands required by government programs. One interviewee highlighted, "We have doctors here who are over 80 years old and still working, but they struggle to keep up with the demands of modern medical practice, especially when it comes to technology."

Additionally, informants cited that the impending retirement of over half of the current medical workforce within the next 10 to 15 years threatens to exacerbate existing healthcare shortages. These retirements could lead to longer wait times, reduced access to care, and a decline in the overall quality of healthcare services. Addressing these challenges requires urgent planning and support to ensure that the healthcare system remains resilient and capable of meeting the needs of Puerto Rico's population.

Theme 1.2 – Increased population illness

Puerto Rico has the highest incidence of diabetes, hypertension, and asthma in the United States.[1] Informants cited the significant impact of lack of access to healthcare on patients' health and mortality. The following quotes illustrate informants' views about how delayed care impacts health outcomes among island residents:

"And in that in-between, there is a large sector of the population that remains unprotected. When they arrive at hospitals, we try to work miracles with a patient who arrives in very bad condition. If they had access to primary care earlier, it could have been resolved quickly."

"People suffer from a lack of early diagnoses. If I have to wait three months, imagine the diagnosis—it won't be timely, and there won't be timely treatment either. Chronic conditions increase because we can't get to specialists either too early or too late."

"Similarly, for pediatric conditions, [as]children grow rapidly, monitoring and follow-up during these ages are crucial, and the absence of a provider during this time can affect their development and primary and preventive health."

"This also applies to emotional or behavioral conditions that are not identified promptly, which also has an impact."

"I would also add that in terms of the quality of services, it increasingly affects how difficult it is to view the patient comprehensively and holistically—from primary clinical, social, and mental aspects—when the demand for services is so high and healthcare professionals do not necessarily have the time. This makes it increasingly challenging to address all these aspects in a single medical encounter."

"Morbidity is directly affected especially in patients with chronic conditions. Delays in obtaining appointments, cancellation of follow-up appointments, continuity of care are devastating and can lead to an increase in morbidity."

Informants added that this situation was heightened by a multitude of socioeconomic factors impacting patients on the island, including social determinants of health that are not being fully addressed within and outside the health care system. Informants also mentioned the impact of the hurricanes, earthquakes and the COVID-19 pandemic on the fragility of patients.

Theme 1.3 – Access is a systemwide problem

While wait times were generally related to access to an appointment with a physician, informants noted that the factors that influence lack of appointments go beyond the need for more physicians thus signaling to a systemwide problem. The physicians interviewed emphasized the need to build strong clinical teams, use state-of-the-art technology and increase hospital resources to provide high-quality care to their patients. They were emphatic on the urgent need to recruit skilled nursing staff and allied health professionals.

The following quote by a physician clearly illustrates these challenges:

"We have the problem with our nurses who are our right hands; they are the ones who execute our orders. They are demoralized, poorly paid, equally under work pressures, doing double shifts with little income, handling many patients per shift, and so on. They are in the day-to-day operations of the hospital. This staff is becoming scarce in Puerto Rico hospitals, which means hospitals can't function… The hospital is where procedures are performed that the doctor cannot do in the office. The concept of the hospital is the extension of the doctor's practice, and if there is no staff, no technology, no large machines or instruments, then the doctor cannot perform these procedures, which also reduces their medical practice income or motivation. It's like a domino effect. We also need technicians, like electrocardiography technicians for hospital procedures and respiratory technicians for managing respirators. If these technicians are not available in Puerto Rico, are not well paid, or are mistreated like the nurses, they leave. Nurses have

an escape route with incentives from the United States offering great alternatives and advantages, so they leave, abandoning Puerto Rico. I find myself in some hospitals without anyone to perform studies or procedures."

Another quote explains it from the patient's perspective: *"A patient's path depends on their coverage. In low-cost commercial plans, networks are limited, and many are restricted in what they can access and how long it takes to get an appointment. In commercial plans… the rates haven't been reviewed for many years, and this is affecting service availability. For Vital patients, access is through clinics, and some clinics don't have mental health professionals available, or they are clinics that patients don't want to go to—resulting in a negative and low-quality experience. Medicare Advantage has an open network, and patients have a better experience and more access."*

Theme 1.4 – Challenges with Recruitment of Health Professionals

Informants from academic institutions, hospitals, outpatient clinics and primary care groups mentioned that there is an immediate need to recruit physicians, nurses, and allied health professionals because a large segment of the health care workforce, especially physicians, in the island has reached retirement age. However, recruitment of needed workforce presents many challenges. Some of the challenges include training gaps among prospective hires, working condition expectations from applicants, competing offers from institutions in the United States, government regulations, and credentialling processes, among others.

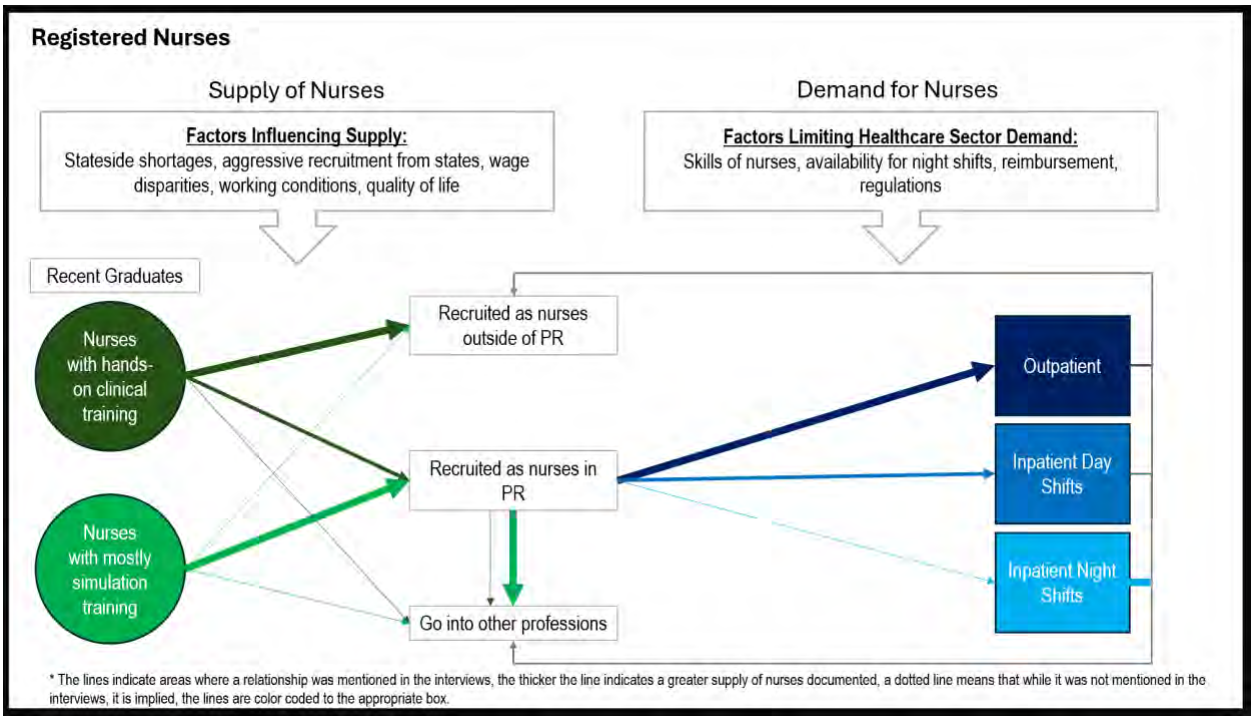
The process of hiring registered nurses, as described by informants, illustrate many of the recruitment challenges presented above. When prompted to describe skill-related challenges when hiring nurses, informants noted that in recent years there has been a proliferation of non-accredited nursing programs on the island that rely almost exclusively on the use of simulation labs for training purposes. Although they explained that simulation-only training was developed in order to increase the amount of nurses that programs could graduate in response to the lack of real-world opportunities for nursing students in healthcare facilities, informants cited that many of the nurses graduating from these programs lack needed skills to meet the needs of real-life patients. Therefore, a remedial measure intended to increase the supply of nurses, has not alleviated those shortages as, health care providers cited they are reluctant to hire nurses graduating from these schools. When nurses are hired, keeping them on the job also becomes challenging, according to study informants. They agreed that many registered nurses quit their jobs because they find that the high-stress work environment is not worth the remuneration they receive, which is comparable to that of other jobs such as estheticians, nail technicians and other beauty specialist. Furthermore, external factors such as nursing shortages in mainland US, where nurse wages are two- to three-times higher, makes it easy for recruiters from mainland US healthcare facilities to lure experienced nurses from accredited programs to take jobs elsewhere. Informants indicated that local healthcare providers cannot match these job offers because the pay that nurses receive generally does not take into account the nurse's skill level. This results in a significant workforce retention challenge.

Hiring health care professionals to work night shifts was mentioned as a significant challenge during the group discussions. Informants representing hospital facilities shared their experiences managing shortage of staff for emergency room night shifts. This is what they said:

> *"The younger clinical staff don't want to work night shifts."*
>
> *"We particularly have much more ease recruiting for daytime facilities than for emergency room night shifts."*
>
> *"There are emergency physicians who don't want to rotate, even though they specialize in emergency medicine."*

Challenges to recruitment are complex, nuanced and specific to the profession and the workplace setting.

The figure below provides a streamlined framework to illustrate factors that influence the process of hiring registered in light of existing supply and demand forces.



A similar exercise to this can be done for each health profession.

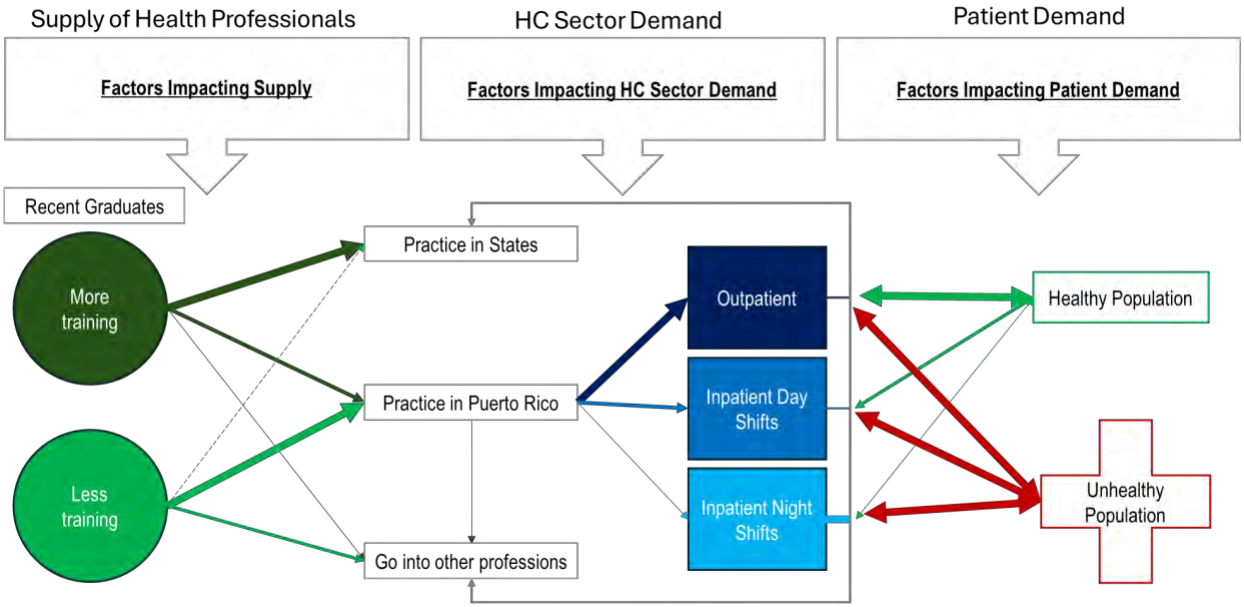
Theme 1.5 – Complex interplay of interrelated factors impact supply and demand

Interviewees discussed that the complexity of the healthcare access problem is driven by multi-prong and interrelated factors. The interviews provided examples of mismatches between training and practical capacity, skills and compensation for comparable jobs, reimbursement and effort of providers and health service offering and patient needs among others. One thing they

also highlighted was a framing of the supply and demand formula for health care services that allowed for the complexities to be incorporated.

The following figure presents a summary of how supply and demand workforce factors seem to shape health care workforce recruitment in Puerto Rico, based on the experiences informants shared. In one side you have the supply of recent graduates while the demand is not really a product of the healthcare sector employer demand, but rather a function of patient needs. Additionally, there are multiple factors that impact the supply of skilled healthcare workers, the employer demand and the patient demand.

Health Professional Supply & Demand



* The lines indicate areas where a relationship was mentioned in the interviews, the thicker the line indicates a greater relationship was noted in the interviews, a dotted line means that while it was not mentioned in the interviews, it is implied, the lines are color coded to the appropriate box.

The framework highlights the importance of investments in improving the health of the population. As can be seen in the table above an unhealthy population adds demand for health services to an already overwhelmed system. One interviewee's quote sums it up.

> "The government needs to have a clear policy on health prevention and promotion. We continue to think that prevention and health promotion are expensive, but in the long term, they are the most cost-effective public health strategies. As long as we are focused solely on managing episodes of illness, it will become increasingly difficult to contain costs, and the healthcare sector will require more and more human resources and financial support."

The next section will of this report detail the factors influencing this model.

Domain 2: Factors driving the gaps

Factors impacting supply of trained health professionals

Theme 2.1 – Access to training and clinical experience

Limited Pathways and Role Models for Health Professions in High Schools

Collected narratives indicate that creating a pipeline of students interested in health care professions is a major barrier due to the lack of structured pathways and role models available to high school students. This limitation restricts early exposure to health careers, which is crucial for inspiring students to pursue professions in this field. As highlighted by a participant, "*There aren't enough initiatives in high schools that guide students towards health careers. Without exposure to these fields and mentors who can guide them, many students don't even consider these options.*" This absence of early engagement contributes to the low number of students entering health professions programs at the post-secondary level, thereby weakening the pipeline of future health care professionals.

Challenges in Expanding Medical School Enrollment, Residencies, and Fellowships

Expanding medical school enrollment, residency programs, and fellowships in Puerto Rico faces significant hurdles due to stringent accreditation requirements, financial constraints, and structural limitations within the healthcare education system.

Accreditation Requirements and Financial Constraints

Although the rigorous standards set by bodies like the Accreditation Council for Graduate Medical Education (ACGME) are essential for maintaining quality they are difficult to meet, especially for institutions with limited resources. One interviewee emphasized, "*Developing residency programs that meet ACGME accreditation standards is not only complex but also extremely costly. Without adequate [up front and recurrent] funding, it's nearly impossible to maintain these programs at the required level*." This situation is different in Puerto Rico (vs. the States) because there is a lack of Medicare funding for teaching hospitals and this makes it difficult for hospitals to justify the costs of expanding programs.

While medical residency programs are undoubtedly costly, the historical accreditation challenges in Puerto Rico have been more closely linked to difficulties in offering competitive compensation for attending physicians and faculty, which is essential for ensuring proper supervision and support for residents, as well as securing the necessary technology for specialized programs like neurosurgery. Despite these challenges, the majority of our medical residency programs have successfully maintained accreditation—a demanding task that, when well-managed, can be cost-effective. Residency programs should be viewed as a strategic investment, with substantial evidence demonstrating their role in enhancing patient care quality and as a critical risk management component.

Residency Program Closures

Financial challenges have led to the closure of residency programs, further reducing the number of available training positions and further exacerbating healthcare workforce shortages. "*We had to close a residency program because the hospital couldn't sustain the financial burden*," shared one participant, highlighting a cycle where fewer residency positions lead to fewer trained physicians, worsening the overall shortage.

Geographic Isolation and Infrastructure Issues

Puerto Rico's geographic isolation and outdated healthcare infrastructure also hinder the development and expansion of medical education programs. The island's hospitals often lack needed state-of-the-art facilities and technology to train residents in the most recent innovations, limiting opportunities for growth. "*Our hospitals are not equipped with the latest technology, which is crucial for training residents. This is a major barrier to expanding our programs*," noted a respondent.

Faculty Recruitment Challenges

Attracting and retaining qualified faculty is another major contribution to workforce shortages. Puerto Rico's financial constraints make it impossible to offer competitive salaries to faculty. This results in an exodus of well-trained health care professionals who opt to move to the United States or work in other industries. In this regard, one interviewee stated, "*We can't offer competitive salaries to our faculty, and this makes it incredibly difficult to attract and keep the talent we need. Many prefer to work in the mainland U.S., where they can earn significantly more.*"

Impact on Medical School Enrollment

Interviewees noted that for various years, the island has experienced a "brain drain." Many medical students leave the island for residency training in the United States and do not return, further diminishing Puerto Rico's healthcare workforce. "*Our graduates often match with residency programs in the U.S. mainland, and many never come back. This leaves us with a growing gap in our healthcare workforce*," lamented one interviewee. Addressing these issues requires a comprehensive approach, including securing better funding, improving infrastructure, and developing policies that make faculty recruitment and program expansion more feasible.

Proliferation of Nursing Programs with Limited Clinical Practice Opportunities

The rapid expansion of nursing programs in Puerto Rico has been accompanied by significant challenges, particularly concerning the availability of adequate clinical practice opportunities. This shortage of clinical sites has led to concerns about the quality of nursing education and the readiness of graduates to enter the workforce. One participant emphasized, "*There's a real concern that many nursing programs are producing graduates who need substantial additional training before they can effectively serve in healthcare settings. The shortage of clinical sites is a major bottleneck in ensuring nurses are well-prepared*." This situation necessitates further

investment in clinical training infrastructure to enhance the skills nursing graduates and reduce the burden on healthcare providers who must allocate resources to additional training on the job.

Financial Burden of Medical Education and Insufficient Incentives for Students

The financial burden associated with medical education is a major deterrent for students considering health professions, especially in primary care. The significant debt incurred by medical students, combined with relatively low compensation in primary care specialties which are remunerated at a similar rate to general practitioners (who complete a 1 year internship vs. 3 years of residency training), makes these careers less attractive. One interviewee explained, "*Students are graduating with immense debt, and the financial rewards in primary care simply don't match the effort and investment required. Without stronger incentives, it's hard to justify pursuing these specialties*."

Insufficient Skills Among Newly Graduated Generalists for Primary Care

A recurrent concern among interview participants was that newly graduated physiciam generalists often lack the needed skills to work effectively in primary care settings. This skill set gap was largely attributed to the limitations in clinical training throughout their education. A clinician leader remarked, "*New graduates, especially those who haven't undergone rigorous residency training, often aren't equipped to handle the demands of primary care. This not only impacts the quality of care but also places additional strain on the healthcare system, which has to compensate for these deficiencies*." Addressing these educational gaps is essential for ensuring that health professionals entering the workforce are fully prepared to meet the needs of the population, particularly in primary care settings.

These identified barriers underscore the complexity involved in developing and sustaining high-quality health professions education in Puerto Rico. Addressing these issues will require targeted interventions at multiple levels, including improving early exposure to health careers, expanding and supporting residency programs, enhancing clinical training opportunities, and providing financial incentives to attract and retain students in critical healthcare fields.

Theme 2.2 – Lower recruitment incentives

Participants described how the lower remuneration and incentives that healthcare professionals in Puerto Rico receive contribute to a significant drainage of talent to the United States after graduation. This reality underscores the disparity in salaries between Puerto Rican and U.S. healthcare professionals, and the active recruitment efforts by U.S. health organizations that further pull them out of the island.

MDs in Puerto Rico Have Lower Remuneration Than in the U.S.

During the interviews, participants repeatedly emphasized that physicians in Puerto Rico earn significantly less than their counterparts in the U.S. This wage gap is a critical factor driving the

migration of doctors from Puerto Rico to the mainland United States. As one participant highlighted: "*It's disheartening to see that after years of education and training, our doctors are paid a fraction of what they would earn in the U.S. This wage disparity is pushing our best talent away*."

Nurses and Allied Health Professionals Face Lower Salaries

The issue of low salaries is not limited to physicians. Nurses and allied health professionals in Puerto Rico also face substantial pay gaps when compared to similar professions both locally and in the U.S. Participants noted that nurses and allied health professionals are paid salaries that are similar to those that they would earn working at a beauty salon or in retail, which they considered less "stressful" jobs. Participants shared numerous accounts of how this financial inequity affects career decisions and quality of life:

> *"Nurses here are expected to do so much, often more than in the U.S., yet we are paid so little. It's not sustainable, and many are choosing to leave."*
>
> *"Allied health professionals are critical to our healthcare system, but the pay does not reflect the responsibilities we carry. This imbalance is forcing many of us to look for opportunities elsewhere."*

U.S. Health Organizations' Recruitment Strategies

The wage disparity and challenging working conditions in Puerto Rico are compounded by the aggressive recruitment strategies employed by U.S. health organizations. These organizations actively seek out trained health care professionals, offering them enticing packages that include streamlined licensing, debt repayment, and relocation assistance. This is how one participant described recruitment strategies by U.S. organizations: "*They make it so easy to leave. They offer to pay off your student loans, help with relocation, and even simplify the licensing process. It's an offer that's hard to refuse, especially when you're struggling to make ends meet here*." This recruitment not only drains Puerto Rico of its healthcare talent but also creates a vicious cycle where the lack of professionals further strains the local healthcare system, making it even more difficult to retain the remaining workforce.

In summary, lower recruitment incentives in Puerto Rico, exacerbated by the wage disparities and aggressive U.S. recruitment strategies, are key factors contributing to the migration of healthcare professionals from the island. The ongoing loss of talent threatens the sustainability of Puerto Rico's healthcare system, highlighting the urgent need for reforms that address these disparities and provide competitive incentives for local health care professionals.

Theme 2.3 – Barriers to licensing and credentialling

Bureaucratic Licensing Process

Interviewees described the licensing process as overly bureaucratic, with multiple layers of documentation required in person and on paper, often with unclear guidance on how to properly

complete documentation. This has led to long wait times for professionals (including physicians, nurses and allied health professionals) trying to obtain or renew their licenses, with some waiting months or even years before being fully credentialed. As noted in the collected narratives, even after paperwork submission, there are frequent rejections due to minor errors, which further delay the process. This inefficient bureaucratic system discourages recent graduates and professionals coming from other States from practicing in Puerto Rico, as they find it easier to obtain licenses in other U.S. jurisdictions with more streamlined processes. The following quote summarizes the experience with the licensing boards: "*Whenever there are changes in the board, when a new member arrives with new ideas, we have to resubmit all the evidence showing that we comply with all the competencies. And meanwhile, students or program graduates are left unable to revalidate their licenses for one or two years. And they start paying off student loans because they can't revalidate until everything is approved again*."

Inoperant Licensing Boards

Particiants expressed significant frustration with the inoperant state of several licensing boards in Puerto Rico. For example, interviewees highlighted the challenges related to some allied health professionals boards which do not meet regularly, and therefore have not granted licenses in the past year. Hospital stakeholders echoed similar concerns, particularly noting that the inefficiency of these boards contributes to a bottleneck in the healthcare system. An interviewee provided this example to illustrate the current situation with licensing boards: "*The situation with the Radiological Technologists Board and not having the license is what continues to increase the shortage of this professional in the market, but at the same time, it impacts the interest of students in these programs because there is uncertainty about whether they will be able to practice the profession when they graduate*."

Slow Payer Credentialing of Providers

Participants mentioned the significant delays in the credentialing process with payers (including Medicaid, Medicare and Commercial Health Insurers), which is critical for healthcare professionals to start practicing and receive reimbursements for services. This topic emerged in multiple interviews, and highlighted lengthy periods of time to get credentialed, leading to financial strain and frustration. The following statement illustrates participants' sentiment regarding the credentialling process: "*The issue with medical credentialing is that it can take three months or more for health plans to credential a doctor*."

Respondents also noted that the credentialling problem was further compounded by inconsistencies in the implementation of the Medicaid uniform number system, which was intended to streamline credentialing but has instead added more complexity. As one participant noted, "*The system that was supposed to simplify things has instead become another obstacle, causing more professionals to leave the island*."

In summary, the combination of inoperant boards, a bureaucratic licensing process requiring in-person, paper submissions, and slow insurance credentialing creates a significant barrier to retaining healthcare professionals in Puerto Rico. Moreover, the inefficiencies within these systems contribute to the ongoing shortage of healthcare workers and negatively impact patient care.

Theme 2.4 – Need for on-the-job training for new graduates

Throughout the interviews, a recurring theme was the significant gap in practical training for newly graduated healthcare professionals for those entering the workforce in Puerto Rico. Participants emphasized that recent graduates, while well-versed in theoretical knowledge, often lack the practical skills and contextual understanding necessary to succeed in the local healthcare environment. This was discussed at length among participating healthcare providers. They noted that young specialists coming from prestigious institutions outside Puerto Rico are frequently unprepared for the realities of working in Puerto Rico. As one participant described, "*They arrive with expertise from top hospitals, but no one sat with them to explain how to apply that knowledge in the real world here.*"

Another example cited was that in primary care settings, recently graduated doctors are expected to navigate complex cases without the mentorship or training that was once more common. One experienced physician commented, "*In the past, specialists would sit down with us and explain cases, but now young doctors are thrown into the deep end without that support*."

The generational gap between older, experienced healthcare providers and newly trained professionals was another key issue raised in the interviews. Older doctors, many of whom are nearing retirement, were described as having a deep understanding of the local healthcare system and the socioeconomic factors affecting patient care. In contrast, younger doctors were described as lacking critical context knowledge, particularly when treating patients from rural or underserved areas. A participant noted, "*These young doctors trained in metropolitan areas and don't understand the work or context of primary care doctors, especially in rural or disadvantaged areas*." This gap underscores the need for structured workplace learning programs that can bridge the intergenerational knowledge and experience gap. Mentorship programs, continuing education, and hands-on training within the workplace were suggested as key strategies to ensure that new doctors can provide high-quality care in Puerto Rico's unique healthcare landscape.

Another significant concern among interviewees was the need for newly graduates to understand the specific models of healthcare delivery in Puerto Rico, particularly the nuances of managed care systems, coding, and documentation requirements. One interviewee shared an experience where they had to provide extensive training to new oncologists who were unfamiliar with the local healthcare system, stating, "*I had to spend hours explaining everything from referrals to the structure of our healthcare system, because they had no idea how it worked here*." These observations made by interviewees highlight the need for specific workplace training to equip new providers with the skills to navigate the administrative and systemic aspects of healthcare in Puerto Rico. Participants also suggested that medical schools and residency programs incorporate more comprehensive training on these topics to better prepare graduates for the challenges they will face in practice.

Factors impacting retention of health professionals

Theme 2.5 – Low and unstable reimbursement

Interviewees associated the workforce shortage problems with reimbursement policy disparities between Puerto Rico and State Medicaid and Medicare which results in significant wage disparities. The wage disparities make it easier for health care organizations from continental US to actively recruit locally trained health professionals.

The financial challenges arising from low and unstable reimbursement rates were consistently identified as existing in all payment systems, namely Medicaid, Medicare, and private insurance. The unpredictable nature of payment policies was cited as creating significant obstacles for healthcare providers in Puerto Rico, affecting their ability to plan and sustain operations effectively. Provider stakeholders talked at length about the stark disparity in reimbursement rates between Puerto Rico and the mainland United States. They explain that despite facing similar, if not higher, costs for providing care, healthcare providers in Puerto Rico receive significantly lower payments from both government and private insurance plans. This financial shortfall forces local health providers to lower the salaries of health professionals, exacerbating the challenges in attracting and retaining qualified staff.

In sum, there is resounding consensus that the root cause of the workforce shortage issues in PR stems from the significant disparities between Puerto Rico's Medicaid and Medicare reimbursement policies compared to those in the mainland United States. These disparities have led to severe wage gaps, making it difficult for Puerto Rican healthcare institutions to compete with Stateside organizations. As a result, healthcare professionals trained on the Island are often recruited by mainland facilities to help address national workforce shortages.

Unpredictable Payment Policies

Healthcare administrators and providers expressed frustration with frequent and unexpected changes in payment policies by payers because they disrupt financial planning and increase operational risks for healthcare providers. " *One day we think we understand the payment process, and the next day it's different. The lack of consistency is frustrating and adds unnecessary stress to an already difficult job*," noted one participant, The inability to predict revenue streams makes it difficult for healthcare providers to maintain their financial health and continue providing quality care. Other participants noted:

> *"We often find ourselves blindsided by sudden changes in payment policies from insurance companies. One day we're billing under one set of rules, and the next day, without any notice, those rules have changed, and our claims are denied."*
>
> *"It's incredibly challenging to plan financially when the payment policies seem to shift without warning. We can't even predict what we'll be reimbursed for services rendered, making it nearly impossible to manage our budget effectively."*
>
> *"The inconsistency in payment policies not only affects our revenue but also disrupts the entire operational flow. We spend an inordinate amount of time trying to adjust to new billing requirements that seem to appear out of nowhere."*

"The unpredictability of payment policies is one of the most frustrating aspects of dealing with insurance companies. We can't build a stable financial plan when we're constantly dealing with changes in how and when we get paid."

Providers are Diversifying Income Sources

Due to the insufficient and unstable reimbursement, many physicians and other health care professionals have been compelled to seek additional income revenues. This trend further destabilizes the healthcare system, as it pulls valuable provider time and resources away from patient care. For example, psychiatrists, who are already in short supply, are increasingly unable to rely solely on their practice income due to delayed and reduced payments. This situation puts additional strain on the already limited mental health services available in Puerto Rico. In this regard, provider stakeholders shared the following:

"*Given the instability in reimbursements, many of us have had to look for alternative sources of income. It's no longer enough to rely solely on clinical practice; we have to think creatively to sustain our livelihoods."*

"A lot of physicians are now working in multiple settings—clinics, private practice, even teaching or consulting—just to make ends meet. The traditional model of relying on patient care for income isn't sufficient anymore."

"With the way things are going, we've been forced to explore non-clinical opportunities—anything from telemedicine to health-related startups—just to ensure we have a steady stream of income."

These quotes reflect a growing trend among healthcare providers and professionals to diversify their income sources in response to financial instability commonly driven by unpredictable reimbursement policies.

Delays in Claims Payment

Participants reported that some insurers delay payments or deny claims on questionable grounds, adding another layer of financial instability. As one participant noted, "*Insurance companies frequently change their payment criteria, often without communicating these changes to providers. This results in a backlog of denied claims that we have to resubmit, sometimes multiple times, just to get paid for services we've already provided*." These payment delays are not only a significant barrier to maintaining current levels of care but are also a threat to the sustainability of healthcare services in Puerto Rico. The continuous underfunding and financial instability undermine the ability of healthcare institutions to function effectively and retain their workforce, further deepening the healthcare crisis on the island.

Theme 2.6 – Uncompensated administrative burden

Provider stakeholders cited significant challenges due to the uncompensated administrative burden imposed by regulators and health insurance companies that get in the way of patient care. This burden is manifested in several ways: documentation requirements, challenges related to electronic health records, and insurance company surveillance.

Extensive Documentation Requirements

Healthcare providers are required to comply with extensive documentation demands from health insurance companies and regulators. Each insurance provider has its own set of requirements, necessitating healthcare professionals to invest considerable time and resources into fulfilling these obligations. Interviewees described various scenarios:

> "*Each medical plan has its own portal. And you have to be uploading everything to this company's portal, which has a complex system, and I don't want to describe it too negatively, but you have to do a lot of data entry, and it's a constant task. Every time there are more data entries, you have to dedicate resources to maintaining that application*."
>
> "*The insurance companies require so much documentation that it feels like we're spending more time on paperwork than with our patients. It's not just about patient care anymore; it's about meeting all these administrative demands."*
>
> *"The amount of paperwork required by the insurance companies is overwhelming. It takes time away from our patients, and it feels like we're just ticking boxes instead of practicing medicine*."

Electronic Health Records (EHR) Challenges

Healthcare providers in Puerto Rico are facing several challenges when it comes to adopting electronic health records (EHRs). One of the most significant obstacles is the cost, which can be prohibitive for smaller practices and independent providers. Implementing EHR systems requires a substantial financial investment, not just in the technology itself but also in training and ongoing maintenance. This has led many smaller providers to stick with paper records, creating a gap between them and larger healthcare organizations that have the resources to make the switch. As a result, the pace of EHR adoption across the island remains uneven, with financial strain being a major factor.

In addition to cost, there is a noticeable resistance to change, particularly among older physicians. These doctors, who have spent most of their careers working with paper records, often find the shift to digital systems daunting. For many, the process of learning new technology and incorporating it into their daily routines feels like a burden, especially when it comes at the expense of time with patients. Some express frustration, feeling that EHRs take them away from the personal side of medicine. This reluctance to adopt new systems has slowed progress, leaving a portion of the healthcare workforce hesitant to fully embrace EHRs. Overcoming these cultural and financial barriers will be key to ensuring more widespread use of EHRs in Puerto Rico.

The adoption and use of Electronic Health Records (EHR) was cited by some interviewees as creating a problem, in particular for medical professionals who are not tech-savvy. The requirement make detailed notes in the EHR systems was noted to add to the workload of healthcare providers, many of whom struggle with these technologies. This was noted to consumes valuable time that could be spent on patient care but also creates additional stress.

Insurance Company Insertion in/interference with Clinical Practice

Another critical issue raised by various physicians is the perceived incursion of insurance companies into clinical practice. Provider stakeholders indicated that this meddling often leads to ethical dilemmas or conflict of interest, as the administrative demands of insurance providers may conflict with patient care priorities. As expressed by one participant, "*There are many ethical situations where there needs to be a balance between administrative demands and patient needs, which can lead to ethical dilemmas per se and increase the stress associated with the responsibility faced by the professional*." The moral distress was noted by one physician as the principal cause of burnout in their profession.

Overall, the uncompensated administrative burden imposed by health insurance companies in Puerto Rico is a significant factor contributing to the stress, financial strain, and ethical dilemmas faced by healthcare professionals. This burden not only impacts the operational efficiency of healthcare practices but also affects the quality of care that can be provided to patients.

Theme 2.7 – Working conditions and burn-out

After experiencing the 2017 hurricanes, the 2019 earthquakes, the COVID-19 pandemic, and the ongoing challenges in healthcare, all stakeholders agree that the healthcare workforce in Puerto Rico is experiencing severe burnout. In addition to the heavy workloads caused by low full-time equivalent (FTE) counts at many sites, the working conditions themselves contribute to ongoing chronic burnout.

The situation is further exacerbated by the critical need of multidisciplinary health care professionals, such as nurses, technicians, and support staff, for quality patient care. One group emphasized the need for skilled team members to ensure quality care: "*…nurses and technicians are essential for patient care, but the current conditions make it incredibly difficult for them to perform their duties effectively*." This quote illustrates concerns around the skills that these health care professionals bring to the job.

Additionally, interviewees noted that nurses in Puerto Rico are facing unprecedented challenges due to the reduction in staffing and the shifting of responsibilities traditionally handled by other healthcare workers. A notable example cited is the discontinuation of the recruitment of "Enfermeras Practicantes," who were primarily responsible for bathing patients. As one nurse stated, "*Hospitals stopped recruiting Enfermeras Practicantes, and now it's required of us to carry out these roles, even when we have other more demanding responsibilities*." One other interviewee made reference to a demoralizing workplace culture impacting nurses and other support staff, "*There is obviously a lack of recognition and professional valuation*."

Maintaining a balance between wellness and job satisfaction has become increasingly challenging for healthcare workers in these environments. As another interviewee mentioned,

"Maintaining a balance between wellness and job satisfaction for nursing professionals is crucial, but it's nearly impossible under these circumstances."

These quotes reflect a deeply concerning situation where the combined pressures of increased workloads, shifting responsibilities, and inadequate support systems are pushing the healthcare workforce to its limits.

Factors impacting employer demand

Theme 2.8 – Fragmented Patient Care

Interviewees pointed out substantial challenges in ensuring continuity and coordination of patient care. Factors contributing to these challenges include inefficiencies such as reliance on hardcopy, paper documentation and medical records to fulfill referrals, receive lab results, etc. These inefficiencies rely on patients to seek and bring their own paper medical records between providers, lab facilities, and consultations with specialists. One provider noted, "*Currently, interoperability does not exist; documentation is still physical, and when it arrives, it is fragmented. If we could communicate effectively between hospitals, even among ourselves, many of these problems could be alleviated*."

Interviewees emphasized that lack of trust between specialists/subspecialists and general practitioners (GPs) adds another dimension to an already complex problem. Some noted that specialists/subspecialists are hesitant to send patients back to GPs, citing the GPs' limited training, which typically includes a one-year internship, as insufficient for managing complex conditions. Other interviewees described that when a specialist does not communicate with the referring GP, that creates problems for patients with multiple chronic conditions who are forced to navigate their care among various specialists on their own. One interviewee voiced this concern, stating, "*We must demand that our specialist friends document and write properly [when completing patient assessment]. Whether through interoperability or other means, there needs to be a change in policy so that they comply with certain documentation regulations towards us [GPs], as they currently don't document anything properly*."

Due to long wait times for specialist/subspecialist appointments and the lack of available consultations, a particularly concerning practice has emerged in response to these challenges. It was noted that some physicians have resorted to using a WhatsApp group to provide one another with consults without sharing patient's personal identifiable information. One participant described this situation: "*That chat was created by a physician... He grouped together doctors he knew from the [our] area. He uses it precisely so that we can consult through this chat [without sharing protected health information]. He even sends a lot of information about new management protocols." However, another interviewee acknowledged the risks associated with this approach, noting that "this is an extreme measure... It's a gesture of desperation. But it has a strong medical-legal component because, as [the interviewer] says, you don't know who is really giving you a recommendation*." The use of such informal networks underscores the desperation felt by healthcare providers in Puerto Rico, who are striving to mitigate the impact of the fragmented system on their patients. However, as one interviewee pointed out, this is not a sustainable solution: "*We're simply trying to... mitigate the problem a little. But the problem is, as you said, multifactorial, and it's up to many people and agencies to try to solve it*."

Interviewees highlighted how nurse practitioners (NPs) and physician assistants (PAs) could potentially help improving healthcare delivery in Puerto Rico due to their advanced training could help address the shortage of physicians and enhance access to care. However, they also identified several challenges to integrating NPs into the system, such as restrictive regulations, lack of supply, and resistance from some sectors within the medical community to make room for them.

Interviewees also challenged the potential value of adding another layer of care that is not specialized, pointing out that in Puerto Rico, general practitioners (GPs) operate with more privileges than NPs and physician assistants (PAs) have in the States. They indicate that adding NPs and PAs will not improve coordination with specialists because the problem lies in the lack of coordination, not in the lack of GPs.

Interviewees also highlighted the issue of service redundancy among hospitals, where competition leads to inefficiencies and diluted care quality. They emphasized that hospitals should stop competing and instead specialize in different areas of care, which would allow for the creation of centers of excellence that provide high-quality, specialized services.

Theme 2.9 – Barriers to technology and interoperability

Interviewees highlighted several critical barriers to the adoption of technology and interoperability in Puerto Rico's healthcare system. These challenges were cited as significantly hindering the ability to provide efficient, high-quality care across the island.

Limitations and Opportunities for Telehealth

Telehealth is a vital tool for expanding and improving access to healthcare, particularly in rural and underserved areas, according to informants. However, they blamed major regulatory and logistical barriers for hampering full implementation of telehealth in PR.

Stringent regulations in Puerto Rico limit the capacity for doctors to provide telemedicine services, particularly when they are not physically located on the island. This restriction complicates efforts to use telehealth as a strategy to bridge access gaps. For example, in remote areas, where access to specialists is already limited, telehealth could serve as fundamental link between patients and local providers for necessary medical expertise.

A group of stakeholders shared lessons learned from an ongoing hybrid in-person and telehealth pilot project they have implemented in a rural area in PR. This project demonstrated that telehealth, when carefully integrated with traditional care, could significantly improve access to medical services and reduce overall health costs. The success of this pilot underscores the importance of revisiting current regulations to allow for broader use of telehealth, especially in areas with critical shortages of healthcare providers.

One interviewee noted, "*Telehealth should be an integral part of our healthcare strategy, particularly in rural areas where access to in-person care is limited. However, it needs to be supported by appropriate regulations and training to ensure it complements rather than replaces traditional care.*" This perspective was echoed by many of the informants, who see telehealth not as a substitute for in-person visits but as a valuable complementary tool that can increase the reach of healthcare services to those most in need.

Lack of Interoperability

The lack of interoperability between individual healthcare providers and hospitals was consistently identified as a major obstacle to coordinated care. As noted in one interview, "*We are very behind in this process because when we transfer a patient, and we see this daily here, we are very strict with specific requirements, and the hospital has no way to transfer the records. So, they are not scanned; there is no interoperability; we cannot access a report from another institution*." This fragmentation of information creates risks for patients, as their records may be incomplete, misinterpreted, or lost during transfers between facilities.

Another stakeholder emphasized the critical need for governmental action to address these issues: "*The government must mandate the adoption of technology. It is the only way to ensure that services and access are provided appropriately. The connection of information, documentation, and transmission is essential to ensure that the system is not being misused and that patients who truly need the service receive it.*" A mandate for technology adoption was seen by many informants as essential for ensuring that healthcare services are delivered effectively and that resources are not misused.

Risks and Opportunities Related to AI and innovation

The integration of artificial intelligence (AI) and other advanced technologies into healthcare presents both significant opportunities and challenges, according to respondents. As one interviewee mentioned, while students and young professionals are keen on these new technologies, they often feel overwhelmed by the demands of using it. "*For example, the use of artificial intelligence in clinics in the United States and many centers, the use of electronic medical records, various technologies – students are very interested in these, but they are also overwhelmed by how to use them, interpret them, and what to do with all these resources*." This quote suggests that there is a need for curriculum development and faculty training to better prepare healthcare professionals for the future.

Notes drawn from not recorded stakeholder meetings further underscore the need to integrate technology into healthcare and advocate for a systematic approach to ensure that all healthcare providers can effectively use and benefit advanced technology. In this regard, interviewees cited that the successful implementation of technology and interoperability in Puerto Rico's healthcare system requires regulatory reform, financial investment, and a concerted effort to train healthcare providers.

Theme 2.10 – Multigenerational dynamics

The healthcare sector in Puerto Rico is experiencing a work culture shift as younger generations of healthcare professionals enter the workforce. Informants noted that, unlike their predecessors, these new professionals are less willing to work 60+ hours per week that have long been standard in the field. This shift has raised concerns among informants regarding the younger generation’s work ethics and work commitment levels.

Interviewees highlighted that younger professionals tend to prioritize work-life balance over the traditional long hours expected in the medical profession. One informant mentioned, "*The newer generation of doctors is less interested in dealing with the complexities of billing, medical plan affiliations, and the bureaucratic challenges that come with today's healthcare system*." This sentiment reflects a broader reluctance among younger healthcare workers to engage with the administrative burdens that have increasingly become part of the job.

Furthermore, current healthcare system's structure, which often requires doctors to maintain their own independent practices and negotiate fees with hospitals and insurance plans, is increasingly seen as unattractive. As one stakeholder noted, "*Our healthcare system is still one where the doctor has to manage their practice independently, negotiating with hospitals and insurance plans, and younger doctors are less interested in taking on these challenges*."

These intergenerational dynamics present a substantial challenge for the healthcare system in Puerto Rico, where the workload has become heavier due to the shortage of specialists throughout the island.

Theme 2.11 – Protectionist Practices and Regulations

Barriers for Younger Physicians

Interviewees noted significant challenges faced by younger physicians in Puerto Rico, particularly in gaining access to surgery spots in hospitals. One informant emphasized, *"Younger doctors are finding it difficult to secure surgery spots in hospitals, and this is creating a bottleneck in the system. The more experienced physicians often dominate these positions, leaving little room for new talent to grow."*

Regulations Hindering Efficiency

According to participants, the healthcare system in Puerto Rico is also burdened by regulations that, while intended to ensure quality, often result in inefficiencies. An example shared in the interviews highlighted the strict requirement for specific professionals to perform certain tasks: "*We need a respiratory technician just to put an oxygen mask on a patient... These rules slow down our operations and reduce the flexibility needed to provide timely care*."

Technological Barriers and the Loss of Talent

New technologies are both an opportunity and a challenge in Puerto Rico's healthcare landscape. One interviewee explained that a physician who trained in the United States who has learned how to use a specific robot may have a hard time performing procedures if the robot is not available.

Factors impacting patient demand

Theme 2.12 – Unintended Consequences of Well-Meaning Policies

Informants explained that policies intended to improve the healthcare system often have unintended consequences. This is particularly true for healthcare workers like nurses and other

allied health professionals. Interviewees highlighted that well-meaning policies can inadvertently lead to economic and professional challenges. These unintended consequences of policies, while well-intentioned, contribute to the challenges of recruiting and retaining skilled healthcare workers, ultimately affecting the quality and continuity of patient care.

Emergency room misuse

For example, emergency rooms have become overwhelmed by patients that cannot get a timely medical appointment. Emergency rooms are the only place where patients, notwithstanding their insurance status can be seen by a specialists. The result is overcrowded emergency rooms are seeing patients, but are not equipped to manage chronic conditions. Therefore, patients see a physician, but don't necessarily get the treatment they need for the underlying cause of the emergency.

These quotes describe these ER experiences:

> "To get an appointment, we are so saturated that the next available slot might be in six months. Patients with symptoms now end up going to the emergency rooms, which overcrowds the ERs in the hospital system."
>
> "Emergency room patients are among the most affected... ERs have become places for treating chronic conditions that could be managed with a visit to a doctor. But because doctor's appointments are so far out..."

Informants from hospitals indicated that patients arriving at ERs are sicker and that reimbursement for emergency room services is not on par with the services provided:

> "The type of patients coming to our hospitals is more complicated, and the morbidity and mortality rates have been and continue to increase."
>
> "Hospitals, once they submit their claims to health insurance plans, face a continuous struggle to get those services or hospitalizations approved. In the end, when the payment arrives, it never reflects the billed amount agreed upon in the contract."

Referrals delaying diagnosis and care

Another example shared by informants relates to requirements for patient referrals. The original intent of patient referrals was to help primary care providers manage and coordinate patient care across multiple providers. Interviewees highlighted significant inefficiencies in Puerto Rico's referral system, particularly in cases where multiple referrals are required to complete a straightforward preventive procedure.

One striking example of the inefficiencies in Puerto Rico's referral system is the requirement of multiple referrals to complete a simple medical procedure, such as a colonoscopy. Informants noted that, patients might need as many as four referrals to complete the process, which causes

substantial delays in diagnosis and treatment. One healthcare provider described the complications, stating, "These are internal consultations for us, taking up time we could use to see patients. For example, a colonoscopy could be done, and the results sent to me, unless there's a pathology. But this requires three referrals, which complicates things for us."

Interviewees expressed concern that this cumbersome process not only creates unnecessary delays but also adds to the frustration of patients who may already be dealing with significant anxiety about their health. They noted that the time lost in obtaining these multiple referrals can result in delays in diagnosing serious conditions, such as colorectal cancer. As one interviewee pointed out, "Cancers are being diagnosed later and reaching us later, and chemotherapy is so often questioned that treatment starts very late. This delay contributes to cancer mortality through complications."

This example, as reported by interviewees, underscores the critical need to streamline the referral process to ensure timely access to necessary medical procedures and to prevent the worsening of patient outcomes due to administrative delays.

Theme 2.13 – Complexity of patients' living conditions

The living conditions of patients, particularly in medically underserved areas, present significant challenges for healthcare delivery. Interviewees consistently described the impact of social determinants of health on both patient outcomes and the ability to attract healthcare professionals to regions where patients are underserved.

One interviewee noted the stark reality faced by rural communities: "*In these rural areas, we cannot offer these things [support services]. For example, there isn't even a school… But people now want quality of life, and the truth is that in these rural areas, there are social determinants of health that affect recruitment and make it less appealing for people to want to come and work here*."

Informants noted that social determinants, including education, access to transportation, and economic stability, not only affect the quality of life for residents but also complicate healthcare delivery. Healthcare providers must navigate these challenges while also addressing the medical needs of patients, who often have complex, chronic conditions.

Furthermore, stakeholders explained that the existing reimbursement and billing structures do not adequately account for the additional time and resources required to address these social determinants. One interviewee explained, "*In terms of reimbursement or billing codes for health service delivery, there are three important areas: evaluating the domains of Social Determinants of Health, integrating community patient navigation services, and chronic condition patient navigation services.*"

These factors collectively contribute to the complexity of care in rural areas, which call for a more integrated approach that requires addressing both medical and social needs to improve patient outcomes and makes it a challenge to attract healthcare providers to work in rural areas.

Theme 2.14 – Minimal investment in prevention and primary care

Stakeholders spoke at length about the critical need for a clear and robust island-wide policy on prevention and health promotion. As one interviewee put it, "*There needs to be a clear policy of prevention and health promotion. We continue to see that health promotion is costly, that disease prevention is costly because we look at it in the short term, but in the long term, it is the most cost-effective health strategy*." This insight highlights the short-sighted approach that currently prevails, where immediate costs are prioritized over long-term savings and improved health outcomes.

Informants also noted that the healthcare system in Puerto Rico suffers from a significant underinvestment in primary care and prevention, a situation that stakeholders consistently flagged as detrimental to the overall health outcomes on the island. Interviewees noted that while primary care is supposed to be the cornerstone of the healthcare system, it has been largely neglected, both in terms of funding and strategic importance. They explained that primary care is often capitated, meaning that primary care providers are "at risk" and bear the financial burden of ensuring compliance with cost and quality metrics. The rules of compliance in cost and quality metrics vary by health insurer, and program, creating significant administrative burden, which is scarcely compensated. Additionally, the payment rules and regulations change without warning, and some providers indicated that they were unable to project their revenues due to the complexity. Stakeholders emphasized the low levels of health education among patients combined with a health care delivery system that is ill equipped to provide integrated care, result in poor population health outcomes. They mentioned that patients often lack the necessary knowledge to manage their health effectively, which leads to a higher reliance on emergency services and specialist care. This situation underscores the need for better investment in health education initiatives as part of a broader strategy to strengthen primary care, as there is currently minimum reimbursement for this work.

The general practitioners (GPs) and primary care specialist physicians division further complicates the situation. While there is a steady flow of GPs (who have a one-year internship) coming from international and local schools of medicine, informants noted a scarcity of primary care specialists, such as pediatricians, internists, family physicians, and OBGYNs (who have at least a three year residency) which many considered better trained to treat chronic diseases and complex care patients. This shortage is partly attributed to the lack of financial incentives for medical students to pursue primary care specialties, as further studies in these areas do not offer significant monetary rewards.

There is no clear consensus on how to address the divide between GPs and primary care specialists. Some informants believe that relying too heavily on GPs, who may lack the advanced training required for managing complex conditions, contributes to inefficiencies in patient care and increases the burden on the already limited number of specialists. Others, however, argue that GPs are not being provided with adequate resources and support, such as access to specialty consultations, to effectively fulfill their roles. Additionally, GPs struggle to serve as coordinators of care because patients often bypass primary care providers and seek treatment directly from specialists, a practice that worsens the strain on the healthcare system and leads to fragmented care.

The healthcare system in Puerto Rico is significantly hampered by minimal investment in primary care and prevention. To improve health outcomes and create a more efficient system, there must be a concerted effort to bolster primary care, enhance health education, and implement a long-term strategy focused on prevention, health promotion and care coordination. This approach will require not only financial investment but also a shift in policy and public perception, ensuring that primary care is recognized and valued as the foundation of a robust healthcare system.

Domain 3: Drivers of Retention and Migration

Theme 3.1 – Medicare and Medicaid Funding Disparities

There is general consensus among stakeholders that funding disparities between Puerto Rico and Continental US Medicare and Medicaid reimbursement are THE root cause of the challenges facing the healthcare system on the island. As one interviewee stated, "*Puerto Rico will not be able to address the issue of the healthcare workforce unless there is a structural change in compensation in Puerto Rico. This is the first premise I wanted to make clear. Everything we do today is reflected in Medicare, Medicaid reimbursements, and Medicaid programs*."

The disparities are particularly evident when comparing the different types of health coverage. One interviewee noted, "*The patient's path depends on their coverage. In low-cost commercial coverage, networks are limited, and many are restricted in access and the time it takes to get an appointment*."

Another interviewee highlighted the impact of these disparities have on providers, stating, "*The issue now is the commercial rates. We are evaluating this, and obviously, there will have to be a response because doctors now say, 'Medicaid didn't pay before, now it pays better than commercial, then I have Medicare Advantage, so I don't prioritize the commercial patient.' That's a challenge*."

These funding disparities create significant financial strain across the healthcare system, leading to a shifting burden between sectors, which is ultimately felt by both providers and patients.

Theme 3.2 – Wage Index Differentials

The wage index in Puerto Rico presents a major challenge for the healthcare system, profoundly impacting compensation levels across the island. As explained by one interviewee, "*The Puerto Rico health system relies on federal funds for 85% of its income. This reliance means that any impact on reimbursement directly affects the entire system, including workforce compensation.*

For instance, the Wage Index for Puerto Rico in 2022 was at 40.53, which means we are compensating 40 cents on the dollar compared to the U.S. mainland. This creates a significant gap, indicating that as an industry, we are paying 60% less than what is paid in the U.S. Ten years ago, this gap was at 49%, so it has worsened over time. Puerto Rico faces a unique challenge where, for just $100 to $125, professionals can buy a plane ticket and move to the U.S. for positions that pay double or even more. This is a major issue, especially since 85% of our compensation comes from federal programs, all of which are heavily influenced by the Wage Index. Not only is there a substantial disparity, but this disparity has also increased by 20% over

the past decade." Informants stated that the continuous migration of professionals out of Puerto Rico is likely to persist unless sufficient incentives are offered to encourage them to stay or return to the island. Without addressing the wage index disparity, Puerto Rico will continue to struggle to retain its healthcare professionals, exacerbating workforce shortages and further straining the healthcare system.

Theme 3.3 – Stateside Shortages

Stakeholders representing academic programs cited aggressive recruitment practices from continental US healthcare recruiters of their graduates, with informants indicating that some programs have 100% of their graduates receive job offers in the United States. This phenomenon is driven by the significant demand for healthcare professionals across the United States, where the opportunities and economic incentives far surpass those available in Puerto Rico. As one interviewee noted, "Here, we don't have enough specialists to meet the demand, and this shortage is just as significant in the United States. They often recruit our professionals because they have the money to pay for it, and the working conditions there are not the same as here."

One interviewee highlighted the critical decision faced by students: *"It's always a question they ask themselves—should I stay in Puerto Rico or go? This decision is obviously conditioned by working conditions and economic remuneration*." Recruiters offer students to pay for their student loans, starting bonus packages, relocation expenses, fast-tracking their licensing/credentialling, access to technology, and providing a complete care team, among others. The allure of better pay and working conditions often tips the balance in favor of relocating to the U.S., particularly for specialized fields like nurse anesthetists, where "*85% are moving to the United States*" immediately after graduation.

This aggressive recruitment strategy is not limited to healthcare workers alone; even Puerto Rican universities are targeted by U.S. institutions looking to diversify their student bodies. As another interviewee pointed out, "*U.S. universities recruit our best-qualified candidates, offering attractive scholarships and incentives to move to their institutions, which helps them meet their diversity quotas. In essence, we provide the critical mass to fulfill their diversity requirements*."

This ongoing exodus of talent underscores the broader challenges faced by Puerto Rico's healthcare system where local educational institutions trains highly qualified professionals, only to see them drawn away by better opportunities in the States.

In Puerto Rico, the recruitment of physicians who have graduated from stateside universities faces significant challenges, primarily due to language barriers. Unlike healthcare organizations in other U.S. states that can recruit MDs from a wide range of medical schools, Puerto Rican healthcare institutions are limited by the requirement that all practicing MDs must be fluent in Spanish. This language barrier, coupled with wage disparities, makes it difficult to attract physicians from the mainland who may not be proficient in Spanish. As a result, Puerto Rico's healthcare system is at a disadvantage in recruiting and retaining talented physicians from stateside medical schools, further exacerbating the challenges of an already strained medical workforce.

Theme 3.4 – Residencies & Fellowships

Informants described that retention of medical doctors (MDs) in Puerto Rico is closely linked to where they complete their residencies and fellowships. They highlighted that physicians tend to live and practice where they match for their residencies and fellowships, making the availability of local residency programs crucial for addressing the healthcare workforce shortage. According to data from the AAMC, Puerto Rico is the second territory where the highest percentage of residency program graduates remain after completing their training.

However, the island faces significant challenges offering residency and fellowship opportunities. As one interviewee noted, *"Puerto Rico does not have enough slots for students from the four [local] medical schools, so they have to leave to do their residency*." This shortage of residency slots forces many newly graduated physicians to pursue their training in the mainland United States, where they often stay upon completing their residency due to attractive professional and personal opportunities.

The need for expansion of residency programs in Puerto Rico is further emphasized by the fact that "75% of physicians who complete their residencies in Puerto Rico tend to stay on the island," according to one stakeholder. However, the complexity and cost of these programs, coupled with the need to comply with high accreditation standards and government support, present ongoing challenges. Funding for new teaching hospitals and increased residency slots is needed to make this a reality.

The shortage of residency and fellowship opportunities contributes to the ongoing talent drain, with many graduates seeking better training and career prospects elsewhere. As one interviewee explained, "*The lack of residency and training opportunities is one of the main reasons for the talent drain, alongside better salary opportunities*."

Theme 3.5 – Recruitment packages

Starting packages and incentives are critical factors in the recruitment and retention of healthcare professionals in Puerto Rico. Competitive hiring packages are needed across the board. One interviewee highlighted the importance of financial incentives to attract and retain healthcare professionals: "*We need to look for economic help, like fundraising, grants, and stipends for students. These incentives are crucial for drawing attention to the health professions*."

As noted earlier, interviewees mentioned the aggressive recruitment efforts from stateside institutions, which offer attractive starting packages to lure new graduates. These packages often include substantial salaries, signing bonuses, relocation assistance, and opportunities for further education and training. This trend highlights the competitive nature of the U.S. healthcare job market, where Puerto Rican graduates are often drawn to the better compensation and benefits available on the mainland.

There was also a strong call by stakeholders for the development of loan forgiveness programs tailored to healthcare professionals who choose to remain in Puerto Rico for clinical or academic positions. One participant noted, *"We need to think about how we can create loan forgiveness projects for professionals who decide to stay and create incentives that balance the realities of salaries in academia versus the clinical environment*." The competitiveness of salaries and fringe

benefits between different healthcare settings is a significant factor, and addressing these differences is essential to ensuring that highly skilled professionals are not lost to other markets.

Additionally, interviewees emphasized the need for government and institutional support to enhance the local higher education and professional opportunities. For example, there is a push to develop fellowship programs that provide specialized training within Puerto Rico, helping to retain talent on the island. These efforts are seen as fundamental for improving the retention of medical professionals and ensuring that the healthcare system can meet the needs of the population.

Theme 3.6 – Professional Progress and Research

The challenge of retaining medical professionals who are interested in research and innovation is important in Puerto Rico. As noted in the interviews, many students interested in doing research are forced to leave the Island due to limited opportunities. The absence of fellowships and research programs forces them to seek opportunities elsewhere, particularly in the United States, where they can access better resources and funding.
An interviewee mentioned, *"One of the main reasons for talent drain are better salary opportunities and the part of residencies and training opportunities*," highlighting the difficulty in retaining talented individuals who could contribute significantly to the Island's healthcare system if the necessary support structures were in place. Additionally, there are issues related to how research income is taxed differently between private and public institutions. "*In the private sector, researchers have to pay income tax on their research project earnings, which is not the case for those in the University of Puerto Rico system*," said one respondent, pointing out how this disparity can drive researchers to seek better opportunities elsewhere.

Theme 3.7 – Quality of Life

Quality of life is a crucial factor influencing the job-related decisions of healthcare professionals in Puerto Rico, particularly when it comes to whether they stay on the Island or move to the mainland United States. The interviews reveal that while financial compensation is a significant consideration, it is not the only factor driving professionals away. The overall quality of life, including factors such as education for their children, work-life balance, and access to professional resources, plays a pivotal role in these decisions.
One interviewee emphasized the multifaceted nature of these decisions: "*Many don't necessarily leave just for the salary. They leave because where they are, they don't have good schools for their children, or they have to pay for private school, which increases their cost of living*." This quote highlights that even if salaries in Puerto Rico were competitive, other aspects of family life, such as the quality of education for their children and the cost associated with it, push professionals to relocate. Another interviewee pointed out how the overall living conditions in Puerto Rico compare unfavorably with those in other locations: "*Maybe I'm getting paid the same as I was in Puerto Rico, but in this other place, the public school is excellent, the cost of living is lower, I see fewer patients, and my family is happy. These are also important considerations*." Again, this statement underscores that the decision to leave is not solely about financial compensation but about a better overall living environment that offers a balanced life for both the professional and their family.

Furthermore, the rise of telemedicine has made it easier for healthcare professionals to live in Puerto Rico while working for U.S.-based companies, further complicating efforts to retain talent on the Island. One interviewee explained, "*There's an increase in companies in the U.S. recruiting psychologists and psychiatrists to support their members through telemedicine. They handle all the credentialing and billing processes. It's easier for the doctor, it guarantees a payment, and they can even do it from Puerto Rico.*" This quote illustrates how the convenience and financial security offered by U.S.-based telemedicine jobs make it challenging to keep professionals working within Puerto Rico's healthcare system.
In summary, quality of life considerations, ranging from education and work-life balance to the opportunities provided by telemedicine, are significant factors in the ongoing challenge of retaining healthcare professionals in Puerto Rico. These factors, often outweighing even competitive salaries, continue to drive health care professionals to seek better opportunities outside PR.

Domain 4: Potential solutions and future outlook

Theme 4.1 – Supply Side Solutions

Federal funds parity

The significant disparity in Medicare and Medicaid federal funding emerged as a central theme among informants, who cited it as the root cause of the severe health workforce shortages in Puerto Rico. Informants underscored the critical need for federal funds parity to address the financial constraints that impede PR's healthcare system's ability to compete with the mainland United States.

Informants indicated that this funding disparity represents a formidable barrier to sustaining a high-quality healthcare system on the island. Puerto Rico is required to meet the same federal standards as the states, yet it operates with significantly lower reimbursement rates. This financial imbalance severely hinders the island's ability to retain healthcare professionals trained on the Island, who often seek better financial opportunities in the mainland U.S. In addition to the wage disparity, the language barrier further complicates the issue making the recruitment of board-certified physicians that studied in other states practically impossible.

Informants emphasized the substantial costs associated with administering a healthcare system in Puerto Rico. Yet, despite having fewer resources, the island is expected to meet the same federal standards as the mainland. One informant noted, "*The island is very expensive, and the administrative cost of maintaining a high-quality healthcare system is high. We can't compete with the U.S. financially, and doctors can leave. We have lower rates but the same federal requirements. The government wants us to do more with less. They have to give us funds in the same way as the states to provide the quality of healthcare that patients deserve and to compete with the U.S. in paying healthcare professionals*."

These concerns were echoed by another informant, who highlighted the broader implications of funding disparities: "*This whole problem boils down to the disparity in money that the island has compared to the states, even though it has the same federal requirements and the same cost of medicine, especially with medications and medical equipment. The budget per patient in other*

states is $14k, and in PR, it is $5k—it's impossible to provide quality service with a budget three times less than any other state in the nation."

The financial disparity extends beyond immediate healthcare services to include long-term care (LTC) services, which are currently lacking in Puerto Rico. While Medicaid has received funds from CMS under the "Money Follows the Person" program to plan for LTC services, these services do not exist in PR. The timeline for addressing these issues is pressing, with an expected report due by 2025. However, achieving meaningful progress will require Puerto Rico to advocate for additional LTC funding from Congress to meet the needs of its aging population. Informants agreed that without parity, the island's healthcare system will continue to struggle to meet the needs of its population, maintain its workforce, and compete with the mainland United States.

Increased investment in residencies and fellowships

One of the critical strategies to address the healthcare workforce shortage in Puerto Rico is the expansion of medical residency programs. Efforts are currently underway to increase the number of residency slots, with the goal of retaining more medical graduates on the island. These initiatives involve collaboration among various healthcare institutions and educational bodies to strengthen the medical training infrastructure. However, the expansion has been slow and remains insufficient to meet the growing demand for healthcare professionals.

The limited availability of residency slots presents a significant challenge. Many medical graduates, unable to secure positions within these programs, seek opportunities outside Puerto Rico. This outmigration diminishes the effectiveness of residency expansion in addressing the workforce reduction. As one informant explained, "*Puerto Rico does not have enough slots to accommodate the students from the four medical schools. They have to leave [Puerto Rico] to do their residency*". The same phenomenon was cited for fellowships, which was noted as a factor contributing to the severe shortage of subspecialists trained in these programs. Another informant echoed this concern, noting, "*There are not enough residency slots, so many graduates continue to seek opportunities elsewhere*," thereby limiting the program's potential to retain talent within the island, as it was noted that once a medical student leaves the Island it is more difficult to get them to return.

Efforts are underway to increase the number of residency slots available in Puerto Rico. However, the success of these programs also depends on providing adequate incentives to hospitals to cover the expenses of medical residents. As one informant described, "*Without sufficient financial support, hospitals may struggle to sustain these residency programs, which could limit opportunities for recent graduates to receive the necessary training on the island*." Additionally, informants noted that many residents live on very limited budgets, which can make it difficult for them to focus on their training and professional development.

While there are initiatives aimed at expanding medical education and residency programs in Puerto Rico, informants cited that the current efforts fall short of what is needed to meet the growing healthcare demands and noted that efforts also need to be carried out so that once the students graduate from these programs they continue to practice on the Island.

Incentives for Medical School Students and Graduates

Supporting medical students and recent graduates through grants, loan repayment programs, and financial incentives tied to a commitment to practice in Puerto Rico was cited as important for retaining healthcare talent on the island. Medical students are currently being offered similar packages from stateside recruiters, and providing similar levels of financial assistance and reducing barriers to establishing a practice are key strategies that could play a significant role retaining them in Puerto Rico.

Scholarships and Loan Repayment

Several informants highlighted the need for initiatives aimed at providing scholarships and loan repayment assistance to medical students who commit to working in underserved areas on the Island. These programs aim to reduce the financial burden of medical education and encourage service in regions with the greatest need. Informants cautioned that these incentives need to be tied to a strong commitment (and enforcement) to practice in Puerto Rico after finishing their studies. In designing these programs, it is important that to take into account the benefits that are currently offered by stateside recruiters to make them attractive. This was noted as particularly important for certainly specialties. For example, healthcare professionals in fields such as gynecology, orthopedics, and pulmonology could receive additional annual payments. However, as an informant observed, while these incentives are a positive step, "*their effectiveness is somewhat limited due to the relatively low overall compensation compared to opportunities available in the United States.*"

Grants for Starting Independent Practices

Supporting recently graduated physicians in establishing their practices was also cited as a critical strategy for retaining talent within Puerto Rico's healthcare system. Several informants emphasized the need for grants to assist new doctors in setting up their offices. One noted, "*Grants would provide the necessary financial support for young healthcare professionals to reduce the economic barriers that often lead to outmigration*".

Other informants noted that some Medicare Advantage plans have begun offering office space to primary care physicians, allowing them to see patients without the need to establish a private office from scratch. While this support helps new professionals build their practices, some informants signaled that it was important to have caution regarding the effects of staff model health insurers.

Increasing Investment in High-Quality Nursing

Stakeholders raised concerns about the proliferation of nursing schools that do not provide practical training. As one informant noted, "*We need to put a stop to nursing schools that aren't up to par*." This creates a conundrum, because these programs were developed to create a higher volume of nurses to meet demand, but there seems to insufficient facilities to absorb nurses. This issue needs to be addressed with an approach that looks at both the supply and quality of education.

Another significant issue cited is the lack of differential pay for nurses with specialized training. For example, advanced practice oncology nurses, who require specialized training and skills to care for cancer patients, often do not receive significant additional compensation for their expertise. As one informant stated, "*Many nurses, such as oncology nurses, do not receive differential pay, especially in the public sector*." The lack of appropriate compensation for specialized nurses in the public sector not only undermines their motivation and job satisfaction but also contributes to a shortage of skilled nurses in critical areas. Addressing this issue requires increased investment in nursing programs that offer specialized training and ensuring that nurses who complete these programs are fairly compensated, regardless of their workplace setting.

Informants observed that by raising educational standards and ensuring fair compensation for specialized skills, the island can attract more individuals to the nursing profession and retain those who have already entered the field. This is particularly important given the growing demand for healthcare services and the critical role that nurses play in patient care.

Finally, the issue of ensuring that nurse-patient ratios are adequate was cited by informants. This is an issue that multiple States are struggling to address without a specific policy showing effectiveness over others. There have been various bills submitted to the legislature and have not been approved.

Enabling Funding for Workplace Learning

Informants emphasized the need to set up workplace learning programs to provide on the job training for the healthcare workforce. These programs were noted as crucial for bridging the gap between academic training and the practical skills required in real-world healthcare settings. By providing on-the-job training, mentorship, and continuing education opportunities, healthcare professionals can better adapt to the specific demands of the local healthcare system. This approach, according to informants, would not only improve patient care but could help retaining talent within the island, ensuring that healthcare professionals are fully equipped to meet patient needs.

Informants also suggested that collaborations with international medical institutions could be instrumental in this effort. Such partnerships could provide Puerto Rican healthcare professionals with access to advanced training opportunities and resources, helping them stay at the forefront of medical knowledge and practices. This approach was seen as not only enhancing the skills of local healthcare providers but also increasing the attractiveness of staying in Puerto Rico, as professionals would have greater access to high-quality training and development opportunities.

Securing adequate funding was identified as critical to the success of workplace learning initiatives. Without the necessary financial support, informants expressed concerns that healthcare institutions will continue to struggle to implement comprehensive training programs tailored to the specific needs of their workforce. Specifically, funding is needed to develop and sustain structured mentorship programs, specialized workshops, and courses designed to keep healthcare providers updated on the latest medical advancements and practices.

Enhancing Stable Reimbursement and Incentives for Providers

Preferential Tax Rate

Various informants underscored the significance of implementing a preferential tax rate as a strategy to retain and attract healthcare professionals in Puerto Rico. Informants questioned the effectiveness of the 4% preferential tax rate that was previously given to physicians, and shared anecdotal observations that some physicians had decreased the number of patients they see and indicating that the incentive had not increased the number of physicians on the Island. Others added that the 4% tax incentive had been critical in retaining physicians that would otherwise have left the Island, and that that it had brought some physicians out from retirement. Additionally, informants cited that there was minimal enforcement of the compliance with the requirements and that data on the effect was largely unavailable.

Informants recommended extending a preferential tax rate (not necessarily the 4%) exclusively to income generated from providing healthcare services to the local population or service in academia. This initiative was seen as a step toward aligning the incentives for doctors with the purpose of the measure which is to increase the health workforce supply. To qualify for this modified version of the 4% incentive, healthcare providers would be required to fulfill specific responsibilities toward the local population ensuring that the benefits of the tax reduction contribute directly to improving healthcare access and outcomes.

Increased Reimbursement Rates

Another key point raised by informants was the need to increase reimbursement rates for physicians. While informants recognized the need, they also expressed concerns regarding the impact of this initiative considering the lower premium rates for private insurance and Medicare Advantage benchmark in PR compared to rates in the states. While some participants commended the effort by the Administración de Seguros de Salud to increase reimbursement rates from 80% to 100% of the Medicare Fee Schedule for healthcare providers, others expressed concern regarding repercussions on the private insurance market which pays lower physicians fees. A few even posited that this could create shortages of physicians in the private insurance market and that it could lead to higher private insurance market premium rates which could increase the rate of uninsured.

Concurrent reviews and transparency in payment models

Providers signaled a problem with delays and reduced insurance reimbursement payments. They recommended conducting invoice audits concurrently with service provision to address this practice. This proposed strategy is aimed at identifying discrepancies and issues in real-time, thereby reducing the likelihood of payment disputes or delays. The concurrent audit process would ensure that the payments received are aligned with services rendered and with rates agreed upon in contracts. This would help avoid situations where hospitals and healthcare providers receive payments that are less than what was billed. The recommendation underscores the importance of having strong financial oversight mechanisms in place to maintain the financial stability of healthcare providers and ensure that they can continue to operate effectively.

Revamping the Licensing Process

A key area requiring reform within Puerto Rico's healthcare system is the licensing process for healthcare professionals. Informants shared that the current process is characterized by inefficiencies, untimeliness and interruptions. They indicated that licensing boards are sometimes understaffed or inoperant, which further exacerbates delays and contributes to the overall inefficiency of the licensing process. According to informants, a major obstacle to fully staffing these boards is the existing legislative requirement that board members be appointed by the Governor. Furthermore, despite the voluntary nature of these roles, appointees are required to complete financial disclosures, a stipulation that often deters qualified individuals from participating.

To effectively overhaul the licensing process, targeted legislative reforms are needed. Informants shared that reforms should aim to streamline the appointment process for board members, ensuring that all boards are fully staffed with qualified professionals. Such adjustments could enable boards to function more efficiently, reducing licensing delays and facilitating the timely accreditation of healthcare professionals.

Additionally, informants emphasized the imperative to digitize the entire licensing process. The current reliance on paper-based processes contributes significantly to inefficiencies and delays. Transitioning to an online system would simplify the application and renewal processes for healthcare professionals, allow for real-time tracking of application statuses, and reduce the administrative burden on both applicants and board staff. An online system would also improve record-keeping and data management, ensuring that all licensed professionals are compliant with regulatory standards.

Another component cited by informants was the establishment of reciprocity agreements with other states. Many healthcare professionals relocating to Puerto Rico hold licenses from other states, where they have already met stringent standards. Allowing these professionals to fulfill local licensing requirements using their existing credentials could significantly reduce barriers to entry for qualified practitioners. Reciprocity agreements with states that maintain comparable licensing standards could streamline this process.

Implementing such a system could ease the transition for out-of-state healthcare professionals and help address the shortage of providers on the island. Recognizing the credentials of out-of-state professionals could attract a broader pool of talent, thereby bolstering the quality and availability of healthcare services in Puerto Rico.

Uniform and Streamlined Administrative and Payment Processes

Participating healthcare providers in Puerto Rico reported inconsistency in administrative processes, particularly regarding documentation requirements across different health insurers as a major challenge. This lack of standardization imposes an unnecessary burden on healthcare professionals, diverting valuable time and resources away from patient care.

Providers frequently reported that the complex and ever-changing rules imposed by insurance companies make it nearly impossible to accurately forecast revenues for the coming year. They explained that this uncertainty stems from the inconsistent implementation of different payment

models across insurers, which creates confusion and administrative challenges. As an example, they shared that each insurer's unique interpretation of state-mandated payments exacerbates these issues, leading to financial strain on healthcare providers. To mitigate these challenges, there is a strong recommendation for government collaboration with health insurers to develop standardized and streamlined payment models.

Some of the key administrative processes that providers noted need to be standardized and streamlined include:

- Promotion of a "Any Willing Provider" Policy: Informants advocated for the implementation of an "Any Willing Provider" policy, which would require that any healthcare provider meeting the necessary credentials and willing to provide services under an insurer's plan must be allowed to do so.

- Uniform Credentialing Process: The need for a uniform credentialing process across all health insurers was also highlighted. The current lack of a standardized credentialing system leads to significant delays and administrative challenges, as healthcare providers must navigate different requirements for each insurer. A unified approach would reduce redundancy, save time, and facilitate easier practice across multiple insurance networks.

- Implementation of All-Payer Models: There was also a recommendation for adopting all-payer strategies that would standardize documentation and reimbursement processes across Medicaid, Medicare, and private insurers. Such strategies would ensure consistency in billing and reimbursement practices, thereby reducing the administrative burden on providers and allowing for more seamless interactions with different payer systems.

Innovation programs have already been funded to address the burden caused by the lack of standardization in documentation requirements across health insurers in other U.S. jurisdictions. In fact, recognizing the critical need to address these issues across the U.S., the CMS Innovations Center has funded various initiatives to align insurers and reduce these administrative burdens to promote standardization across the healthcare system.

Theme 4.2 – Demand side solutions

Specialty Consults and Care Coordination

Providers noted that specialty consultations play a crucial role in strengthening primary care by allowing primary care providers to collaborate with specialists or subspecialists on complex care cases. This approach could enhance the quality of care at the primary care level by leveraging specialist expertise without the need for direct patient referrals, which can often result in delays and the need to use emergency visits for specialty outpatient care. A leading example of this practice is *Project ECHO*, an innovative tele-mentoring model that connects primary care providers with specialists through virtual clinics. More information about Project ECHO is available on their website: https://echo.unm.edu/

Project ECHO offers a scalable solution to a challenge many providers currently address through informal methods, such as using WhatsApp to seek advice from specialists. As highlighted by healthcare leaders during interviews, implementing a structured system like Project ECHO would formalize these consultations, ensuring better documentation, accountability, and integration into patient care workflows.

Informants recommended taking the concept further towards the establishment of Centers of Excellence for managing chronic diseases. These centers would provide specialized, coordinated care for conditions such as diabetes, cardiovascular disease, and cancer, ensuring that patients receive comprehensive and continuous care. Informants view these centers as a critical component in improving health outcomes and reducing the long-term costs associated with chronic disease management.

Despite the clear benefits of specialty consultations and Centers of Excellence, significant barriers remain. Currently, specialty consultations are not reimbursed under existing healthcare payment models in Puerto Rico, making it financially challenging for providers to adopt these practices. Without reimbursement, or medical liability coverage, providers may be reluctant to engage in specialty consultations, limiting the potential for coordinated care.

Additionally, there is a lack of funding available to support innovation within Puerto Rico's healthcare system. The transformation required to implement specialty consultations, create Centers of Excellence, and integrate these initiatives into the broader healthcare system require major financial investment.

Investments in Interoperability

Developing a robust health information exchange system in Puerto Rico was consistently cited as essential for improving care coordination, reducing redundancy, and enhancing patient outcomes. Interoperability—the seamless communication and sharing of information between different healthcare systems—was noted as a cornerstone of an efficient healthcare system. Stakeholders emphasized the substantial benefits of such a system, as well as the significant challenges that must be addressed to achieve true interoperability.

One of the primary benefits of improved interoperability is the reduction of redundant tests and procedures. As noted by informants, "*In a fully interoperable system, one could share data and not repeat tests, not repeat labs, and have access to information that would provide the physician with a better scenario for decision-making and managing the patient*." This could streamline communication between systems, save time and resources, and ultimately enhance the quality of care.

A practical example of successful interoperability was highlighted by one healthcare provider: "*The interface between [our EMR] and PRIR allowed for seamless access to vaccination data, significantly reducing the need for manual data entry and improving access to critical health information*" and improving access to critical health information. Such efforts serve as a model for how other healthcare systems in Puerto Rico could benefit from enhanced interoperability.

However, significant challenges remain. One major barrier is the lack of trust among healthcare providers and institutions regarding data sharing. As one stakeholder pointed out, "*Until we establish that trust, this issue of interoperability will continue to face all kinds of problems because nobody trusts anyone*." Concerns over data security and the potential for competitive disadvantages contribute to a reluctance to share information, presenting both cultural and operational hurdles that need to be addressed.

In addition to trust issues, the financial investment required to develop and maintain interoperable systems is substantial. As one representative emphasized, "*We need more funding to invest in better technologies, otherwise, we will continue to lag behind*." While regulations exist to promote interoperability, economic constraints and the need for continuous technological upgrades present ongoing challenges. There is a pressing need for more funding to invest in better technologies to prevent the system from lagging behind. Significant public and private investment are needed to fund the development and maintenance of interoperable systems. This includes not only the initial setup costs but also ongoing expenses related to updates and training. Legislative and regulatory frameworks should also support interoperability by encouraging, or even mandating, data sharing across systems. These policies must also address local workplace cultural barriers that currently impede progress.

Investment in Infrastructure and Utilities

Informants indicated that investing in healthcare infrastructure is critical for the long-term growth and sustainability of Puerto Rico's healthcare system. This includes upgrading existing facilities with modern medical equipment, technology, and reliable utilities, such as electricity and internet services. These investments were cited as essential not only for delivering high-quality care but also for retaining healthcare professionals on the island.

One of the major challenges highlighted by stakeholders is the escalating cost of essential utilities, particularly electricity, which has been a significant factor in the closure of several hospitals. As one interviewee noted, "*Every day, the cost of energy keeps increasing, and the services offered depend on this utility. It is well known that this has been a determining factor in the cases of hospitals that have recently been forced to shut down operations*." This statement underscores the urgent need for governmental intervention to address rising energy costs in healthcare facilities, ensuring that hospitals can continue operating without the crippling financial burden of exorbitant utility bills.

Beyond physical infrastructure, investments in other utilities such as high-speed internet were cited as vital for adopting new healthcare technologies, including telemedicine and electronic health records. These technologies depend on stable internet connections to function effectively. Ensuring that healthcare facilities have access to these utilities is essential for the continued modernization of Puerto Rico's healthcare system.

To address the challenges related to infrastructure and utilities, stakeholders recommended policy support for energy costs. Implementing a government decree or policy could mitigate rising energy costs for healthcare facilities is essential. This could involve subsidies, tax breaks, or other financial incentives that enable hospitals and clinics to manage utility expenses without compromising care quality.

Payment Reform: Value-Based Payments

The transition to value-based payments (VBP) was identified as a crucial reform for Puerto Rico's healthcare payment system. Value-based payments prioritize the quality of care provided by healthcare professionals rather than the quantity of services rendered. This model incentivizes improved patient outcomes and cost-effective care. Some stakeholders emphasized the need to

move physicians towards "Pay for Performance" contracts. These contracts would encourage physicians to provide care at the appropriate level, educate patients effectively, and promote the use of primary care services when suitable. Providers who have advocated for establishing a uniform pay schedule across all payers argue that this approach could ensure fair and consistent compensation for healthcare providers, regardless of the insurer. A standardized pay schedule could also simplify billing and minimize discrepancies that currently exist between different payers.

Current payment models, particularly those involving Risk Adjustment Factors (RAF), were described as complex and burdensome. One participant stated, "*Each region had a unique premium, and now with the proposed RAF, we don't know what the premium is. It's an extremely complicated system, and we're not mature enough to code, and when I do, no one reconciles it to see the final premium*". This complexity increases the cost of providing services to providers, leading to delays in payment reconciliations were cited to stretch over several years. Providers cited frustration at the inefficiencies in the current system and advocated for a more straightforward, transparent payment process.

Participants also called for greater transparency in patient enrollment and risk-sharing agreements between insurers and healthcare providers. They argued that both parties should share risks and protections, ensuring that the financial burden does not fall disproportionately on one side. Stakeholders advocated for a centralized payment model where a single insurer manages payments. This approach could achieve economies of scale with networks of specialists and ensure that patients receive care within a well-coordinated system. One stakeholder suggested that in such a system " *[The provider] would only have one insurer, and that would help both the insurer and the [provider]*". The discussions reflected broader U.S. policy debates between fee-for-service and global payment models which require careful planning into the future.

Addressing Burnout

Burnout is widespread in Puerto Rico's healthcare system, significantly affecting the well-being and retention of healthcare professionals, especially nurses and doctors. It was noted that nurses are among the most impacted by burnout, often being described as "*the most unhealthy profession*" due to the severe physical and emotional toll their work takes. Long hours, high patient loads, and inadequate support contribute to the exhaustion experienced by many nurses. There is an urgent need for comprehensive support systems, including access to wellbeing resources and restructuring workflows to help mitigate these stressors.

Recommendations noted for Addressing Burnout include the following:

1. Comprehensive support programs - Implementing comprehensive support programs that address both the physical and emotional needs of healthcare workers is crucial. This includes providing access to mental health services, physical wellness programs, community support, and facilities like gyms and childcare centers that can help reduce daily stressors.

2. Creating a positive work environment - Cultivating a positive and supportive work environment is essential. As the demand for better working conditions grows, healthcare institutions must prioritize creating workplaces that support the well-being of their staff. This

includes ensuring reasonable work hours, providing adequate staffing levels, and fostering a culture of respect and collaboration.

3. Incentives for work-life balance - Offering incentives that promote work-life balance, such as flexible scheduling, paid time off, and opportunities for professional development, can help alleviate burnout and improve job satisfaction among healthcare professionals.

4. Investing in staffing and workflow design - Addressing the shortage of support staff, particularly in nursing, is essential to reducing the burden on healthcare providers. This could involve increasing wages for support roles, providing opportunities for career advancement, and improving overall working conditions for these critical positions.

Investment in Integrated and Alternative Care Models

Puerto Rico's healthcare system faces significant challenges, particularly in managing the growing demand for high-cost healthcare services. One of the key strategies identified by stakeholders to alleviate this burden is the investment in integrated and alternative care models that emphasize improving patient health through outpatient care and prevention. By focusing on these approaches, the healthcare system can reduce the strain on acute care services and enhance overall health outcomes, ultimately decreasing the need for more intensive and expensive treatments.

Support for Integrated Care Models

Integrated care models, which bring together interdisciplinary teams, were cited as crucial for improving patient health, especially for those with chronic conditions. These models focus on proactive management of health issues in outpatient settings, thereby preventing the progression of diseases that often lead to costly hospital admissions. For example, patient-centered care that coordinates services among various healthcare providers can ensure that patients receive timely and appropriate interventions, leading to better health outcomes. As noted in the interviews, "Implementing integrated care models that focus on patient-centered care and coordination among different healthcare providers can improve service delivery."

The inclusion of nurse practitioners, community health workers, and patient navigators in these teams was noted as a strategy for extending the reach of primary care and ensuring continuity of care. These professionals can manage routine health needs, educate patients, and help them adhere to treatment plans, all of which contribute to better health and reduced reliance on specialized and emergency services. By expanding the scope of practice for these mid-level practitioners and integrating them into care teams, the healthcare system can address gaps in primary care and minimize unnecessary referrals to specialists. As one informant shared, "*Strengthening support for clinical teams, including nurse practitioners and allied health professionals, can help fill the gaps in primary care and specialized services*."

Alternative Care Models Focused on Prevention

There was strong support cited for developing alternative care models that prioritize preventive care and address the social determinants of health. These models aim to improve patient health

by managing conditions early, thus preventing them from escalating into more serious issues that require acute care. Informants emphasized the importance of promoting care models that focus on prevention, stating that "*...promoting care models that focus on preventive care and addressing social determinants of health can reduce the demand for acute healthcare services*."

Investing in integrated and alternative care models is necessary to reduce the demand for high-cost health services in Puerto Rico. By focusing on outpatient care, prevention, and enhancing clinical teams, these models can lead to better health outcomes and lower the overall need for intensive medical interventions. If implemented effectively, these strategies can transform the healthcare system, making it more sustainable and responsive to the needs of the population while ensuring that patients remain healthier and less dependent on high-cost care.

Leveraging Innovation and Technology to Improve Patient Health

Investing in innovation and technology was mentioned as a way of improving patient health outcomes and managing workforce shortages.

Telehealth Expansion

Since the COVID-19 pandemic, telehealth has emerged as a crucial tool for improving access to care, especially in remote and underserved areas. By enabling healthcare providers to offer services without the need for physical presence, telehealth not only addresses geographical and transportation barriers but also provides more flexible work options for healthcare professionals. This flexibility can help retain talent on the island, particularly those who might otherwise leave due to the rigid demands of traditional in-person care. One example of a successful program developed using federal funding was cited as being instrumental in maintaining continuity of care for high needs patients. The program has also been used effectively in mental health care, providing services in a more private and comfortable setting for patients, which is particularly important in areas where stigma might otherwise prevent individuals from seeking help. However, informants noted that telehealth can only become a reality with adequate infrastructure and technological support. Without significant investment in these areas, especially in rural regions, the benefits of telehealth will likely remain limited. One informant also noted, *"We need to implement a strategy for telemedicine, allowing providers from the U.S. to serve the local population without requiring a Puerto Rican license. This would immediately improve access to care, particularly in underserved areas*".

Remote Patient Monitoring

Remote patient monitoring systems are viewed as a crucial innovation by informants. These systems enable continuous tracking of patients' health, particularly those with chronic conditions, reducing the need for frequent in-person visits. One informant explained that by providing real-time data to healthcare providers, remote monitoring can significantly improve the management of chronic diseases and prevent complications, thereby reducing the strain on the healthcare system.

Support for Innovation and Research

Encouraging innovation and research was also seen positively by informants, particularly through grants and partnerships with academic institutions. They believe that fostering an environment where new treatments and care models are developed and tested will help Puerto Rico stay at the forefront of medical advancements. This approach, they suggest, is key to improving health outcomes and reducing costs across the healthcare system.

Strengthening Primary Care

Strengthening primary care was noted as a fundamental strategy for improving patient outcomes and reducing demand for health services in Puerto Rico. As the first point of contact for most patients, primary care serves as the backbone of the healthcare system. However, to be truly effective, significant investments and structural changes are necessary to address the current challenges and gaps within the system. The implementation of robust primary care clinics that operate with extended hours and offer a comprehensive range of services was identified as essential by several informants. These clinics should be designed to accommodate more patients and provide continuous, coordinated care with specialists.

Long-Term Care in Puerto Rico

Stakeholders emphasized the positive impact that long-term care (LTC) services could have on Puerto Rico's aging population. They noted that this demographic change presents significant challenges to the island's healthcare system, highlighting the urgent need to develop and enhance long-term care infrastructure. They also noted that, unlike the U.S. mainland, where Medicaid often funds long-term care, Puerto Rico has historically lacked such coverage. Integrating LTC into Medicaid services, through initiatives like "Money Follows the Person," was identified as a critical step toward providing sustainable care for the elderly and disabled.

Interviewees also highlighted the need for a comprehensive LTC strategy that focuses on creating specialized LTC facilities and home-based care programs, allowing individuals to receive care in appropriate settings. They emphasized the need to train and support the workforce required for these services, such as home health aides and nurses, to ensure the delivery of high-quality care.

Finally, interviewees pointed to the importance of leveraging federal funding opportunities, such as those provided by Medicaid, as vital for building a robust LTC system. They called for collaboration between local and federal authorities to effectively utilize these funds and expand LTC services across the island.

Investments in Community-Based Prevention and Social Supports

Interviewees emphasized that investing in community-based prevention, lifestyle changes and social support systems is vital for the sustainability of our health system. They noted that these

investments are key to addressing the root causes of health disparities, reducing the demand for emergency and specialized services, and creating a more resilient healthcare system.

Interviewees highlighted the importance of investing in social supports that address factors like housing, education, and income. They pointed out that initiatives providing access to healthy foods, safe housing, and transportation can play a significant role in preventing chronic diseases and reducing healthcare costs over time, especially in areas with high poverty and unemployment rates.

The analyzed narratives point to the need to integrate behavioral health services into primary care and community health programs to ensure that mental health is addressed alongside physical health. Expanding access to behavioral health services and providing social services like case management could help individuals navigate complex healthcare systems and improve overall health outcomes.

Interviewees also underscored the importance of partnerships with local organizations, such as non-profits and community-based groups, for the success of community health initiatives. They noted that these organizations, with their strong ties to communities, can help build patient trust and engagement, ensuring that prevention and social support programs are culturally relevant and effectively meet the population's needs.

To reduce Puerto Rico's $1B pharmacy spending, interviewees emphasized the need to focus on prioritizing lifestyle modification as the first line of defense against chronic diseases, rather than relying solely on pharmacotherapy. They advocated for addressing the root causes of conditions like diabetes, hypertension, and cardiovascular diseases through changes in diet, physical activity, and behavior. This integrated approach, combining lifestyle changes with pharmacotherapy, when needed, was seen by interviewees as the most effective strategy for managing chronic diseases and lowering overall healthcare costs. Overall, interviewees agreed that investing in these areas is a cost-effective strategy for reducing the demand for costly medical interventions, improving quality of life, and creating a more equitable healthcare system in Puerto Rico.

Focus on Quality of Life

Interviewees emphasized that improving the broader socio-economic environment in Puerto Rico is crucial for enhancing the quality of life and making the island a more attractive place for healthcare professionals to live and work. They pointed out that addressing issues such as crime reduction, improving public transportation, and enhancing public education can create a safer and more stable environment, which is essential for retaining local talent and attracting healthcare professionals from outside the island. Additionally, they stressed that supporting families, particularly those headed by single mothers and caregivers.

Collaboration and Multistakeholder Planning

Interviewees noted that effective collaboration and multistakeholder planning are crucial for addressing the complex challenges of Puerto Rico's healthcare system. They pointed out that the fragmentation of services, competition among hospitals, stressed relationships between providers

and payers, and the need for comprehensive, integrated solutions underscore the importance of bringing together diverse perspectives to develop sustainable healthcare strategies.

Given the complexity of healthcare challenges in Puerto Rico, interviewees stressed the importance of adopting a "collage" of solutions that address various aspects of the issues simultaneously, rather than seeking a single solution. They noted that this collaborative, cross-sector approach is essential for comprehensively addressing the root causes of healthcare challenges.

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Health Care Workforce Survey Report

Commissioned by the Financial Oversight & Management Board for Puerto Rico

FTI CONSULTING™

Financial Oversight & Management Board for Puerto Rico

September 2024

Contents

Methodology

FTI Consulting conducted a survey among health care workers in Puerto Rico, including MD Physicians, PhD-level health care providers, nurses, allied health professionals, medical students and residents, and health care administrators from August 2 - September 13, 2024.

- We sampled each audience using a multi-dimensional database with data provided from public health care agencies, organizations, and companies to ensure validity of the respondents taking the survey.
- We leveraged mixed-mode recruitment for respondents using email and text-to-cell to maximize our response rates among this audience and exceeded most of our target quotas. We then weighted each individual health care worker audience to ensure the distribution of sub-specialties matches the composition of the databases provided.

For the student population:

- For legal reasons we were unable to interview students under the age of 21, so those below this age are not represented in the survey. In addition, current regulations prevented universities from sharing student databases, so no random selection of respondents was made. Instead, the universities sent invitations to all their students over the age of 21, and from these mailings we received 146 answers. Given these methodological limitations, the results from students should be considered exploratory and not necessarily representative of the entire population.

The data in the following slides shows weighted data for health care workers including physicians, PhD-level health care providers, nurses, and allied health providers. Data for students, residents, and administrators is unweighted.

MD/PHD PRACTITIONERS (TARGET SAMPLE=300)	
TOTAL	502
MDs	389
PHDs	113
GENERAL MEDICINE	94
OTHER SPECIALIST (MD)	90
OTHER SPECIALIST (NON-MD)	65
INTERNAL MEDICINE	36
PSYCHIATRIST/PSYCHOLOGIST	69
OTHER SPECIALISTS OF INTEREST	89
PEDIATRIC	36
OBSTETRICS & GYNECOLOGY	14
SURGERY	7

NURSES (TARGET SAMPLE=90)	
TOTAL	155
SPECIALIST NURSE	27
GENERALIST NURSE	128
ALLIED HEALTH PROFESSIONALS (TARGET SAMPLE=75)	
TOTAL	102
BEHAVIORAL & MENTAL HEALTH	2
PHYSICAL THERAPIST	19
RESPIRATORY - THERAPIST/TECHNICIAN	40
OTHER TECHNICIAN	40
ADMINISTRATORS (TARGET SAMPLE=75)	
TOTAL	75
STUDENTS/RESIDENTS (TARGET SAMPLE=300)	
TOTAL	**146**
STUDENTS	115
RESIDENTS	47

PRIMARY CARE PRACTITIONERS (n = 194)	
GENERAL MEDICINE	GERIATRICS
INTERNAL MEDICINE	OBSTETRICS & GYNECOLOGY
FAMILY MEDICINE	PEDIATRICS

PHYSICIAN SPECIALIST PRACTITIONERS (n= 173)		
ENDOCRINOLOGY	NUCLEAR MEDICINE	PSYCHIATRY
CARDIOLOGY	OPHTHALMOLOGY	NEUROLOGY
SPECIALTY IN ALLERGY & IMMUNOLOGY	OTOLARYNGOLOGY (ENT)	RADIOLOGY
ANESTHESIOLOGY	PATHOLOGY	ONCOLOGY
DERMATOLOGY	PHYSICAL MEDICINE & REHABILITATION	GENERAL SURGERY
EMERGENCY MEDICINE	PREVENTIVE MEDICINE	NEUROSURGERY
GENETICS & GENOMICS		PLASTIC SURGERY
MEDICINE		UROLOGY
		ORTHOPEDICS

Workforce Supply

Executive Summary

There is broad pessimism across health care professionals, driven by multiple factors.

- Nearly all health care workers (physicians, PhD health care providers, nurses, and allied health professionals) believe the sector is headed in the wrong direction.
- Underlying this pessimism are multiple factors including:
- *High individual patient volumes across groups.*
- *High levels of burnout, especially among nurses and allied health – which correlates with poor self-reported working conditions.*
- *Systemic concern related to worker shortages, and financial concerns (including wages/salaries) which most rate the top two biggest problems facing the sector right now.*

Most believe better pay is the answer to shortages, but other solutions are available

- While the obvious solution to all workforce groups is to improve pay, they admit other solutions are available like:
- *Reducing workload capacities which will help reduce burnout.*
- *Physicians and PhD HCPs believe reduced wait times for credentials – specifically from insurers – and reduced admin requirements will be effective at improving shortages.*
- *Nurses and allied health believe reduced training costs will help.*
- Most also believe the government should prioritize greater incentives for health care professionals, and improved recruitment efforts will positively impact the sector.

Many health care workers are considering leaving the sector or heading to the U.S.

- Across each group – physicians, PhD health care providers, nurses, and allied health – between a quarter to upwards of two thirds depending on the group, are currently seeking or considering a new job.
- Among physicians and PhD HCPs, most plan to stay in the sector, but there is a serious flight risk – especially among specialists seeking or considering new jobs, as half them say they are considering leaving for the continental United States.
- Meanwhile, nurses and allied health are much more likely to be seeking or considering employment OUTSIDE of health care – effectively exiting the sector.

Administrators are most focused on improving financial health and recruitment.

- Improving organizational finances is top of mind for administrators, who prioritize challenges like achieving better pay levels, improving flow and accuracy of payments, and reducing operational costs.
- Recruitment and retainment also ranks highly, with many focused on improving staff retention, and improving the effectiveness of recruitment/retainment.
- On the recruitment and retention front – administrators rank specialist and subspecialist physicians as both their highest priority *and* the most challenging group to recruit.
- While most admit to trying their best – there is plenty of opportunity to improve recruitment efforts.

Current State

Both specialists and primary care physicians spend 40+ hours per week caring for patients

While most physicians report working at an organization with less than 500 patients per week, specialists tend to work at higher volume organizations than primary care physicians and see more patients per day than primary care physicians.

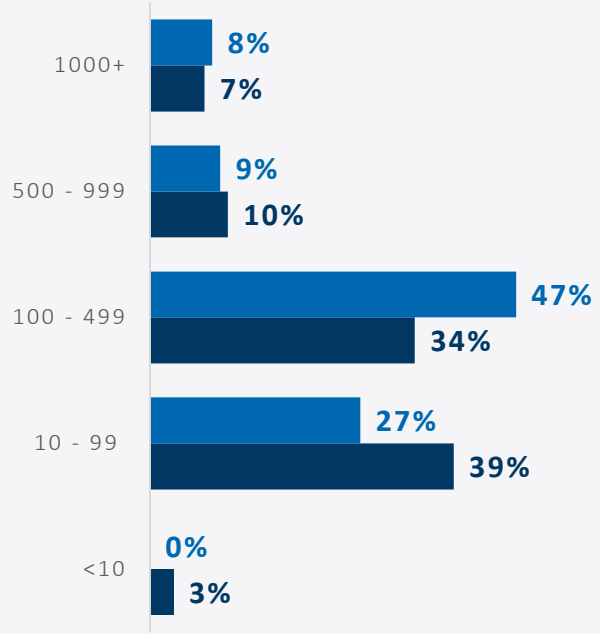
PHYSICIAN CURRENT STATE

PRIMARY CARE MD SPECIALIST MD

ORGANIZATIONS' WEEKLY PATIENT VOLUME

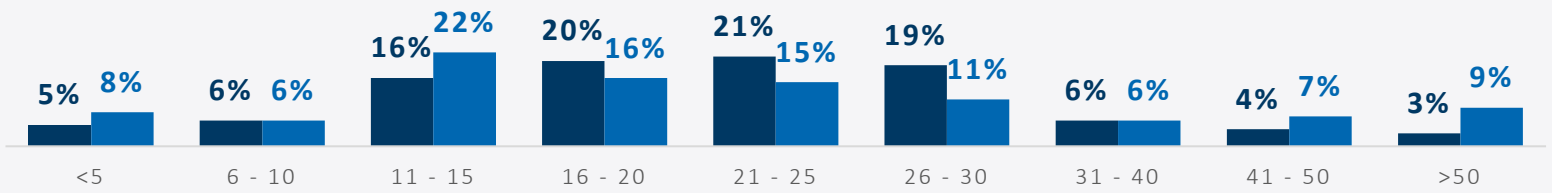
PCP ORG. AVERAGE WEEKLY PATIENT LOAD: ~269

SPECIALIST ORG. AVERAGE WEEKLY PATIENT LOAD: ~294



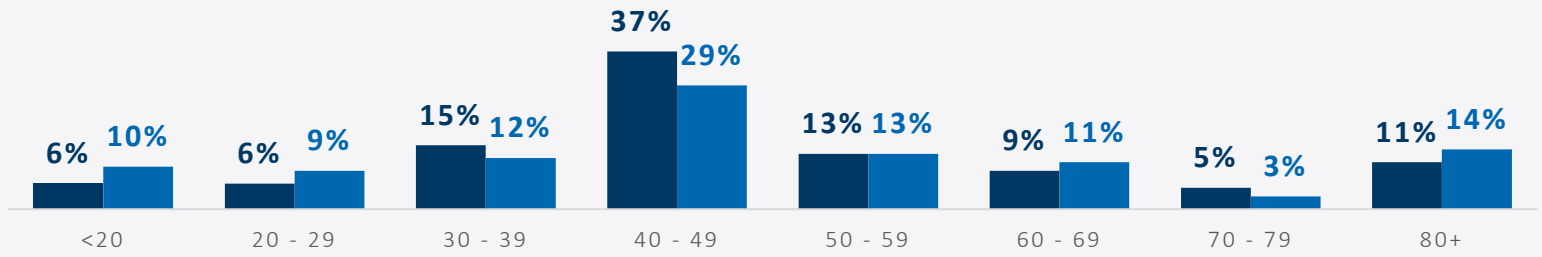
PHYSICIANS' DAILY PATIENT VOLUME

PCP AVERAGE DAILY PATIENT LOAD: ~21 *SPECIALIST AVERAGE DAILY PATIENT LOAD: ~23*



HOURS PER WEEK SPENT ON PATIENT CARE

PCP AVERAGE HOURS PER WEEK ON PATIENT CARE ~48 *SPECIALIST AVERAGE HOURS PER WEEK ON PATIENT CARE ~47*



Q30: En una semana típica y en promedio, ¿cuántos pacientes son atendidos en las organizaciones de salud en las que usted trabaja, sumándolas todas? | Q31: En un día típico y en turno típico de trabajo - ocho (8) horas, ¿cuántos pacientes atiende personalmente a través de todos sus lugares de trabajo? | Q36: En promedio, ¿cuántas horas por semana trabaja en actividades de cuidado directo a pacientes?

Physicians estimate that they spend roughly a third of their time per week on administrative duties, with most reporting they spend more time on patient care than admin

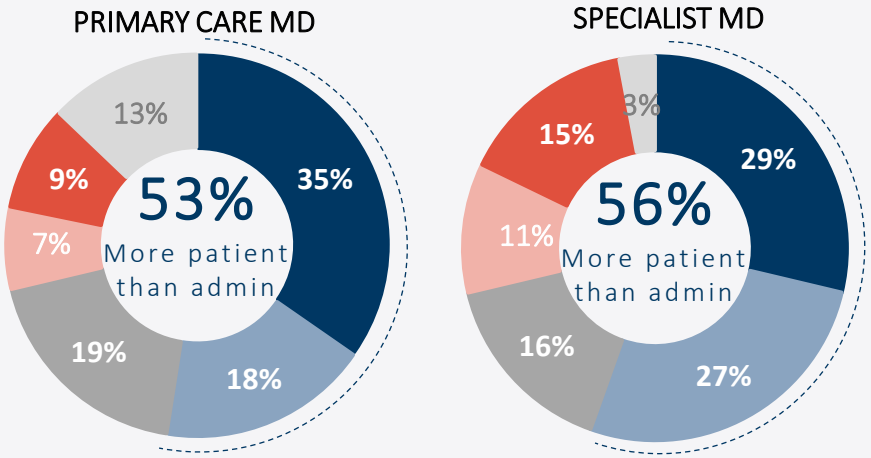
Specialists estimate slightly more admin time than primary care physicians, and are more likely to spend more time on admin than patients than primary care.

PHYSICIAN CURRENT STATE

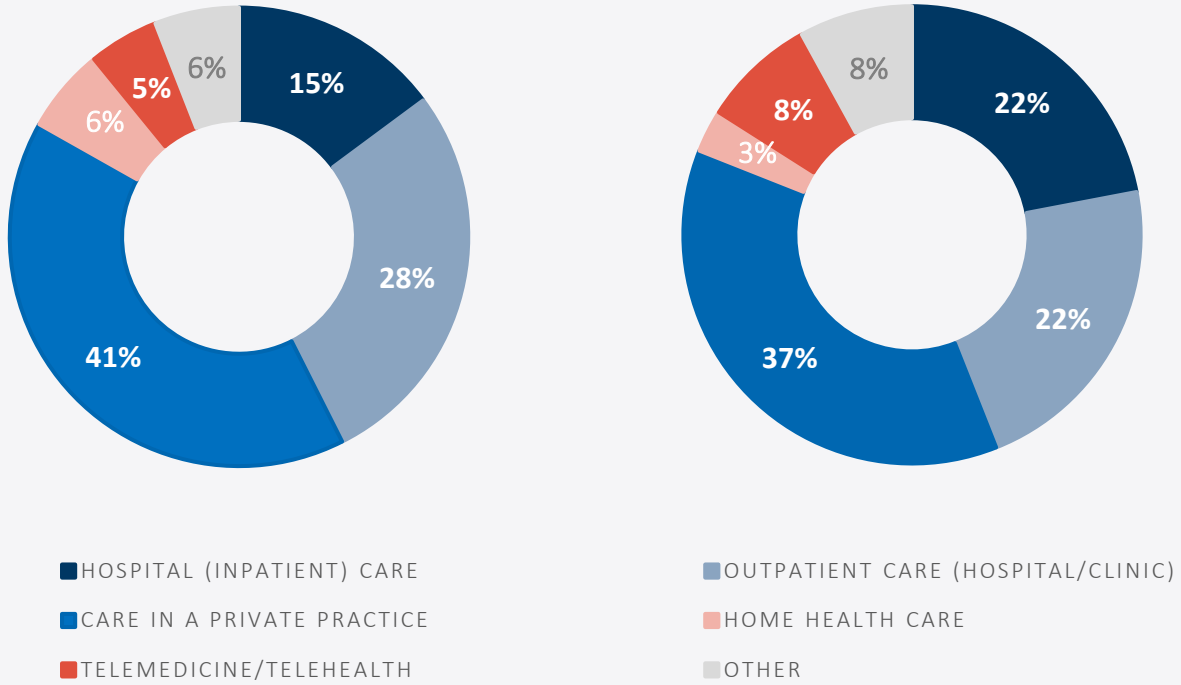
30% AVERAGE PROPORTION OF TIME PCP REPORTED SPENDING ON ADMINISTRATION

33% AVERAGE PROPORTION OF TIME SPECIALISTS REPORTED SPENDING ON ADMINISTRATION

TIME SPENT ON PATIENT CARE VS. ADMIN WORK



AVERAGE TIME SPENT PER MONTH IN DIFFERENT CARE SETTINGS

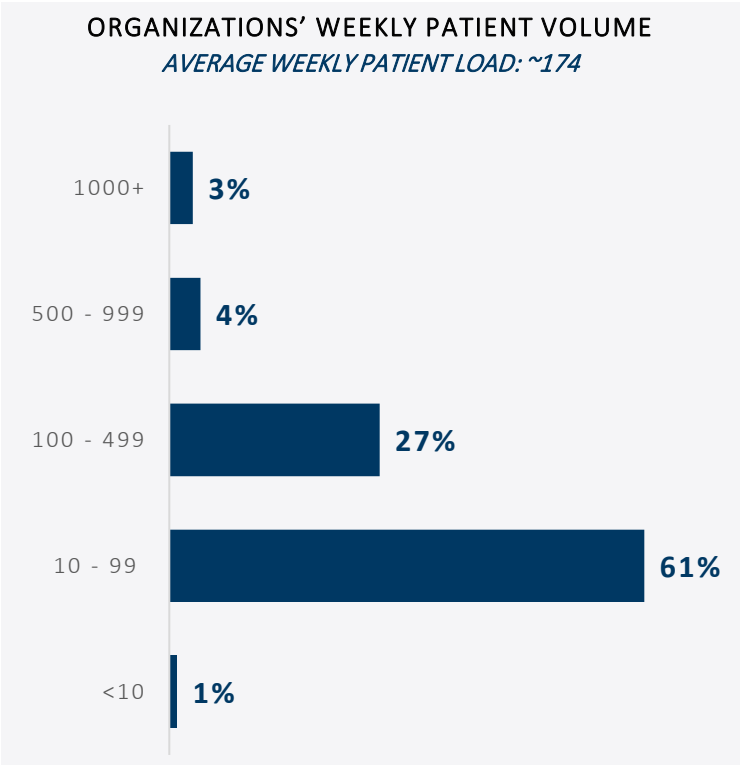


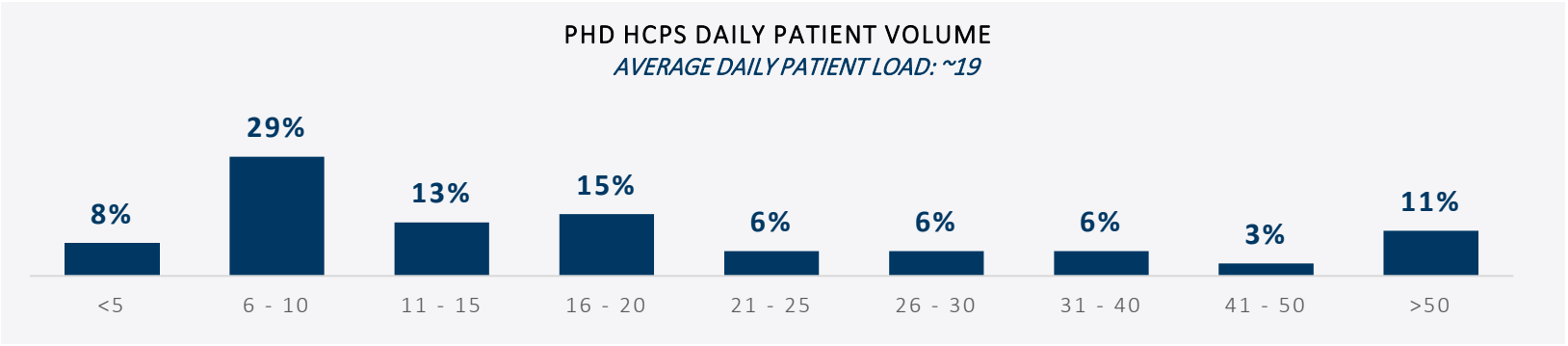
Q37: Pensando en su trabajo, ¿cómo describiría la distribución de su tiempo entre la atención al paciente y funciones administrativas? | Q38: Viendo este tema de otra manera, ¿qué porcentaje de su tiempo está dedicado a trabajo administrativo? | Q39: ¿Cuál es el porcentaje promedio de tiempo por mes que le dedica a los siguientes escenarios?

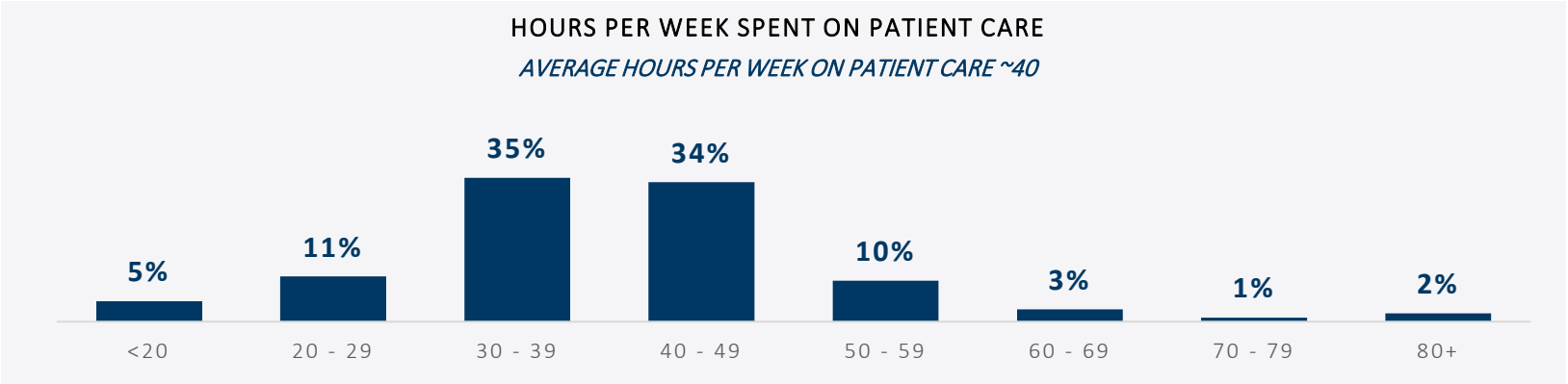
PhD level health care providers report lower patient volumes – personally and at the organizational level – than physicians.

Most tend to spend 40 hours per week on patient care, and see on average 19 patients per day.

PHD HEALTH CARE PROVIDER CURRENT STATE







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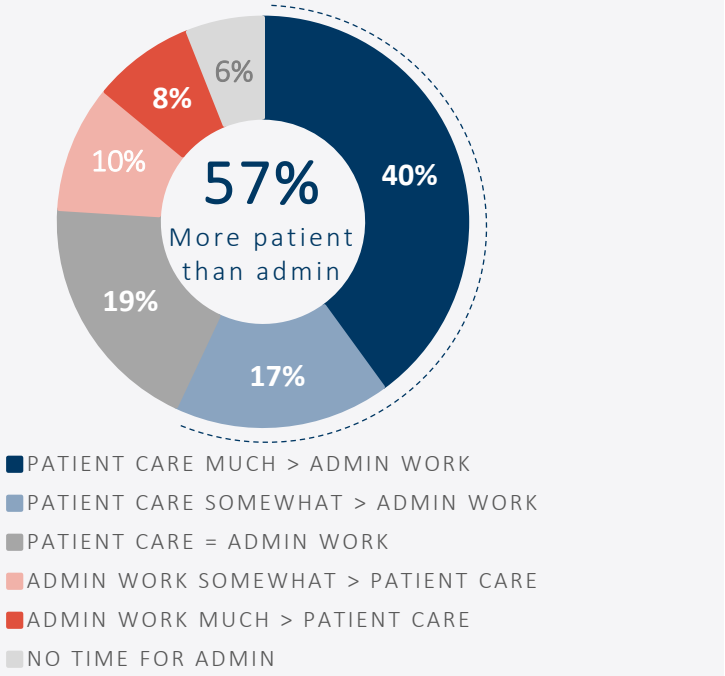
PhD HCPs report spending just over a third of their time per week on admin work, and spend more time on patient care than administrative work.

More than half of HCPs report working in private practice.

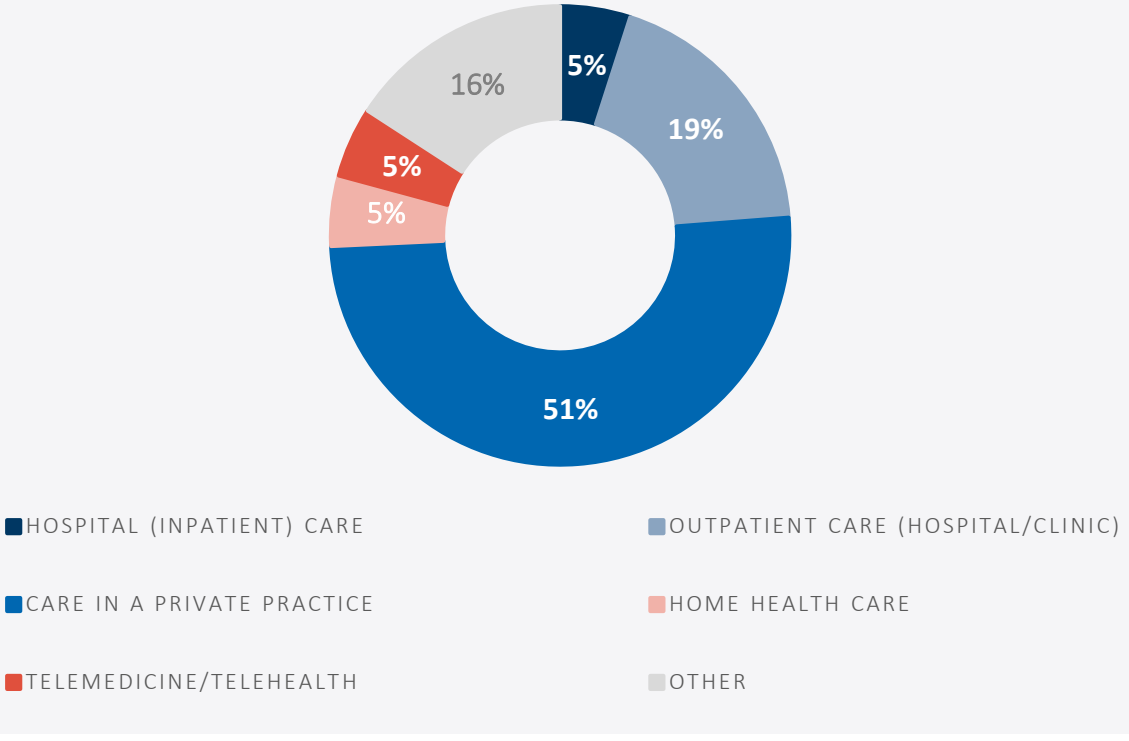
PHD HEALTH CARE PROVIDER CURRENT STATE

35% AVERAGE REPORTED PORTION OF TIME SPENT ON ADMIN WORK

TIME SPENT ON PATIENT CARE VS. ADMIN WORK



AVERAGE TIME SPENT PER MONTH IN DIFFERENT CARE SETTINGS



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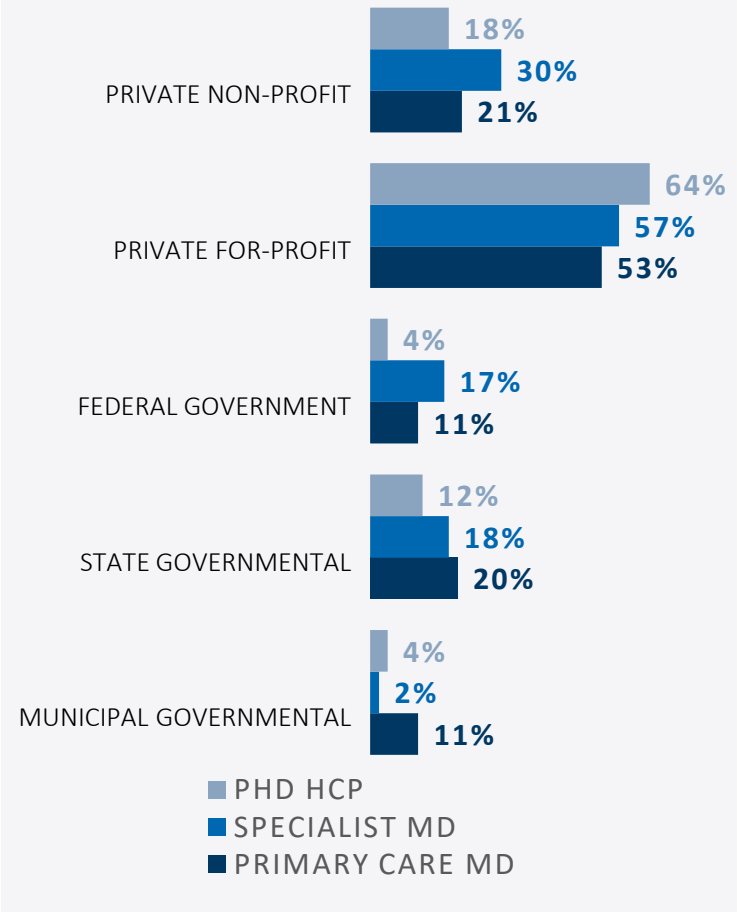
Most physicians and PhD health care providers work at private for-profit entities. With the bulk of physicians and PhDs working in private medical offices, health clinics, and hospitals.

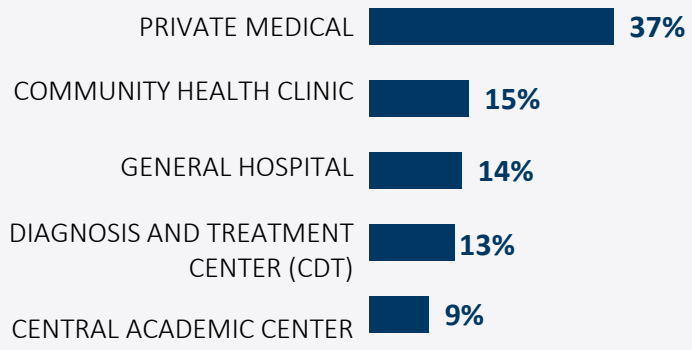
While all respondents work in the Puerto Rico, specialists most likely to report also working in the United States.

ENTITY EMPLOYED AT

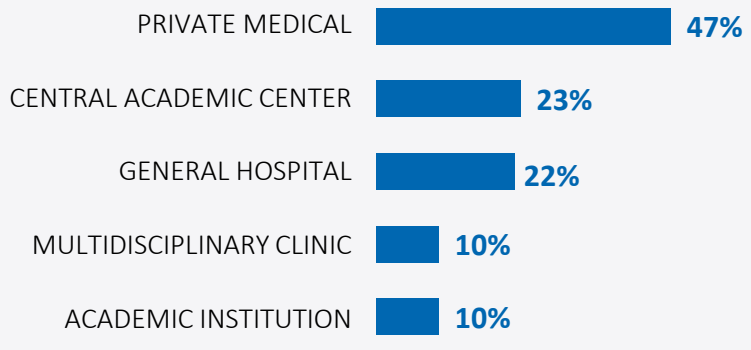


CURRENT ORGANIZATION EMPLOYED AT

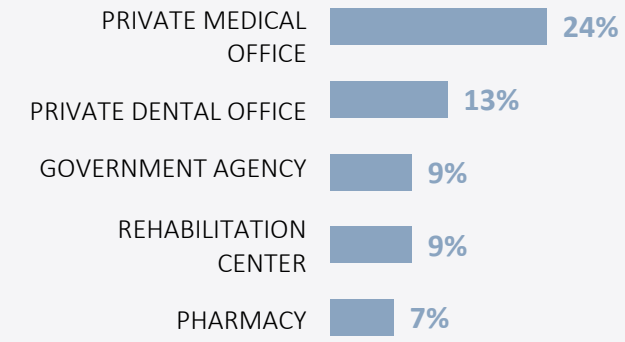
PRIMARY CARE MD



SPECIALIST MD



PHD HCP



WORK LOCATION

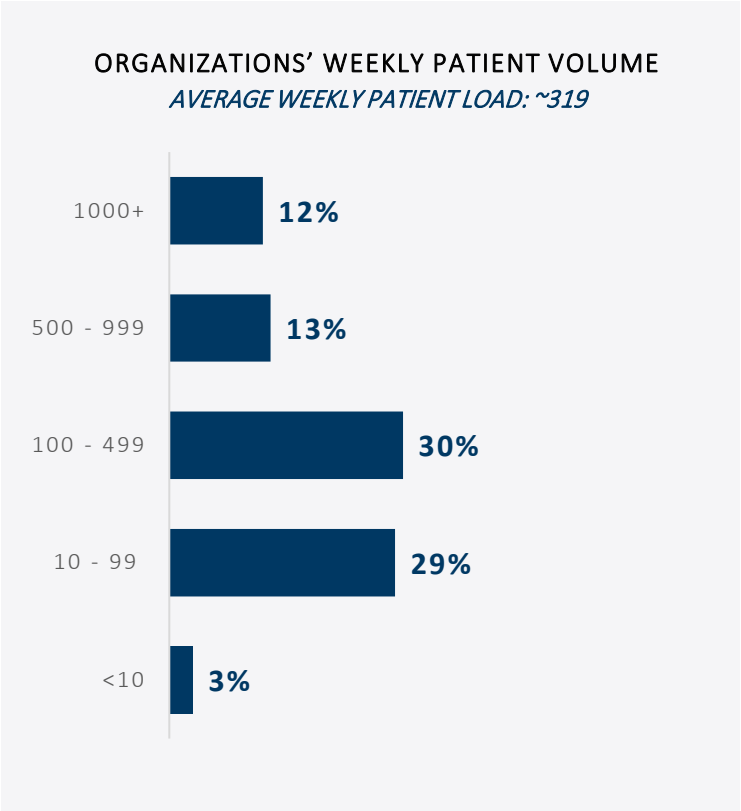
100%	WORKS IN PUERTO RICO	PRIMARY CARE MD SPECIALIST MD PHD HCP
2%		PRIMARY CARE MD
10%	WORKS IN USA	SPECIALIST MD
6%		PHD HCP

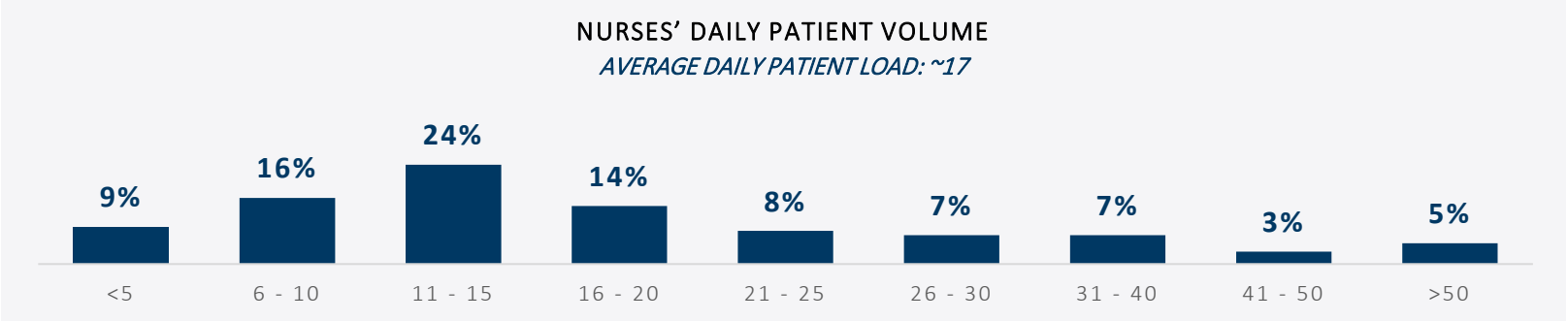
Q10. ¿Cuál de las siguientes categorías mejor describe las entidades que prestan o manejan servicios de salud en Puerto Rico en las que usted trabaja actualmente? | Q11. ¿En cuáles de las siguientes organizaciones que prestan o manejan servicios de salud en Puerto Rico usted trabaja actualmente?

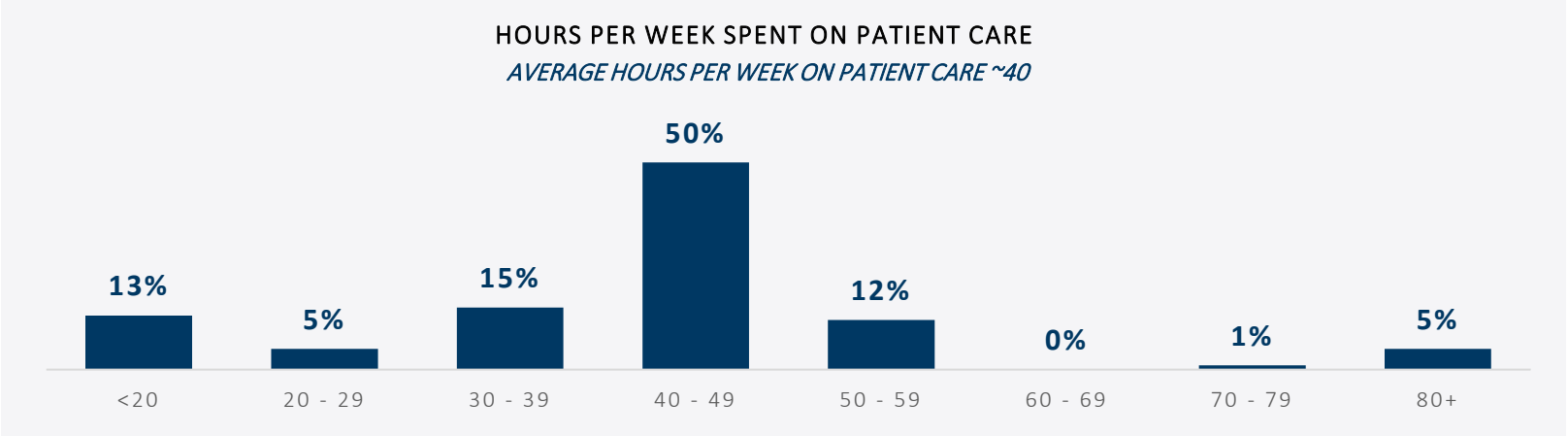
Nurses report seeing roughly 17 patients per day on average, with most spending 40 hours or more on patient care.

Similar to physicians, most nurses work in organizations that see less than 500 patients per week.

NURSE CURRENT STATE







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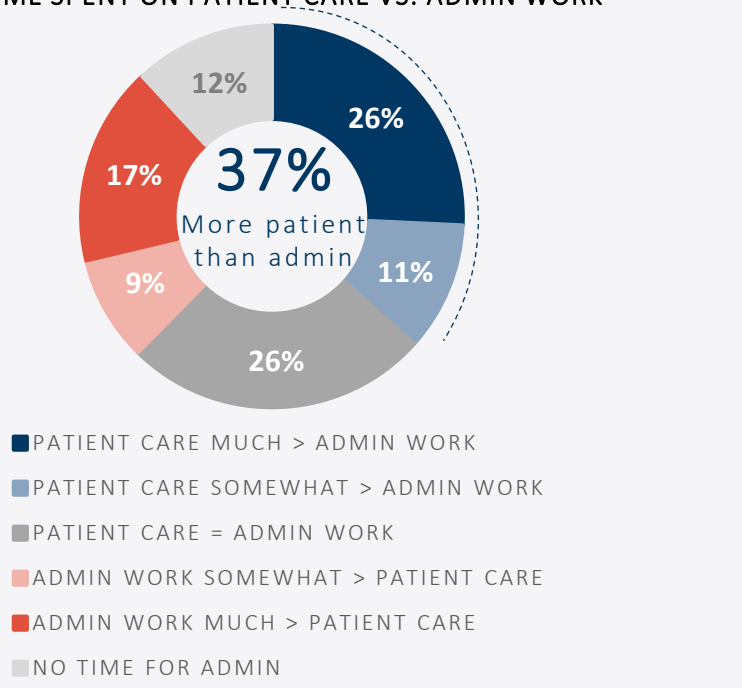
Nurses report higher levels of time spent on admin than doctors, and are much less likely to spend more time on patient care than admin

More than a quarter of nurses say they spend more time on administrative duties than patient needs, estimating 41% of their time on administrative work per week. Most report working in a hospital – with the bulk being in inpatient care.

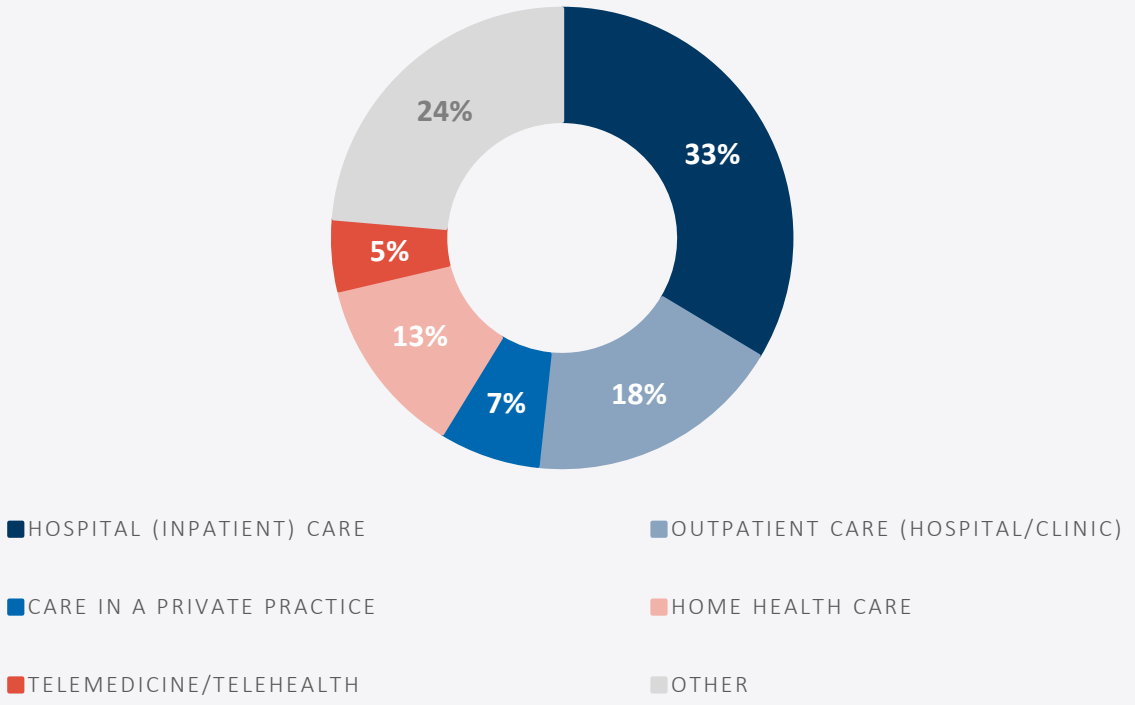
NURSE CURRENT STATE

41% AVERAGE REPORTED PORTION OF TIME SPENT ON ADMIN WORK

TIME SPENT ON PATIENT CARE VS. ADMIN WORK



AVERAGE TIME SPENT PER MONTH IN DIFFERENT CARE SETTINGS



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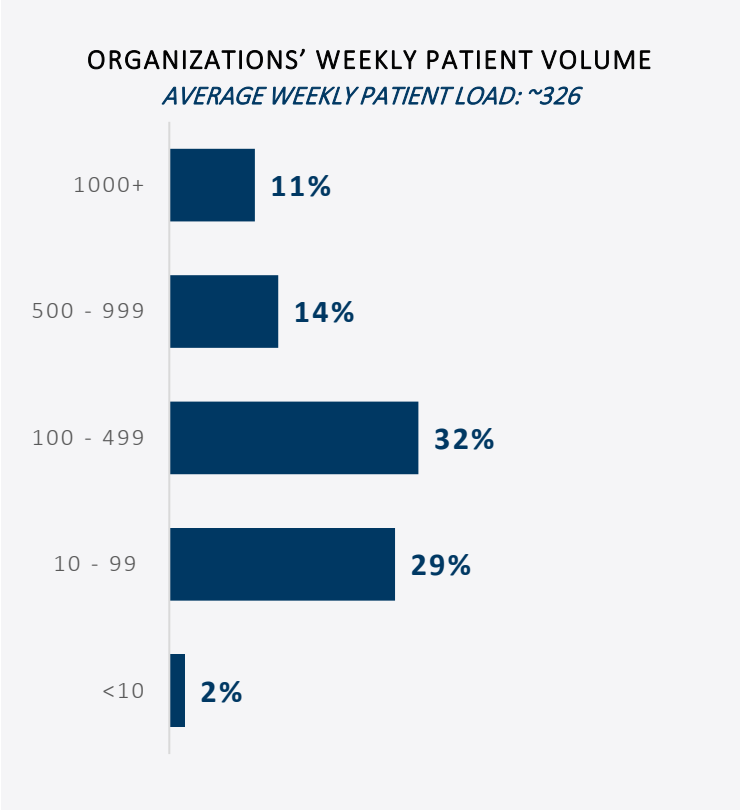
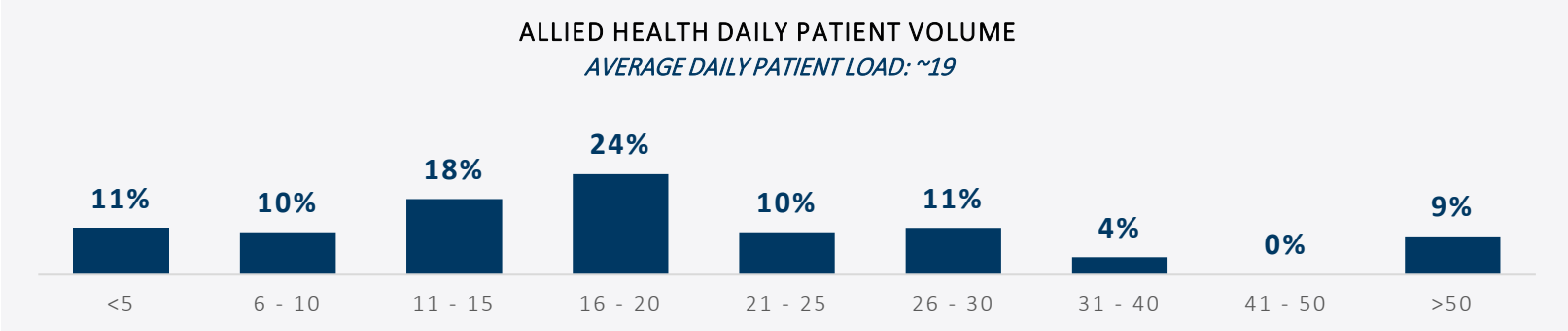
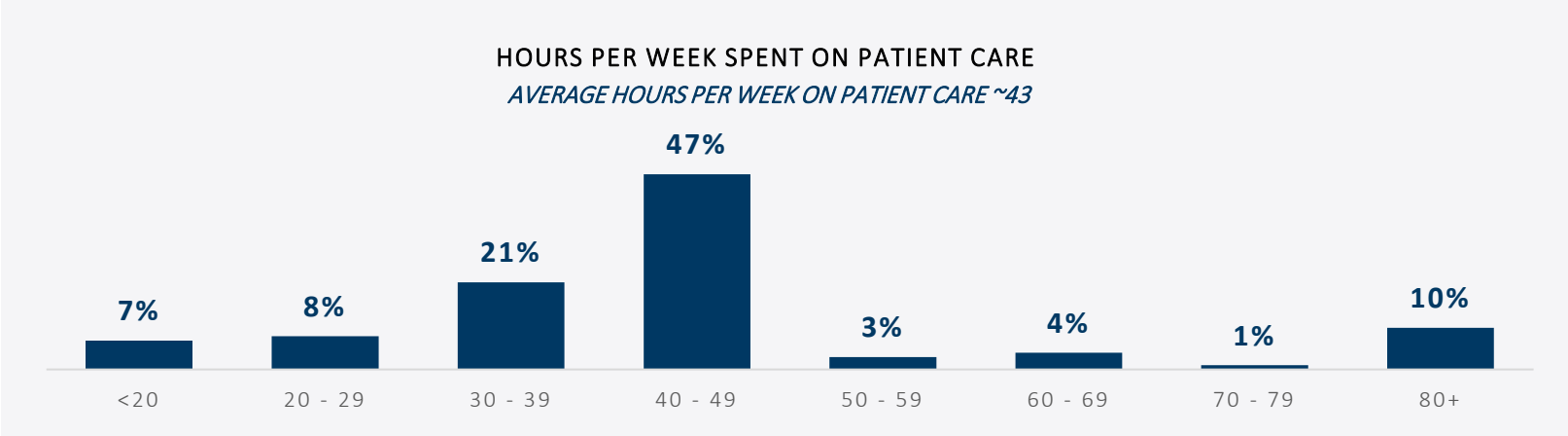
Allied health workers report seeing slightly more patients than nurses, and spending slightly more time on average on patient care.

Allied health report working in organizations with slightly higher weekly patient loads than their other health care worker groups.

ALLIED HEALTH CURRENT STATE







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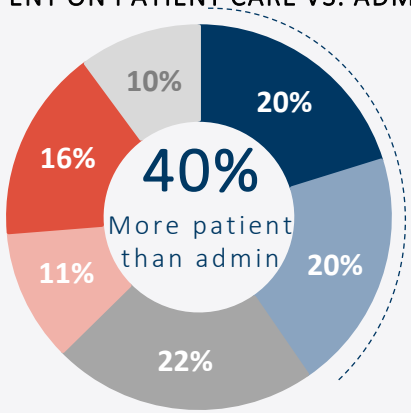
Similar to nurses, allied health report spending more time on admin work, and are less likely to report spending more time on patient care than admin

More than a quarter of allied health workers report spending more time on administrative duties than patient care, estimating they spend over a third of their time per week on administrative work.

ALLIED HEALTH CURRENT STATE

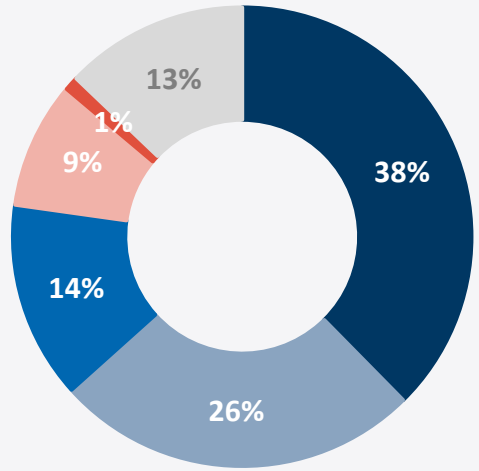
38% AVERAGE REPORTED PORTION OF TIME SPENT ON ADMIN WORK

TIME SPENT ON PATIENT CARE VS. ADMIN WORK



- PATIENT CARE MUCH > ADMIN WORK
- PATIENT CARE SOMEWHAT > ADMIN WORK
- PATIENT CARE = ADMIN WORK
- ADMIN WORK SOMEWHAT > PATIENT CARE
- ADMIN WORK MUCH > PATIENT CARE
- NO TIME FOR ADMIN

AVERAGE TIME SPENT PER MONTH IN DIFFERENT CARE SETTINGS



- HOSPITAL (INPATIENT) CARE
- OUTPATIENT CARE (HOSPITAL/CLINIC)
- CARE IN A PRIVATE PRACTICE
- HOME HEALTH CARE
- TELEMEDICINE/TELEHEALTH
- OTHER

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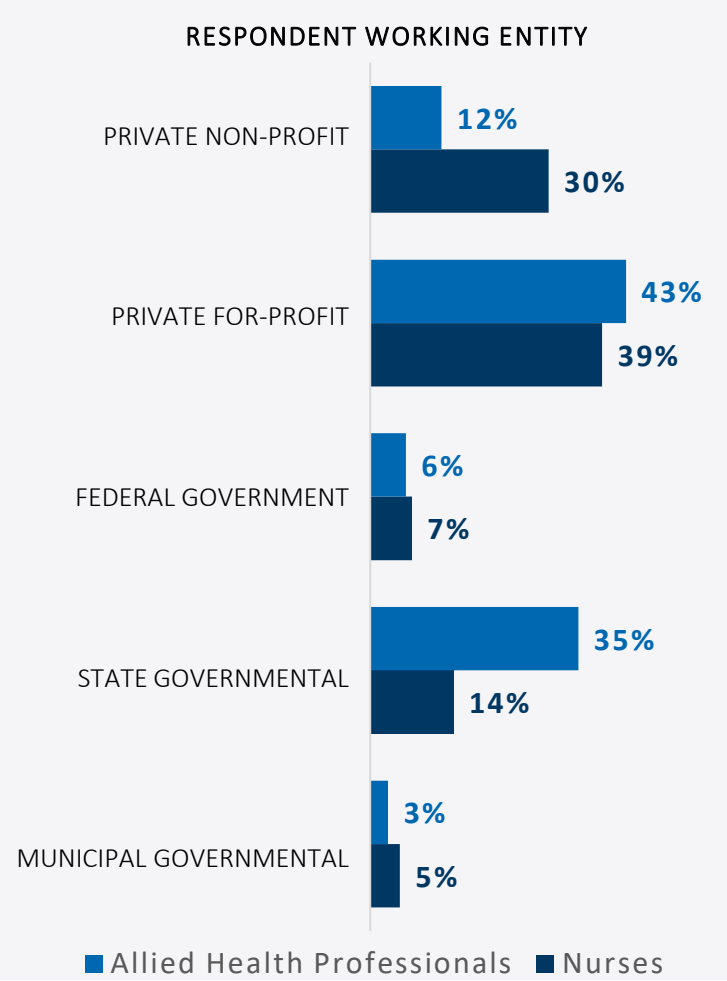
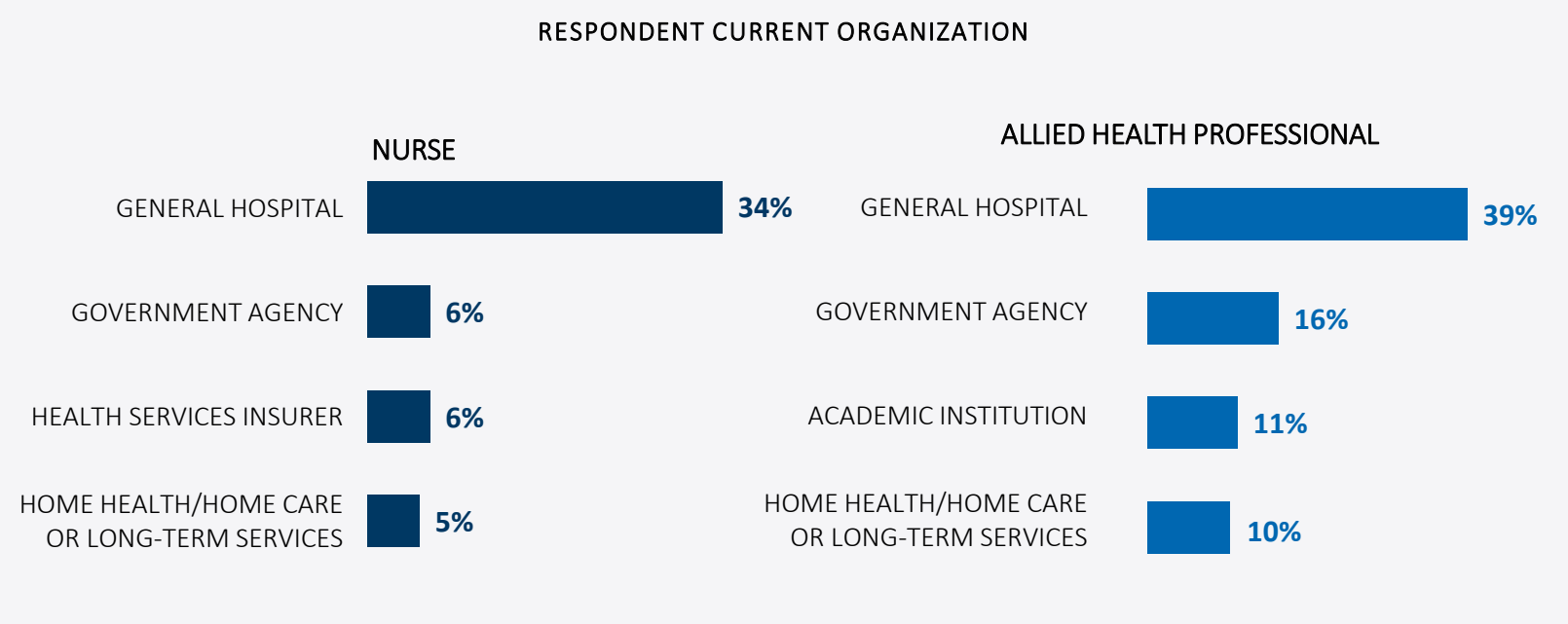
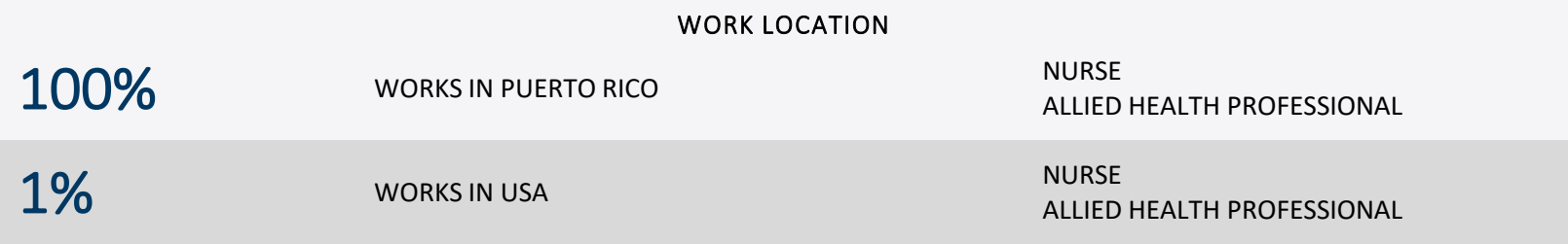
Nurses and allied health similarly report working at private for-profit organizations, with the bulk indicating that they work at a hospital.

More than a third of allied health work for state governmental entity, while more than a quarter of nurses work at a private non-profit







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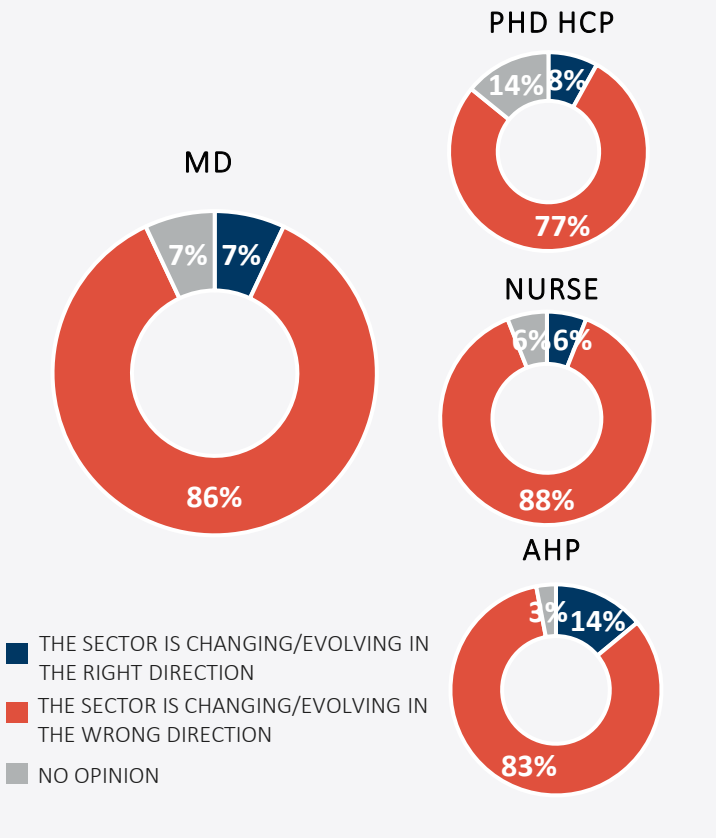
Landscape

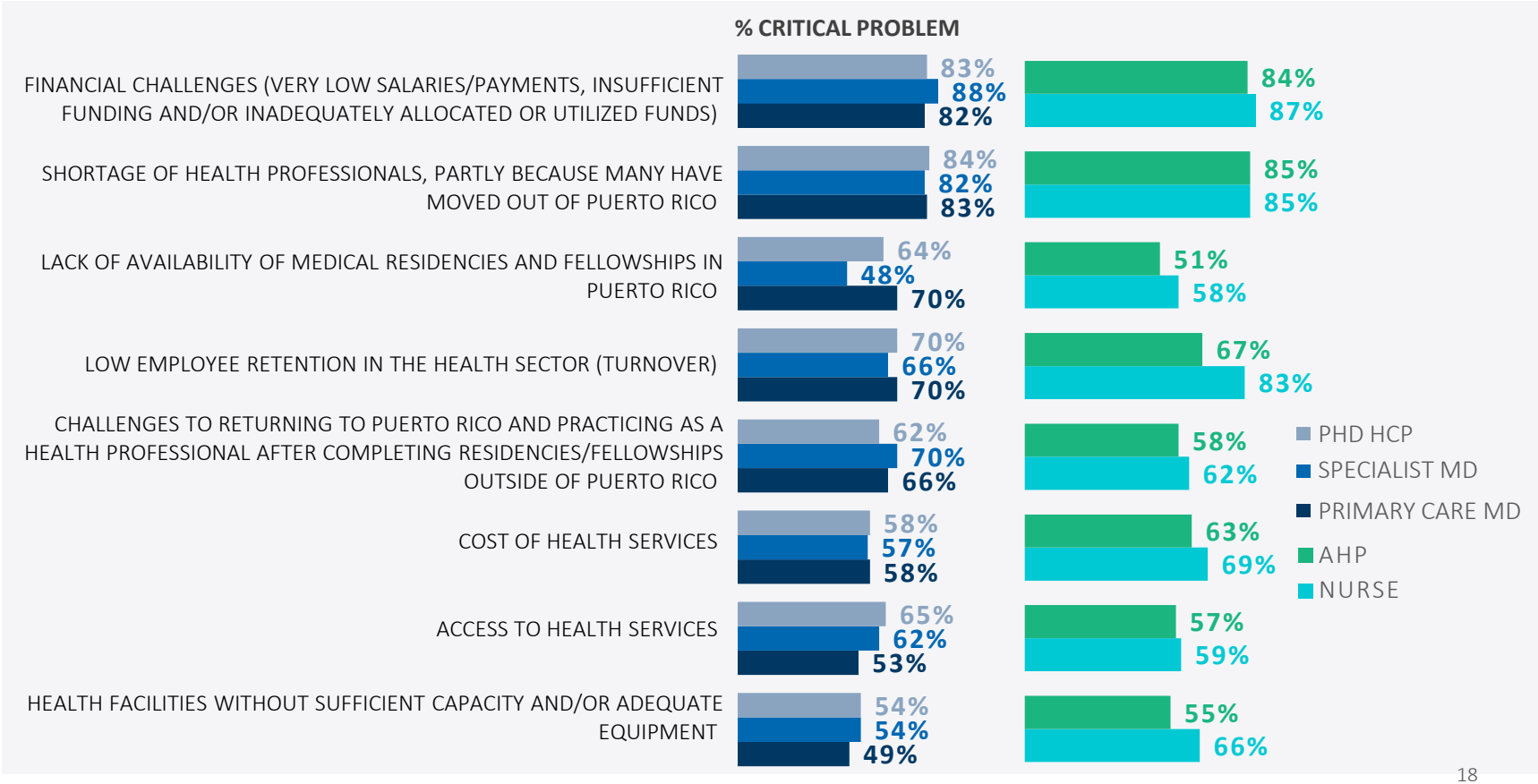
There is broad pessimism about the future of Puerto Rico's health care sector, driven by attitudes around worker shortages, financial challenges, and low employee retention.

Nurses tend to be most pessimistic. Primary care physicians are especially concerned about the lack of medical residencies and fellowships, while nurses are highly concerned about turnover and shortages.

THE DIRECTION OF THE HEALTH CARE SECTOR



BIGGEST PROBLEMS FACING HEALTH CARE SECTOR

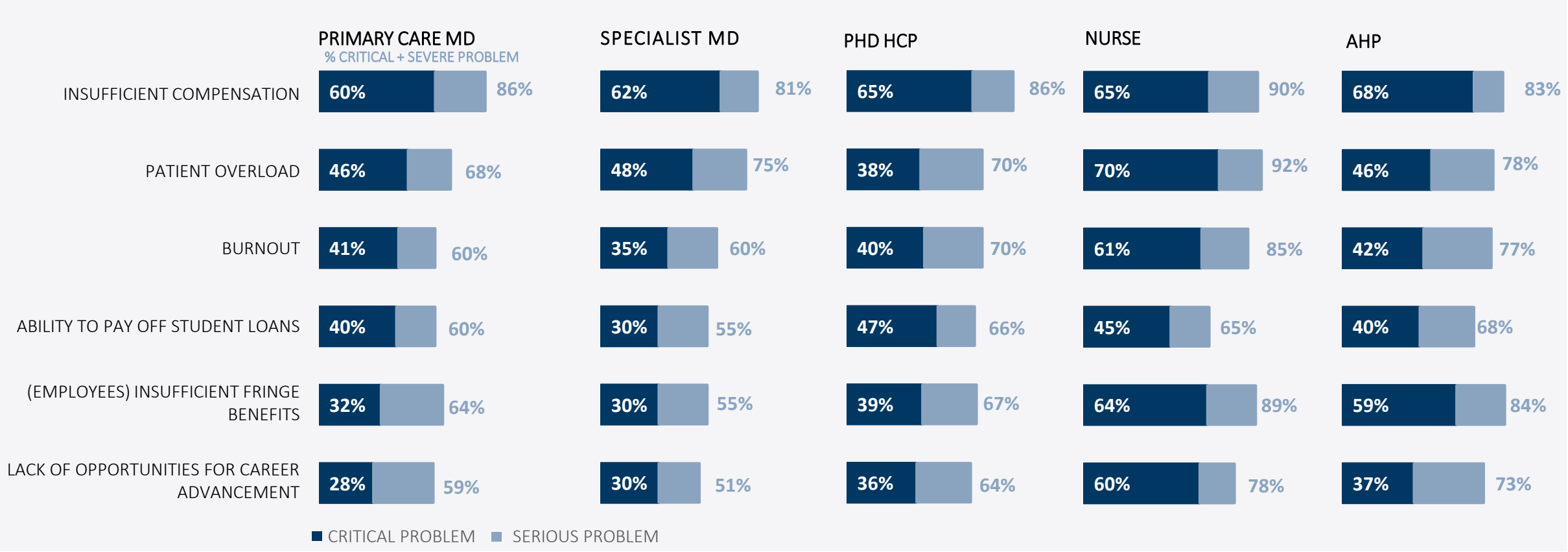


Q33. En términos generales, ¿cómo describiría el estatus del sector de salud de Puerto Rico? | Q34. A continuación encontrará una lista de posibles problemas a los que se enfrenta el sector de salud de Puerto Rico. Para cada uno de estos problemas, por favor califique la magnitud del problema utilizando la escala que se proporciona a continuación.

Low pay is *the* top problem for most groups, followed by patient overload which nurses report as their top problem.

While poor fringe benefits is not top of mind for physicians, it IS for nurses and allied health. Physicians – especially primary care and PhD HCPs – are more worried about their ability to pay off student loans.

BIGGEST PROBLEMS FACING HEALTH CARE WORKERS

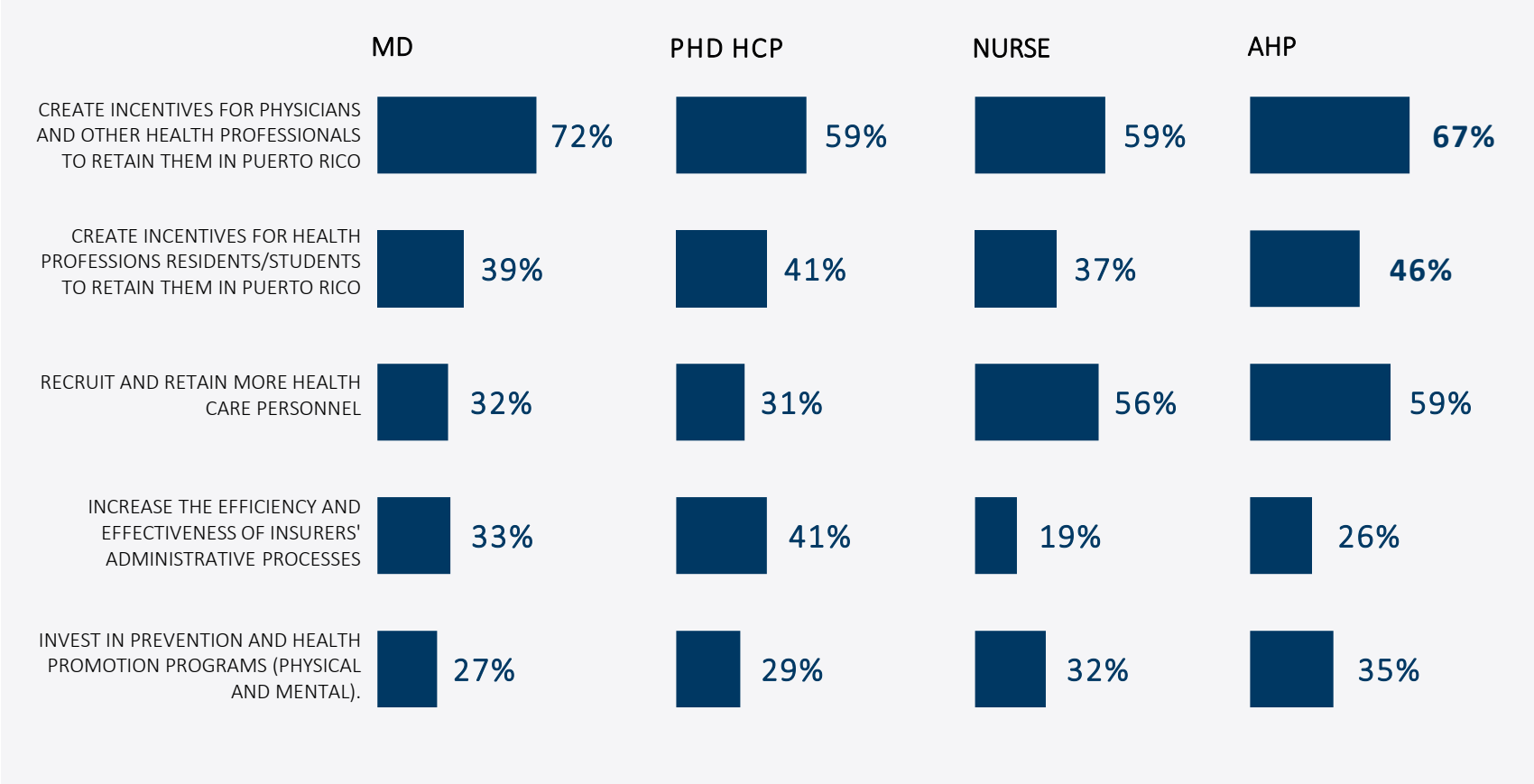


Q72. A continuación encontrará una lista de problemas a los que profesionales de la salud pueden enfrentarse, en la tabla indique en qué medida cada uno es un problema para usted personalmente.

All agree that creating incentives for health care workers to stay in Puerto Rico should be the top priority for the government. AHPs and nurses also put high priority on improving recruitment.

More incentives for students and residents is a secondary priority for many, though comes in a distant second for doctors and PhD health care providers.

PRIORITIES FOR PUERTO RICO GOVERNMENT OFFICIALS



72% OF PRIMARY CARE MDS AND

73% OF SPECIALSITS

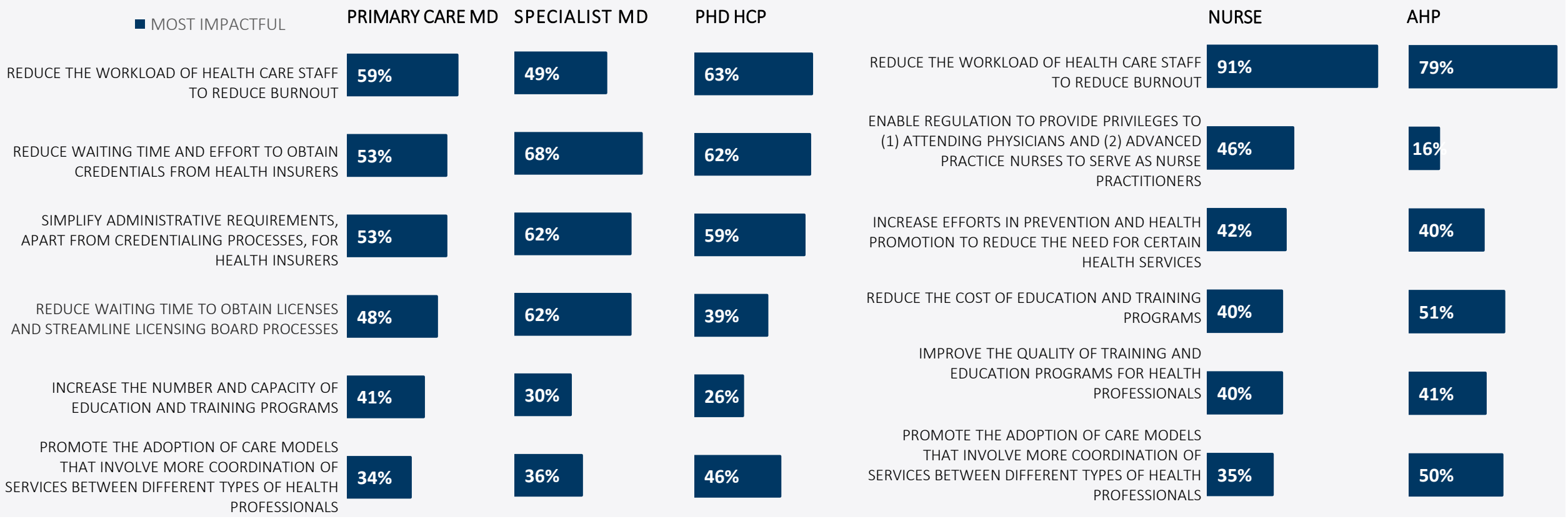
BELIEVE THAT CREATING INCENTIVES FOR PHYSICIANS AND OTHER HEALTH CARE PROFESSIONALS COULD HAVE THE MOST POSITIVE IMPACT ON KEEPING THEM IN PUERTO RICO.

Q35. En su opinión, ¿cuáles son las cinco (5) prioridades que los líderes del gobierno de Puerto Rico deberían abordar que tendrían el mayor impacto positivo en el sector de salud de Puerto Rico?

Reducing workload and burnout is seen as a top solution – especially among nurses and allied health. Physicians and PhD HCPs want to see faster turnaround from insurers

Specialists physicians are especially interested in reducing wait times to get credentials both from insurers and licensing boards.
Physicians think reducing insurer admin requirements would be impactful, while nurses and allied health suggest reducing training costs.

MOST IMPACTFUL SOLUTIONS OUTSIDE OF BETTER PAY AND BENEFITS



Q79: A continuación encontrará una lista de posibles cambios que podrían impactar la oferta y disponibilidad de la fuerza laboral en el sector de la salud en Puerto Rico, aparte de cambios en remuneración y beneficios. En su opinión, de la lista proporcionada, ¿cuáles son los cinco (5) cambios que tendrían el mayor impacto positivo en la escasez de personal del sector de la salud?

Open end suggestions to address workforce shortages reveals that most believe that better pay – either through increased salaries, incentives, or lower taxes – will have the biggest impact

Other suggestions include improved technology, better working conditions, more focus on prevention, and reduced workload.

INITATIVES THAT WOULD HAVE GREATEST IMPACT TO REDUCE SHORTAGES IN HEALTH CARE WORKFORCE [OPEN ENDED]

1	*"ACCREDITATION OF LICENSES OF HEALTH PROFESSIONALS FROM ELSEWHERE IN PUERTO RICO"*	*"IMPROVE SALARY"*	*"LOWER THE TAX RATE FOR GENERAL PRACTITIONERS"*	*"RETAIN SPECIALIST DOCTORS, ECONOMIC INCENTIVES"*	*"MORE EFFECTIVE AND FASTER CREDENTIALING BY THE GOVERNMENT AND INSURERS"*	*"IMPROVE WORKING CONDITIONS (WORKLOAD, REMUNERATION..., EQUIPMENT, FACILITIES...)"*
2	*"BETTER CONDITIONS OR RENUMERATIONS OF HEALTH CARE PROVIDERS"*	*"REDUCE WORKLOAD"*	*"GIVE INCENTIVES TO GENERAL PRACTITIONERS"*	*"REDUCE DEMANDS (BUREAUCRACY) OF MEDICAL PLANS TO PRESCRIBE THE MEDICINES THAT OUR PATIENTS NEED"*	*"EXPEDITE PAYMENT FOR SERVICES PROVIDED"*	*"INTERDISCIPLINARY WORK THAT INCLUDES ATTENTION TO SOCIAL NEEDS, AND IN THE CASE OF MENTAL HEALTH, THE INTEGRATION OF THE FAMILY INTO TREATMENT"*
3	*"BETTER PROMOTE THE SERVICES OF PROFESSIONALS WITHIN HOSPITALS."*	*"INCREASE EMPLOYEES PER SHIFT"*	*"BETTER TECHNOLOGY AVAILABILITY"*	*"BETTER PAY FROM MEDICAL PLANS TO SPECIALIST DOCTORS"*	*"INCREASE IN RATES FOR SERVICES PROVIDED."*	*"PROGRAMS FOCUSED ON PREVENTION"*

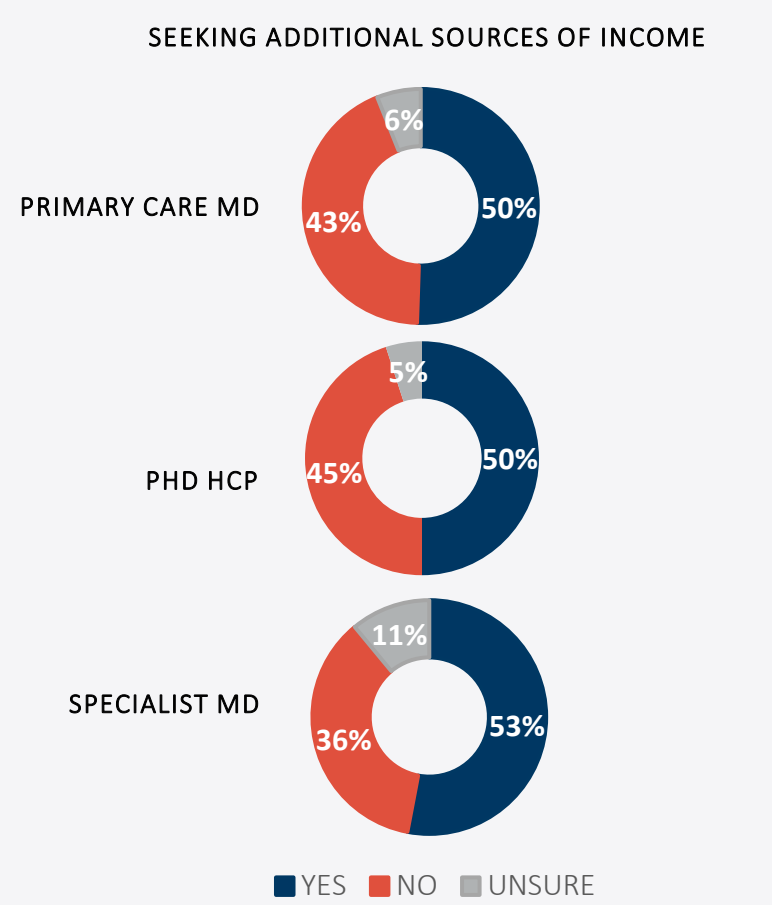
Q97: En su opinión, ¿cuáles son las tres iniciativas que tendrían el mayor impacto en reducir escaseces en la fuerza laboral de salud en Puerto Rico?

Future Employment and Underlying Attitudes

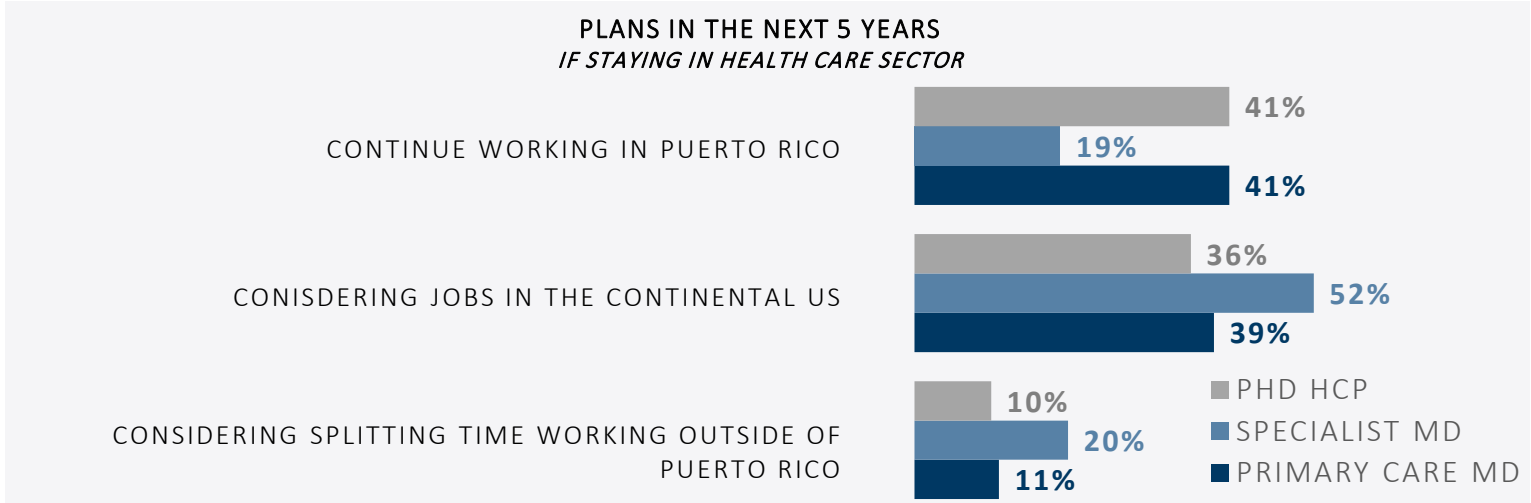
Half of physicians and PhDs say they seek out additional income. Primary care and PhD HCPs are more likely to be seeking out new jobs than specialists. But specialists more likely to leave PR

PhD HCPs are most likely to be looking for new jobs followed by primary care physicians, but the bulk of those seeking new jobs plan to stay in Puerto Rico. Specialists are much more likely to consider jobs in the U.S. or consider splitting time.

PHYSICIAN AND PHD HCP FUTURE EMPLOYMENT



	PRIMARY CARE MD	SPECIALIST MD	PHD HCP
SEEKING NEW JOBS/EMPLOYERS	38%	24%	48%
PLAN TO STAY IN HEALTH CARE SECTOR *IF SEEKING NEW JOB*	74%	70%	67%
PLAN TO LEAVE HEALTH CARE SECTOR *IF SEEKING NEW JOB*	17%	15%	20%

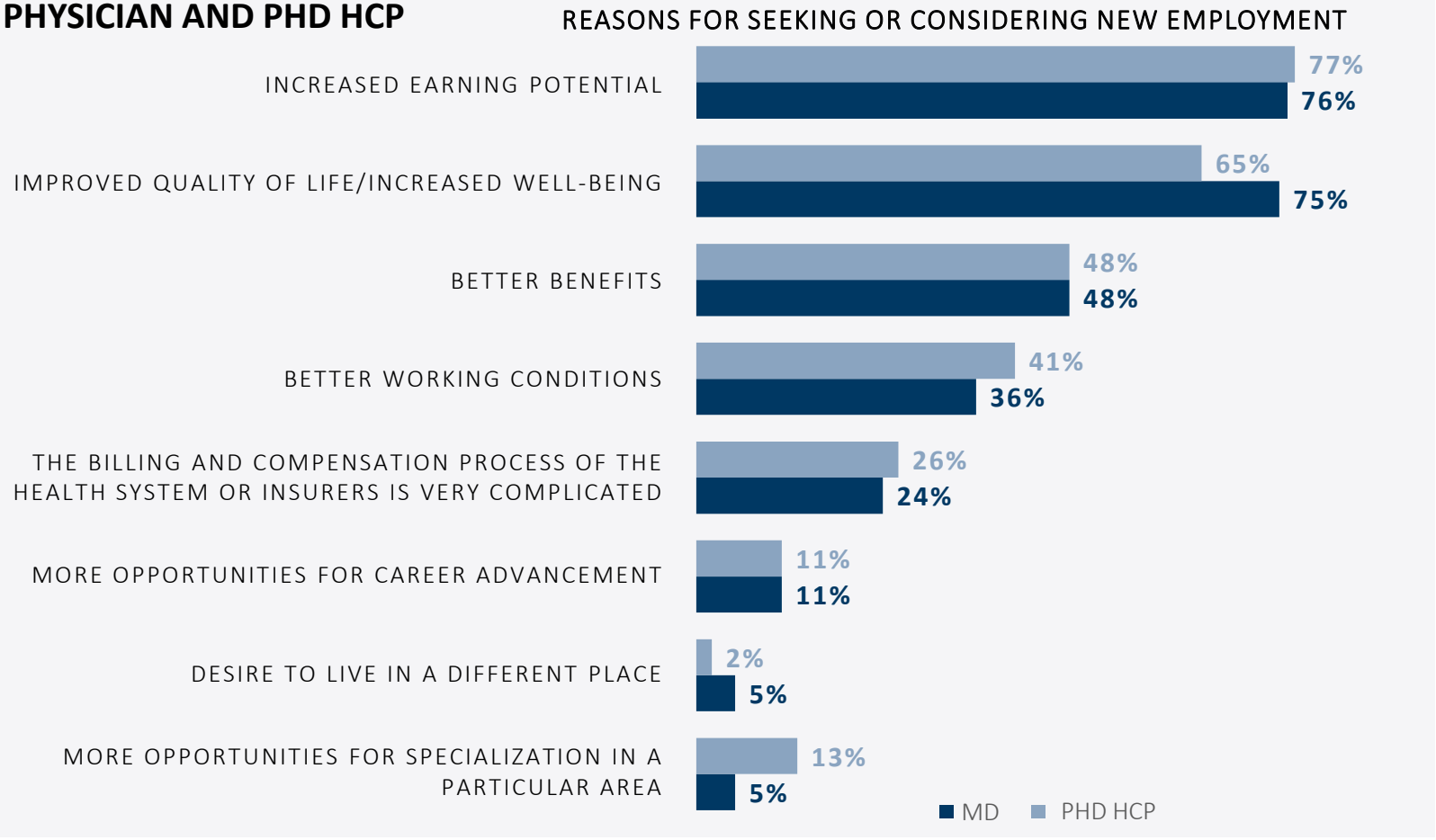


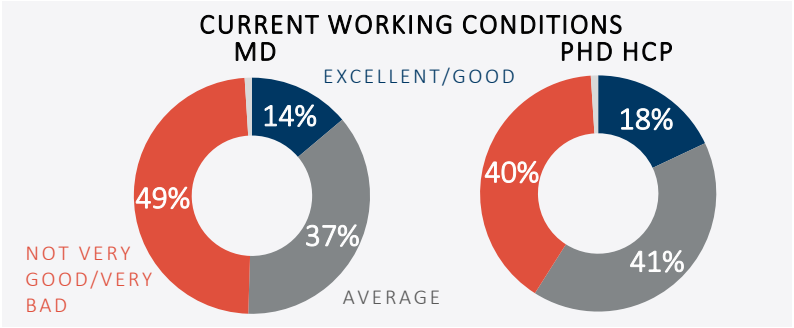
Q54/Q55: ¿Está buscando actualmente otras fuentes de ingresos fuera de su especialidad médica? | Q75: ¿Está buscando o pensando buscar nuevas oportunidades de empleo con otros patronos? | Q76: Mirando hacia a los próximos 5 años, ¿piensa seguir en el sector de salud o trabajar en un sector diferente? | Q77: Mirando hacia a los próximos 5 años, ¿piensa continuar trabajando en Puerto Rico o está considerando oportunidades de trabajo fuera de Puerto Rico?

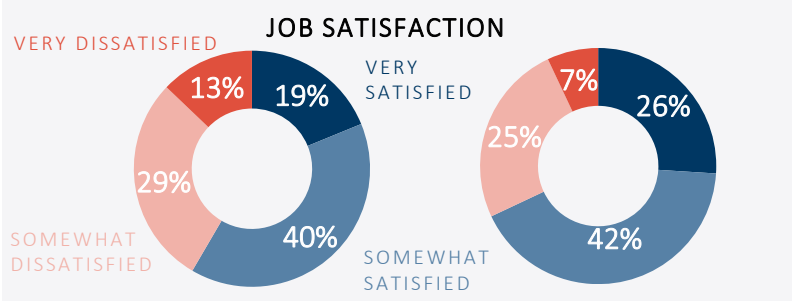
Few Physicians or PhDs rate their working conditions positively, but they do have high levels of job satisfaction. Better pay and quality of life drive new job seeking

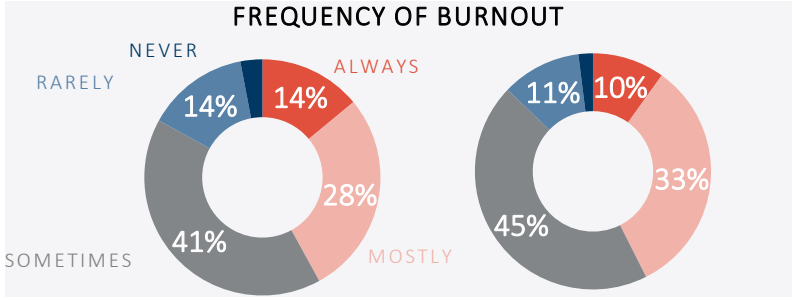
Better benefits and working conditions also rank as high Physicians and PhDs seeking new employment, but it is secondary to wages and quality of life. More than a third of physicians and PhD HCPs are regularly experiencing burnout.

PHYSICIAN AND PHD HCP









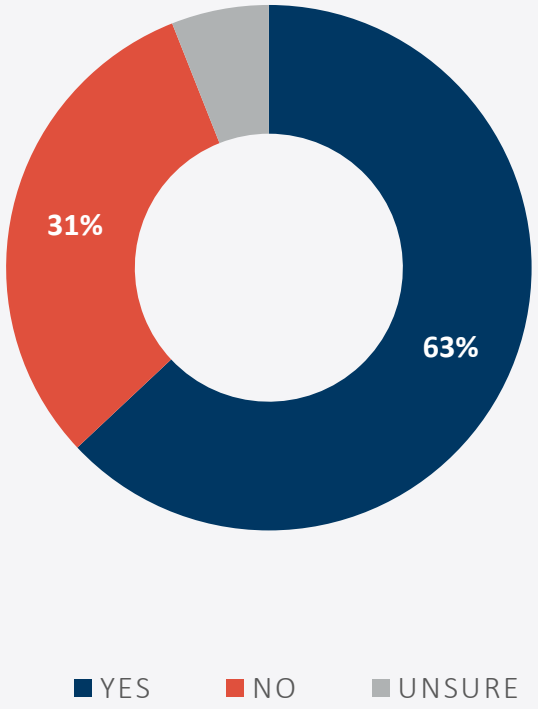
Q67: ¿Cómo calificaría las condiciones de trabajo actuales de los profesionales de la salud en Puerto Rico que operan en su área/campo? | Q68: ¿Cómo calificaría su satisfacción con su trabajo actual en el sector de la salud? | Q70: ¿Con qué frecuencia siente burnout definido como un estado de desgaste, agotamiento emocional, despersonalización y una sensación reducida de realización personal? | Q78: ¿Cuáles son las tres (3) razones principales por las que está buscando o considerando un nuevo empleo?

Nearly two thirds of nurses are seeking additional income, and new jobs. Nurses are much less likely to commit to staying in health care.

Nearly two thirds of nurses are seeking additional sources of income outside their HEALTH CARE profession, and nearly two thirds report seeking new employment. Many who are looking for new health care jobs are looking outside of Puerto Rico.

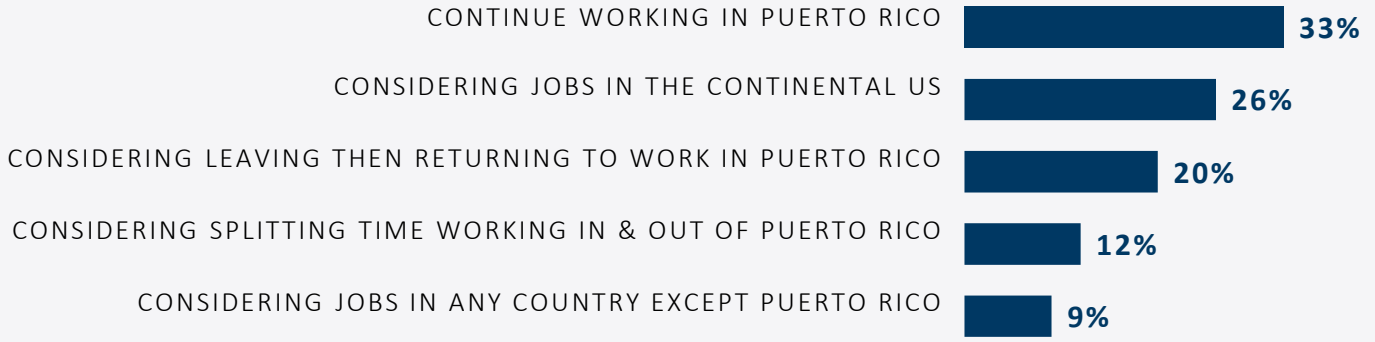
NURSE FUTURE EMPLOYMENT

SEEKING ADDITIONAL SOURCES OF INCOME



	NURSE
SEEKING NEW JOBS/EMPLOYERS	62%
PLAN TO STAY IN HEALTH CARE SECTOR *IF SEEKING NEW JOB*	42%
PLAN TO LEAVE HEALTH CARE SECTOR *IF SEEKING NEW JOB*	41%

PLANS IN THE NEXT 5 YEARS
IF STAYING IN HEALTH CARE SECTOR



Q55:¿Está buscando actualmente otras fuentes de ingresos fuera de su profesión de la salud?| Q75: ¿Está buscando o pensando buscar nuevas oportunidades de empleo con otros patronos? | Q76: Mirando hacia a los próximos 5 años, ¿piensa seguir en el sector de salud o trabajar en un sector diferente? | Q77: Mirando hacia a los próximos 5 años, ¿piensa continuar trabajando en Puerto Rico o está considerando oportunidades de trabajo fuera de Puerto Rico?

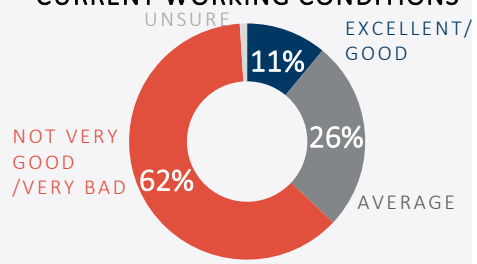
Nurses report worse working conditions and much higher burnout than physicians and PhDs. Both of which are key drivers – in addition to pay – for their job seeking

While pay ranks as the most important issue for nurses seeking new employment, quality of life, working conditions, and better benefits are vying closely as top tier priorities. This aligns with the fact that nearly two thirds rate their working conditions poorly.

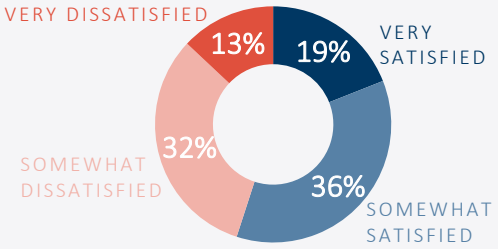
NURSE

TOP REASONS FOR SEEKING OR CONSIDERING NEW EMPLOYMENT

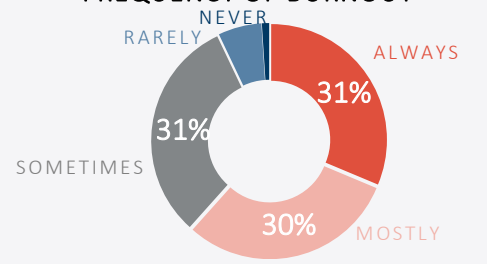
CURRENT WORKING CONDITIONS



JOB SATISFACTION



FREQUENCY OF BURNOUT



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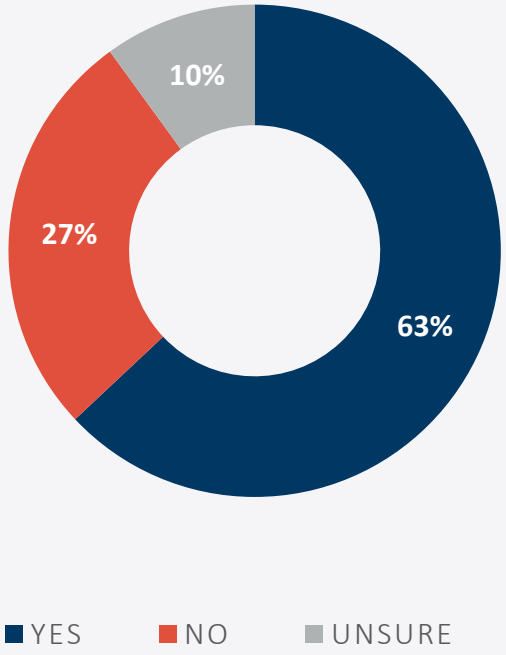
Nearly two thirds of allied health are seeking additional sources of income, with nearly half report seeking new employment. Of those seeking new employment, many plan to exit health care

More than a third of allied health professionals are seeking employment outside the HEALTH CARE sector, creating real drop off risk, similar to nurses. Encouragingly, more than three quarters of those seeking new jobs in the HEALTH CARE sector plan to stay in Puerto Rico.

ALLIED HEALTH FUTURE EMPLOYMENT

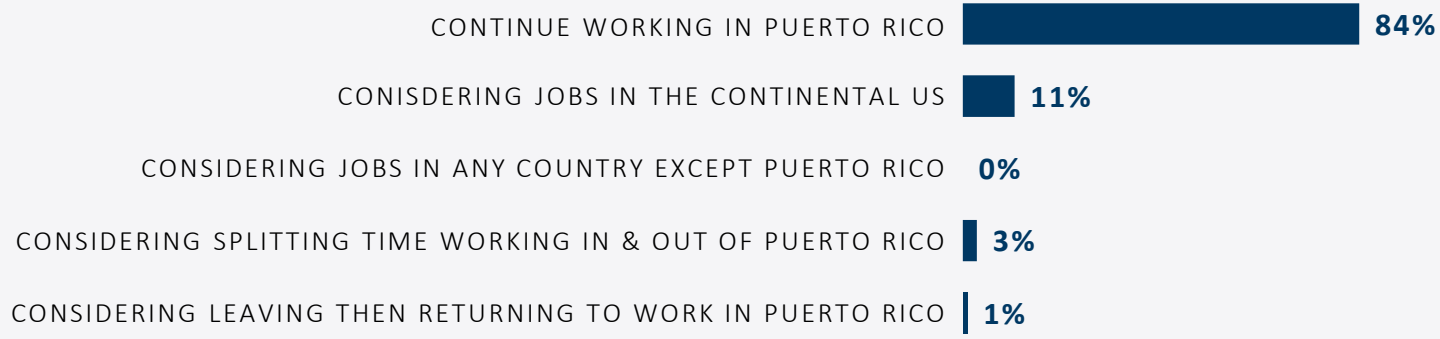
SEEKING ADDITIONAL SOURCES OF INCOME



ALLIED HEALTH PROFESSIONAL

SEEKING NEW JOBS/EMPLOYERS	47%
PLAN TO STAY IN HEALTH CARE SECTOR *IF SEEKING NEW JOB*	48%
PLAN TO LEAVE HEALTH CARE SECTOR *IF SEEKING NEW JOB*	38%

PLANS IN THE NEXT 5 YEARS
IF STAYING IN HEALTH CARE SECTOR



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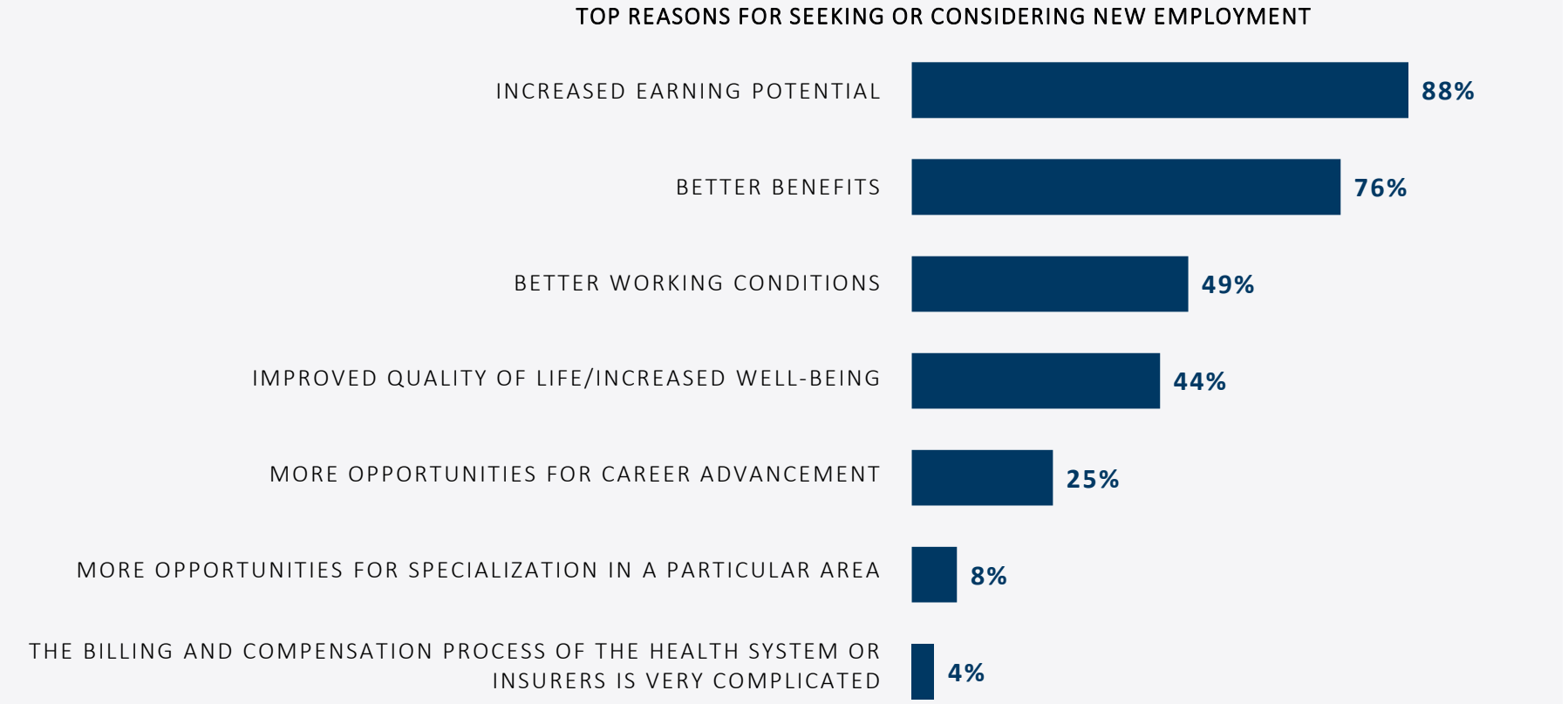
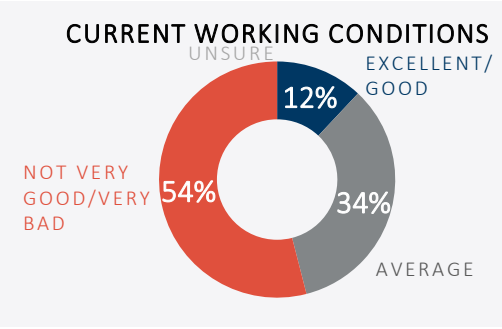
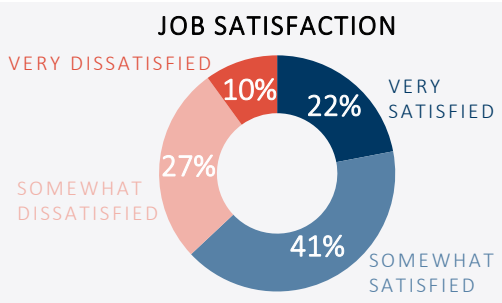
Allied health have considerably high job satisfaction, but most rate their working conditions negatively, and half admit they experience burnout regularly. Pay and benefits drive job seeking.

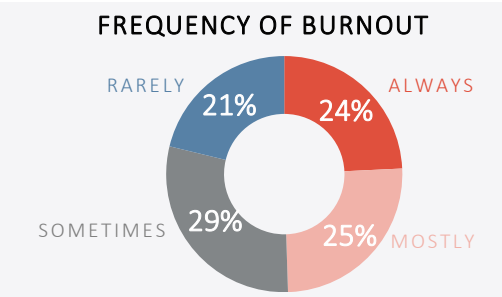
While better working conditions and improved quality of life to rank as a high priority, it falls far below better salary and benefits for those seeking new employment.

ALLIED HEALTH PROFESSIONAL









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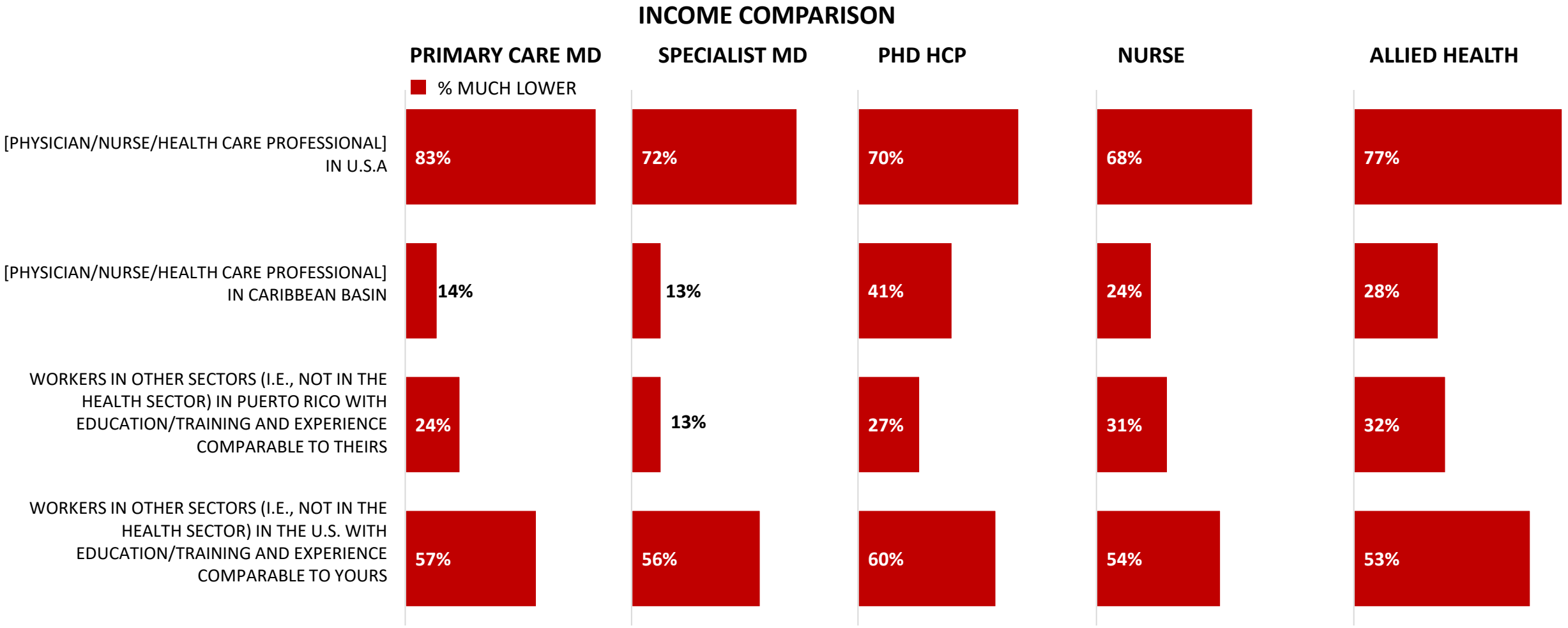
Across audiences – a clear majority believe that they are paid much less than their counterparts in the United States, including than other individuals in other sectors with similar training.

Many PhD HCPs believe that they are making much less than their counterparts in the Caribbean, while nearly a third of nurses and allied health believe they are making much less than workers in other sectors in Puerto Rico.

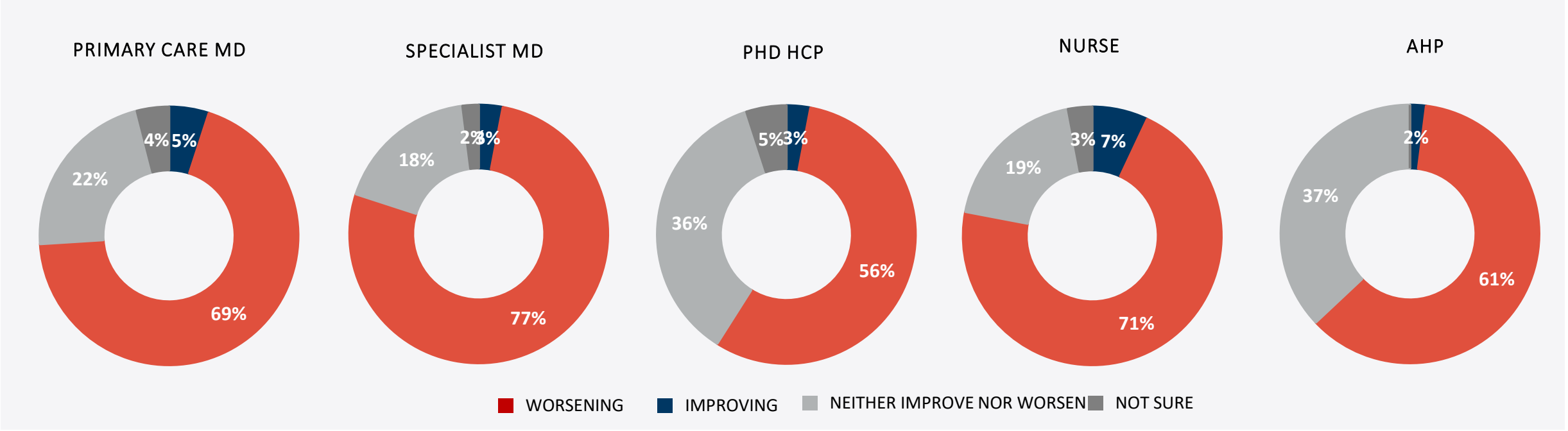


Q71. A su entender, indique cómo su remuneración (ingreso) total como profesional de la salud en Puerto Rico se compara con otras localizaciones y sectores:

Across each audience, most are pessimistic about future working conditions, especially specialist physicians.

Open ends indicate this pessimism is driven by low wages, patient overload, and burnout.

WORKING CONDITIONS IN NEXT TWO YEARS



"THERE IS NOT ENOUGH STAFF TO MEET THE NEEDS OF PATIENTS. THIS OVERLOADS STAFF, WHICH HAS AN IMPACT ON OUR HEALTH, PERFORMANCE AND THE QUALITY OF SERVICES WE OFFER. FAILURE TO PAY ON TIME LIMITS US IN THE COST OF OPERATIONS. ULTIMATELY AFFECTING THE SERVICE OFFERED"

"THE RATES THEY PAY US ARE REDUCED AND EVERYTHING GOES UP: WATER, ELECTRICITY, EMPLOYEE SALARIES, DENTAL MATERIALS, AVAILABLE TECHNOLOGY AND MY RATES ARE VERY LOW. WE HAVE TO SACRIFICE VOLUME OF PATIENTS TO HAVE ENOUGH INCOME TO SURVIVE."

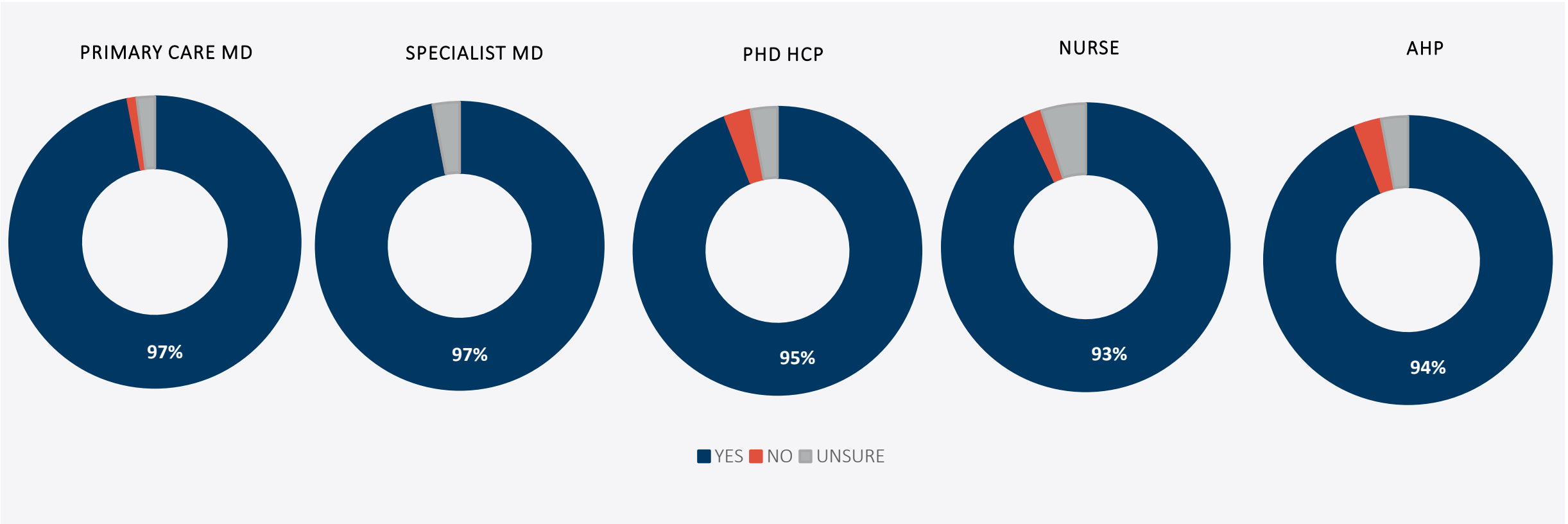
"THE LACK OF PERSONNEL CAUSES BURNOUT TO INCREASE, THEREFORE, SERVICES ARE AFFECTED. THE LACK OF SPECIALISTS ON THE ISLAND AFFECTS THE POPULATION. THE BIGGEST PROBLEM IS THE HEALTH INSURANCE COMPANIES ON THE ISLAND, THEY MAKE IT IMPOSSIBLE TO PROPERLY MANAGE HEALTH"

Q69: ¿Cree que las condiciones de trabajo van a mejorar o empeorar para el personal del sector de la salud en los próximos dos años?

Licensing

Nearly all health care workers plan to renew their professional health care license

Allied health and nurses are slightly less likely to commit to renewing their license.



Q44. ¿Tiene previsto renovar su licencia de profesional de la salud?

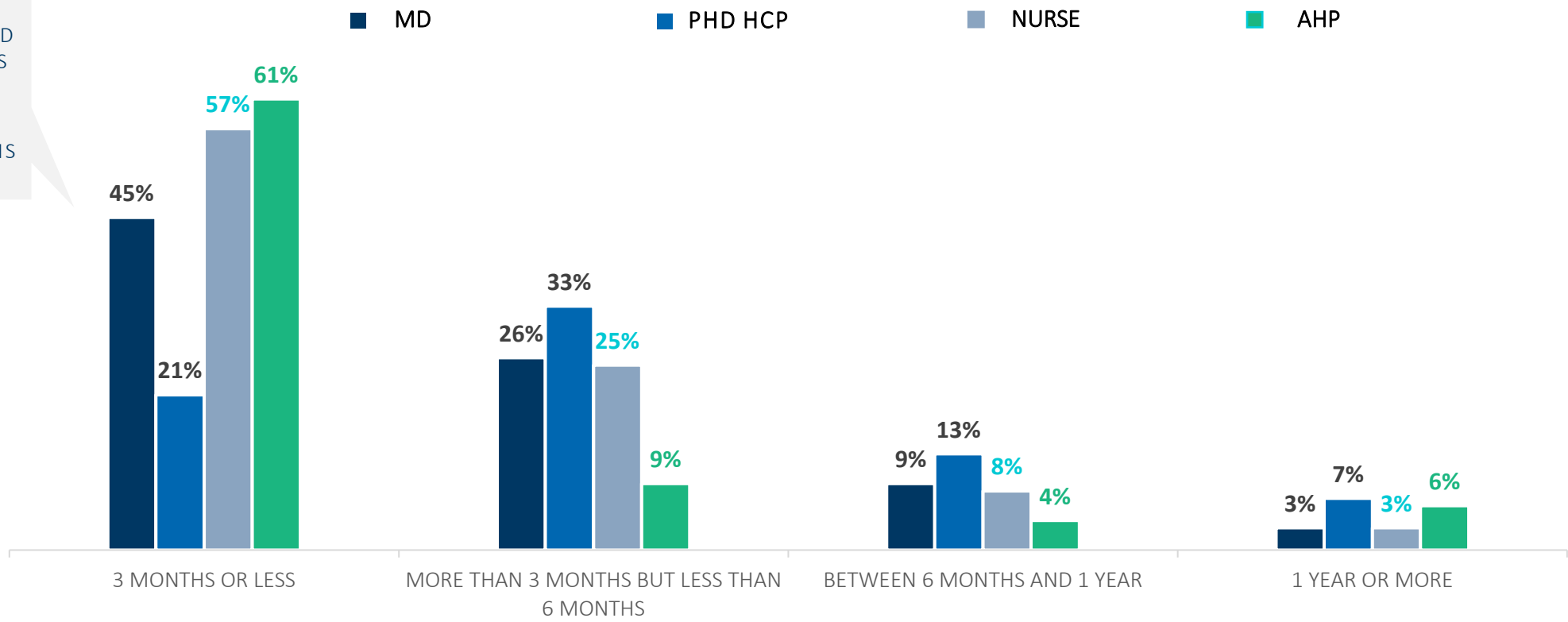
Allied health and nurses report the quickest turnaround from Licensing and Examination Board, while MDs and especially PhDs report longer wait times to get licensed

Primary care physicians report a much quicker turnaround for their licensing than specialists

LENGTH OF TIME TO GET PROFESSIONAL MEDICAL LICENSE FROM LICENSING AND EXAMINATION BOARD

55% PRIMARY CARE PROVIDERS WAITED 3 MONTHS OF LESS

28% SPECIALISTS WAITED 3 MONTHS OR LESS

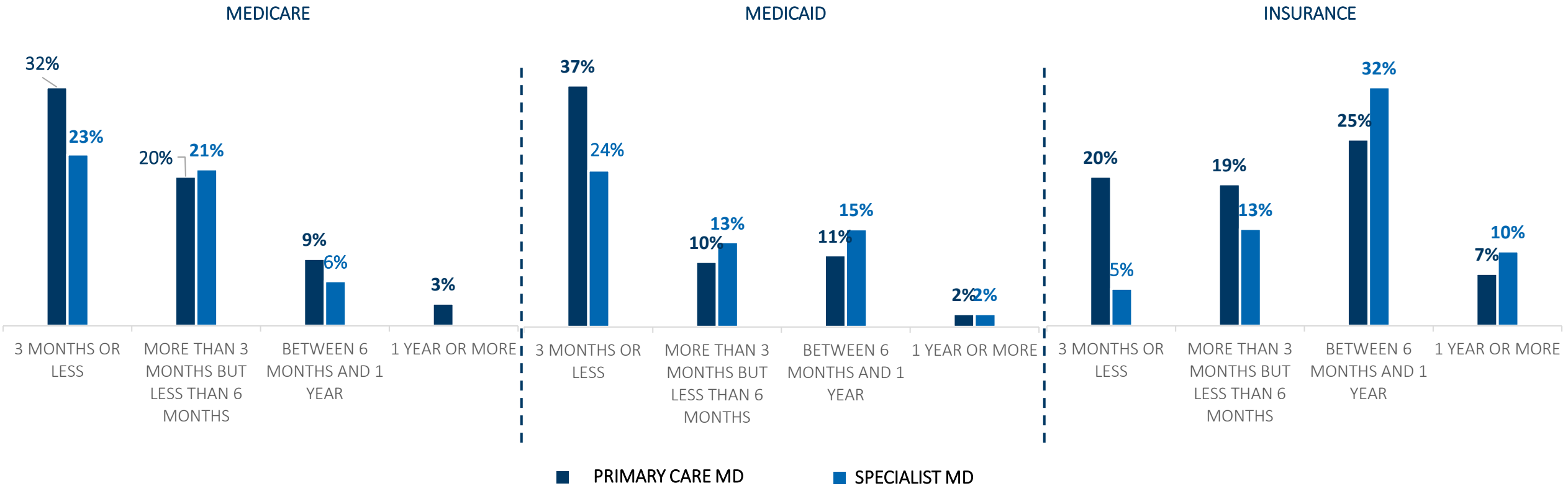


Q40. ¿Cuánto tardó en recibir su licencia de proveedor de su Junta de Licenciamiento o Junta Examinadora de Profesionales de la Salud en Puerto Rico la primera vez que la recibió?

Physicians report that insurers are the slowest to provide credentials, while the bulk indicate that they get their credentials from Medicare and Medicaid in less than 6 months

Nearly a third of specialist physicians and quarter of primary care physicians report that it takes between 6 months to a year to get their identification number from insurers. Primary care physicians are more likely to get credentialed quicker than specialists.

LENGTH OF TIME TO GET CREDENTIALED FROM MEDICARE, MEDICAID, AND INSURERS



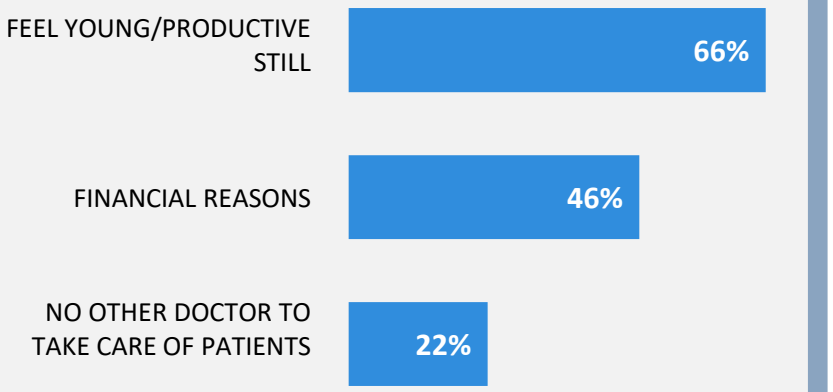
Q41. Si está credencializado para el programa de Medicare para practicar a Puerto Rico, ¿cuánto tardó en promedio en recibir la credencialización oficial de First Coast? | Q42. Si está registrado para el programa de Medicaid de Puerto Rico (¨Plan VITAL¨), ¿cuánto tardó en inscribirse a través del Portal de Inscripción de Proveedores (PEP)? | Q43 Si está credencializado por aseguradoras de salud que operan en Puerto Rico, ¿en promedio cuánto tardó en recibir la credencialización oficial de esas organizaciones?

Most physicians 60 or older plan to retire in the next 5 years, with the rest planning to wait it out, due mostly to their belief that they are still up for the job.

Older specialists are much more likely to retire in the next 5 years than primary care physicians.

REASON FOR NOT RETIRING IN 5 YEARS

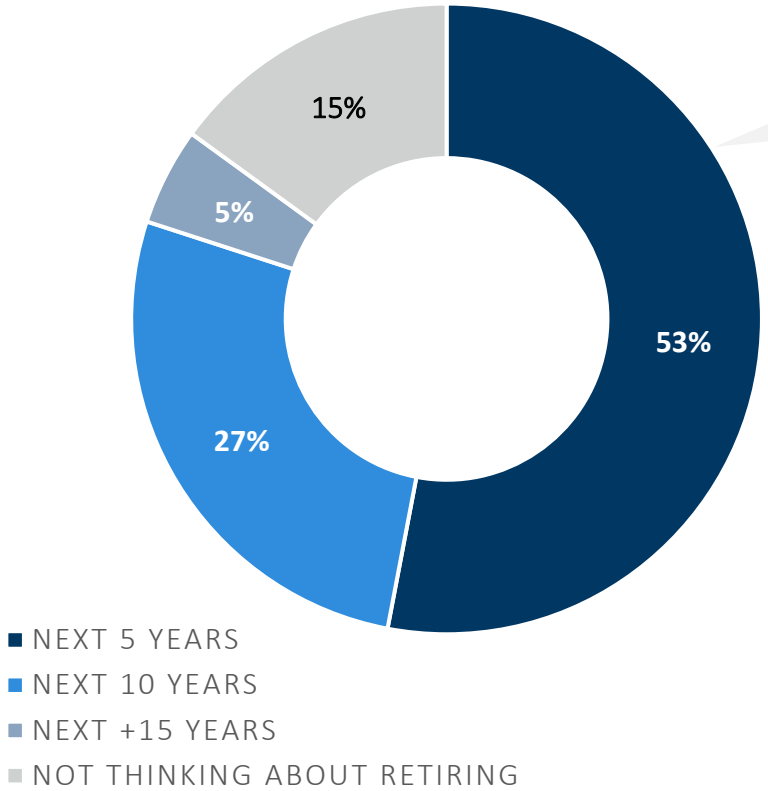
AMONG MDs WHO DON'T PLAN ON RETIRING IN NEXT 5 YEARS



YEARS TO RETIREMENT

MD OVER 60

(33% OF ALL PHYSICIANS)



49% PRIMARY CARE MD
66% SPECIALIST MD

76% OF NURSES* OVER 60 YEARS PLAN TO RETIRE IN THE NEXT 5 YEARS

**SMALL SAMPLE SIZE, RESULTS ARE DIRECTIONAL*

Q46. ¿En cuantos años planea retirarse? | Q47. ¿Por qué no tiene planeado retirarse en los próximos 5 años?

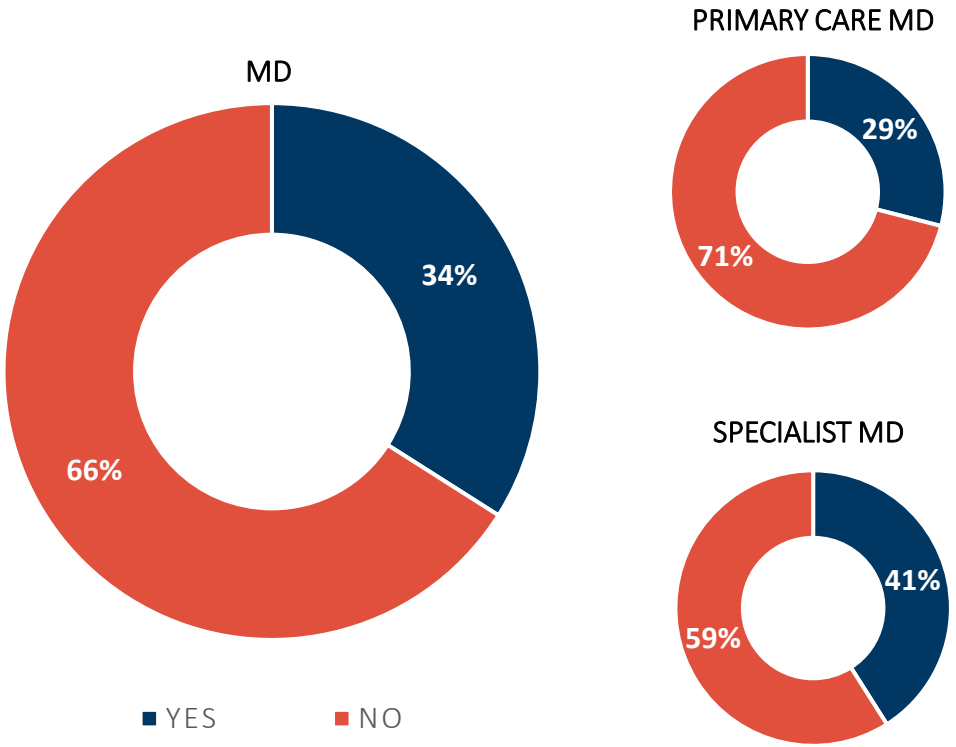
Payments and Patient Access

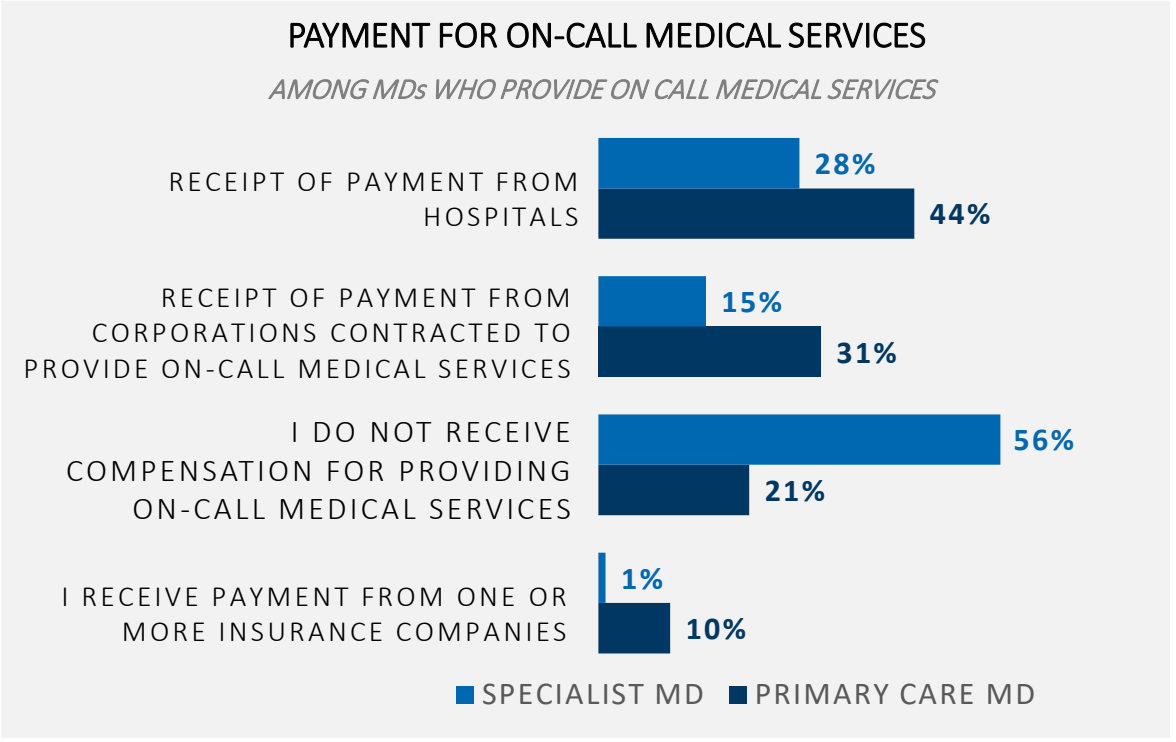
(AMONG MDs ONLY)

Only a third of physicians provide on-call medical services in a hospital, with specialists being more likely to provide them than primary care.

While most primary care physicians who provide on-call services indicate they get paid by the hospital or a corporation who contracted the service, more than half of specialists indicate they don't get compensation for their on-call medical services.

ACCESS AND PAYMENT FOR ON-CALL MEDICAL SERVICES AT A HOSPITAL



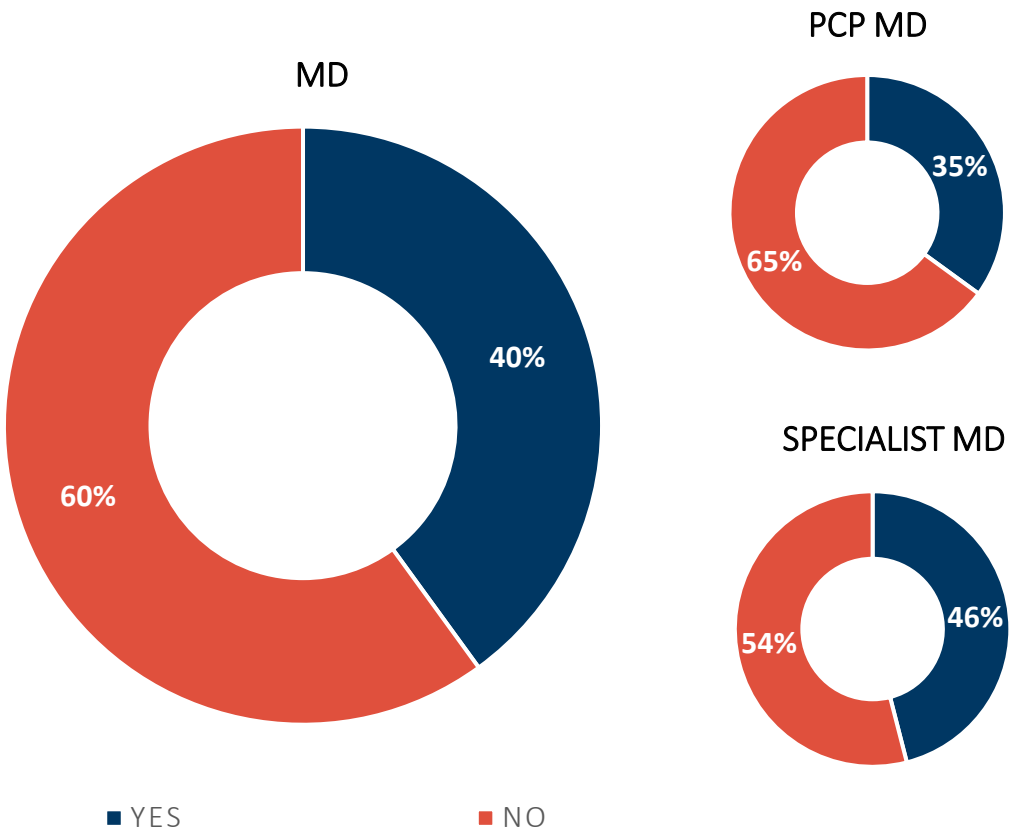


Q48. ¿Actualmente proporciona servicios médicos de guardia en un hospital? | Q49 ¿Cómo es compensado por su disponibilidad para esas guardias?| Q50. ¿Tiene privilegios para admitir pacientes en por lo menos un hospital?

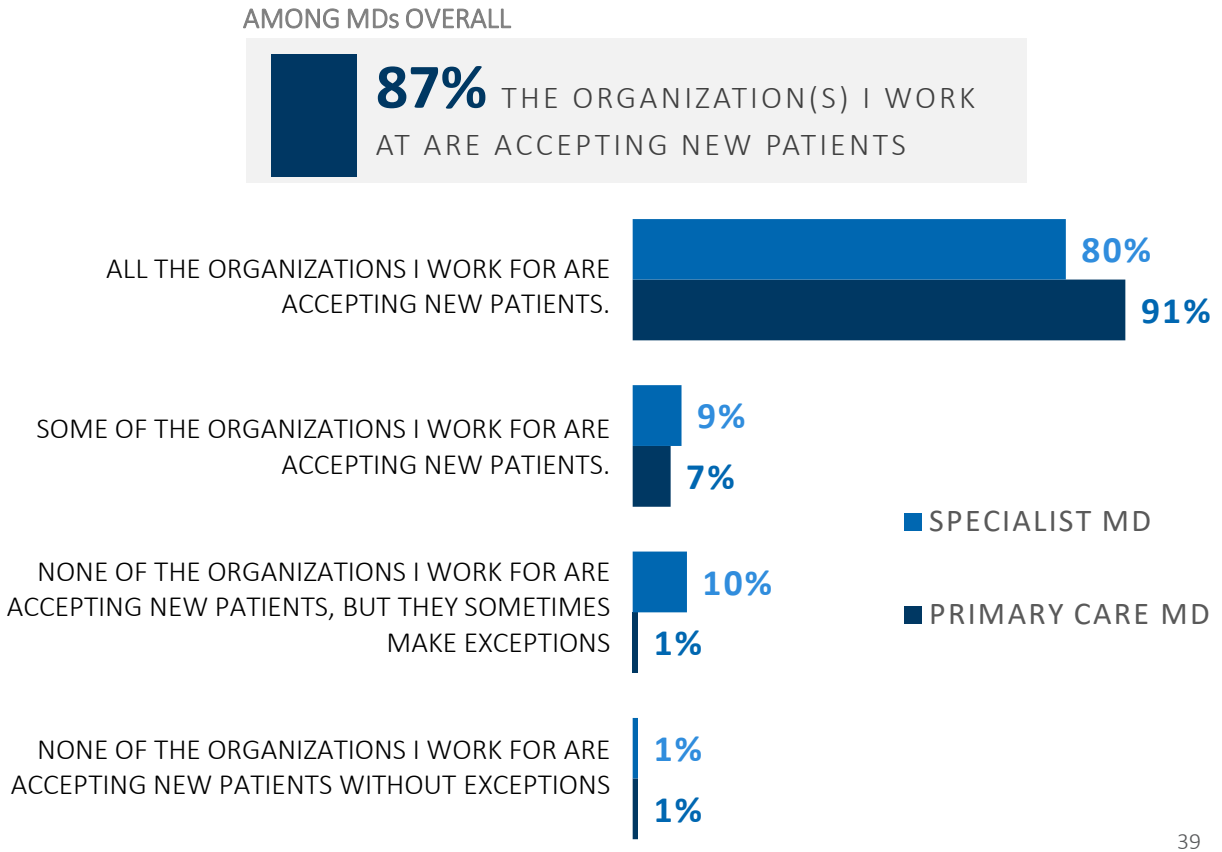
The vast majority MDs say their organization is accepting new patients, but most are unlikely to have admitting privileges at hospital

Specialist MDs are more likely to have admitting privileges than Primary Care Physicians but are also slightly less likely to say that ALL their organizations are accepting new patients, though most do.

ADMITTING PRIVILEGES AT A HOSPITAL



ORGANIZATION ACCEPTING NEW PATIENTS

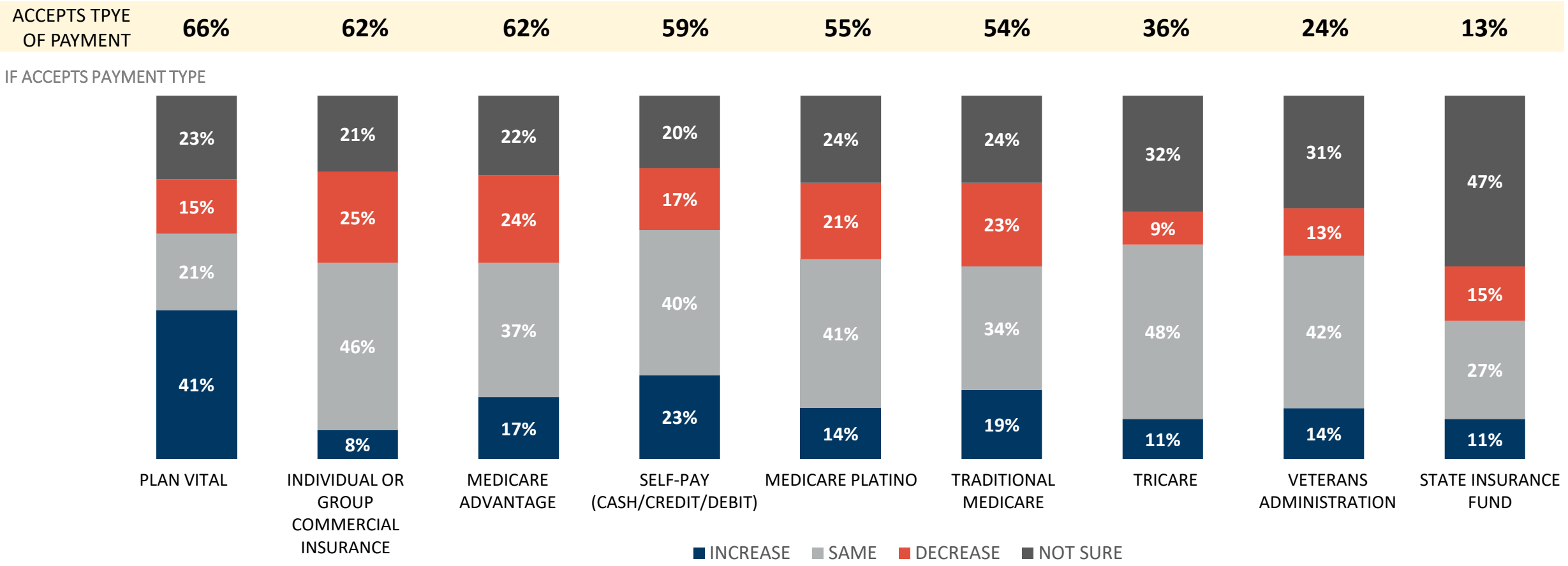


Q50. ¿Tiene privilegios para admitir pacientes en por lo menos un hospital? | Q51. Pensando en las oficinas, grupos médicos y/o organizaciones de atención médica en las que trabaja actualmente, ¿están aceptando nuevos pacientes?

Physicians report the biggest increases in use of Plan Vital and self-pay among their patients, both of which are widely accepted

Physicians are more likely to report payments from Medicare (Advantage, Traditional, and Platino) decreasing than increasing, along with commercial insurances, though the plurality say that there has been no change.

ACCEPTED METHODS OF PAYMENT AND CHANGE IN PAYMENT RATES

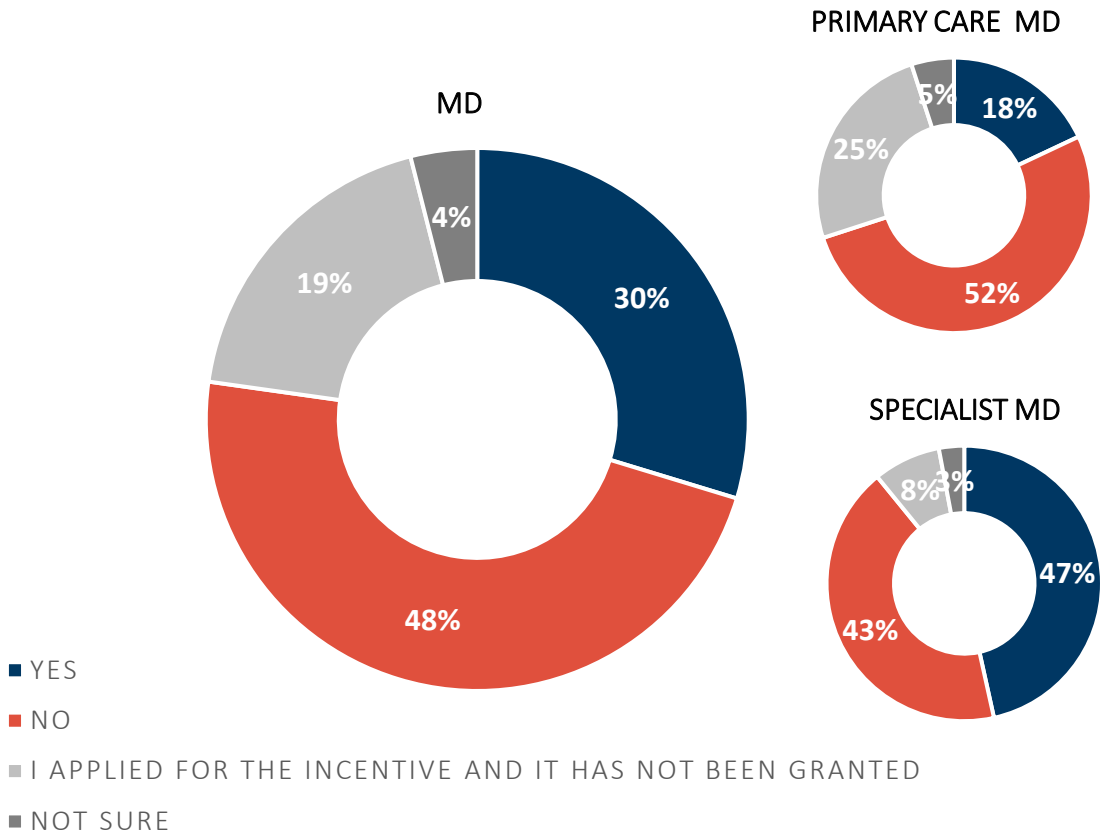


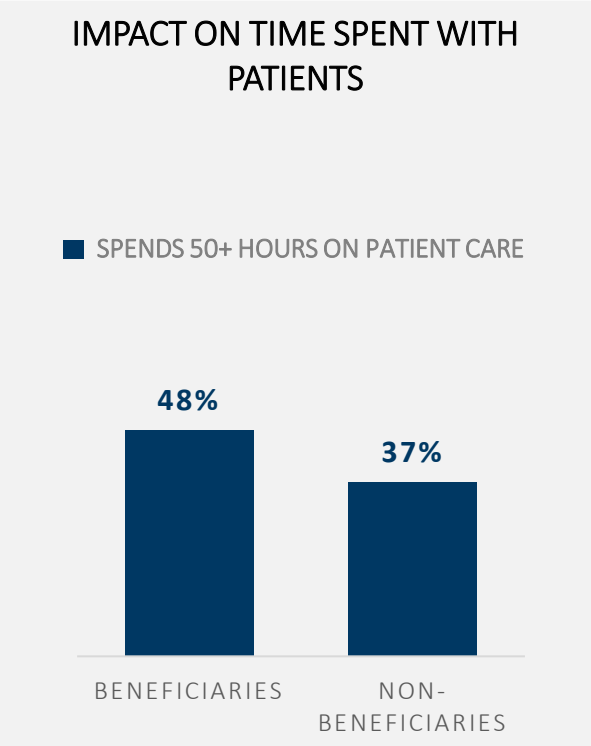
Q52. De los siguientes pagadores/formas de pago, ¿cuáles aplican a las organizaciones con las que trabaja? | Q53. Para cada uno de los pagadores/formas de pago que seleccionó en la pregunta anterior, indique si ha experimentado aumentos o disminuciones en las tarifas de pago

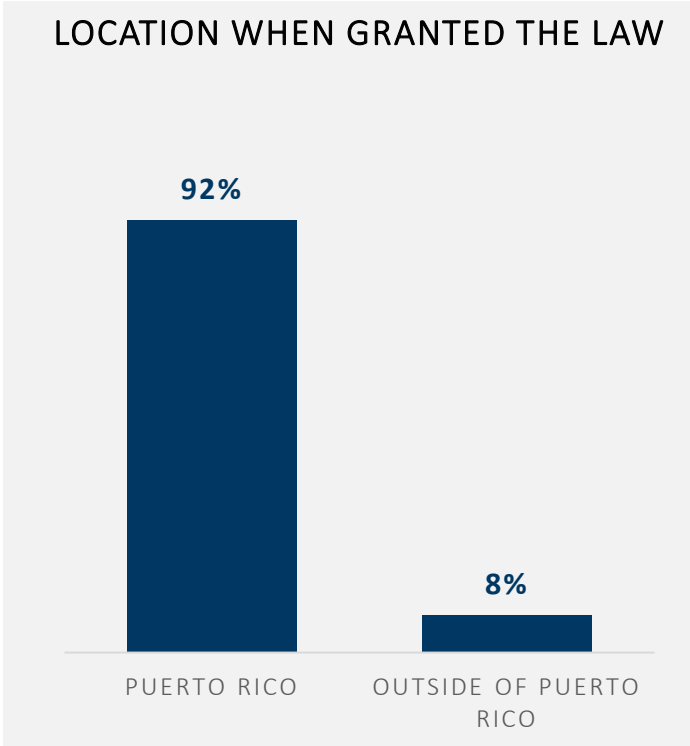
Most physicians indicate they are not beneficiaries of Law 14, especially primary care physicians. Nearly all were in Puerto Rico when they were granted.

Specialist physicians are more than twice as likely to be beneficiaries of Law 14. Primary care physicians are also more than twice as likely to have applied for the incentive but not have it granted than specialists. Beneficiaries tend to spend more time with patients.

BENEFICIARY OF "LEY NÚMERO 14 DE 21 DE FEBRERO DE 2017"





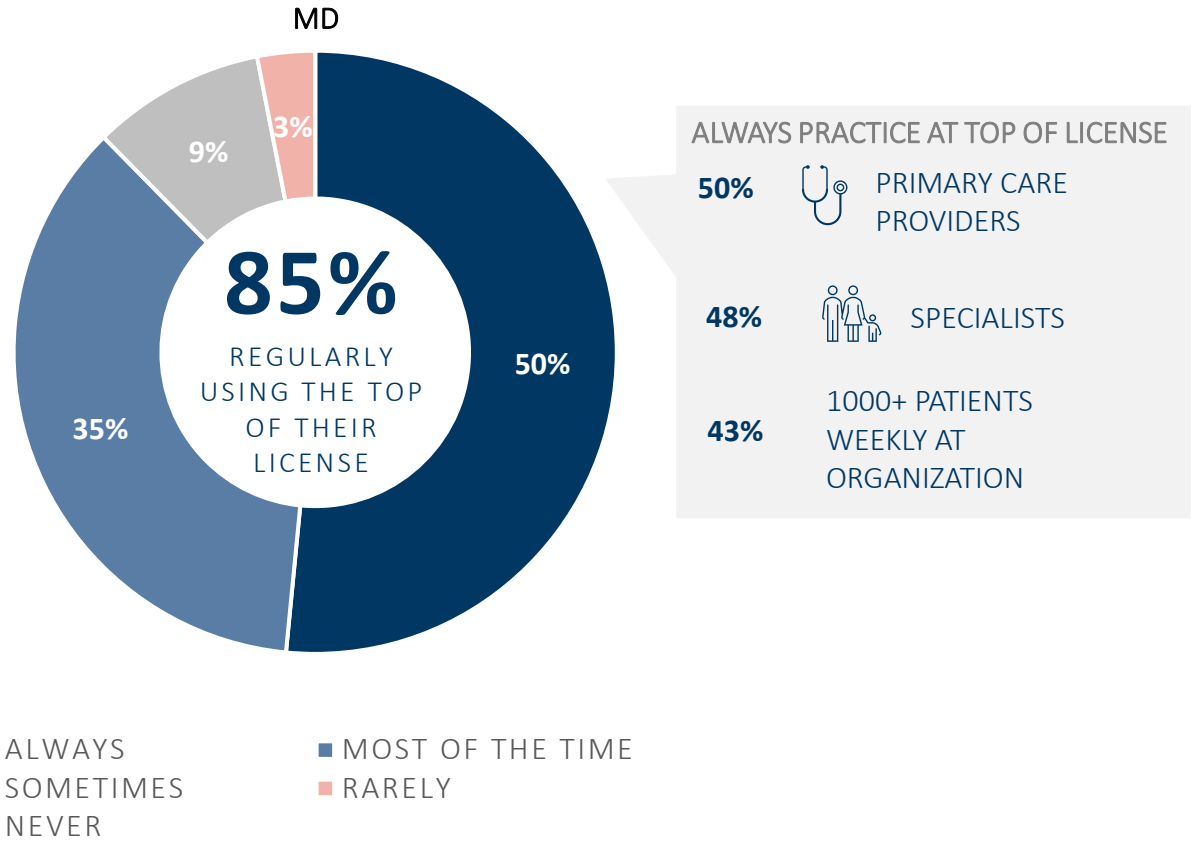


Q58. ¿Usted es beneficiario de la "Ley Número 14 de 21 de febrero de 2017" (el incentivo el 4 porciento) también conocida como la "Ley de Incentivos Para la Retención y Retorno de Profesionales Médicos"? | Q58A. ¿Usted vivía en Puerto Rico o fuera de Puerto Rico antes de que le otorgaran el beneficio de esta ley?

More than three quarters of physicians are regularly working at the top of their license

Taking a deeper look, physicians who work at high volume organizations are less likely to report *always* working at the top of their license.

PRACTICING AT THE TOP OF THEIR LICENSE



ALWAYS PRACTICE AT TOP OF LICENSE

50% PRIMARY CARE PROVIDERS

48% SPECIALISTS

43% 1000+ PATIENTS WEEKLY AT ORGANIZATION

Q60. ¿Con qué frecuencia ejerce ''al máximo de su licencia''? El término ''máximo de licencia'' se refiere a la habilidad del médico de ejercer al máximo nivel de su conocimiento, experiencia, capacitación y aptitud en lugar de dedicar tiempo excesivo a tareas que podrían ser realizadas por personal menos costoso y con menos capacitación.

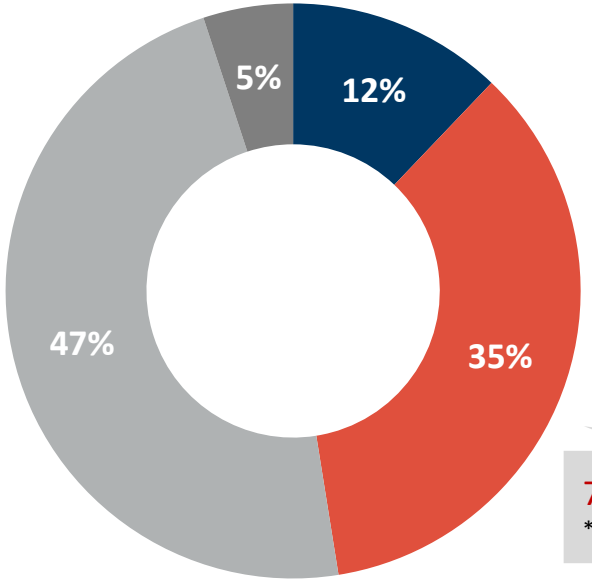
Workforce Demand

(AMONG ADMINISTRATORS ONLY)

Few administrators are optimistic about their future ability to hire and retain health care workers. They also estimate their institutions spend nearly two thirds on labor costs.

Administrators who work at public entities are especially pessimistic about the future of their organizations.

ABILITY TO RECRUIT/RETAIN HEALTH CARE PROFESSIONALS IN NEXT 2 YEARS



73% PUBLIC ENTITIES*

**SMALL SAMPLE SIZE, RESULTS DIRECTIONAL*

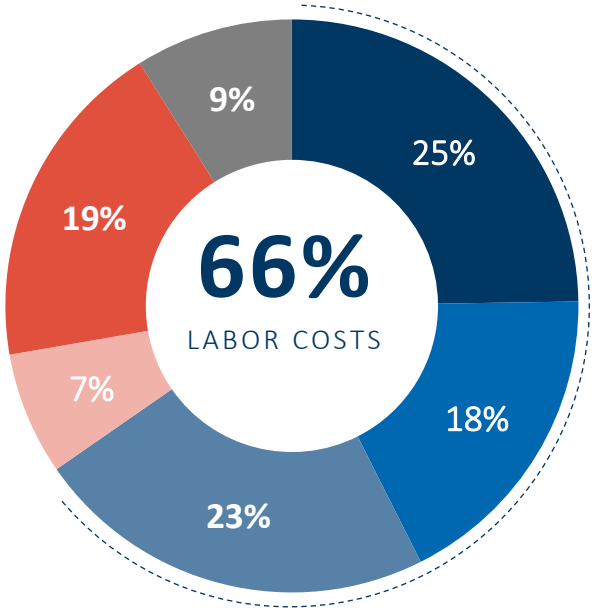
IMPROVING

NEITHER IMPROVING NOR WORSENING

WORSENING

NOT SURE

CURRENT EXPENSE BREAKDOWN



LABOR COSTS (SALARIES AND BENEFITS) OF PHYSICIANS AND (IF APPLICABLE) NURSE PRACTITIONERS AND ASSISTANT PHYSICIANS

NURSING STAFF LABOR COSTS EXCLUDING NURSE PRACTITIONERS PLUS ANCILLARY STAFF LABOR COSTS (E.G., LAB AND RADIOLOGY TECHS, RESPIRATORY THERAPISTS)

LABOR COSTS FOR ADMINISTRATIVE PERSONNEL (E.G., OFFICE MANAGERS, CODING AND BILLING PERSONNEL, DATA ANALYSTS, INFORMATION SYSTEMS SUPPORT, ETC.)

OPERATING EXPENSES INCLUDING MORTGAGE AND/OR RENT OF FACILITIES, MEDICAL EQUIPMENT, MATERIALS AND SUPPLIES, INFORMATION SYSTEMS, UTILITIES - ELECTRICITY, WATER, TELECOMMUNICATIONS, INTERNET, ETC.

MEDICAL MALPRACTICE AND OTHER INSURANCES

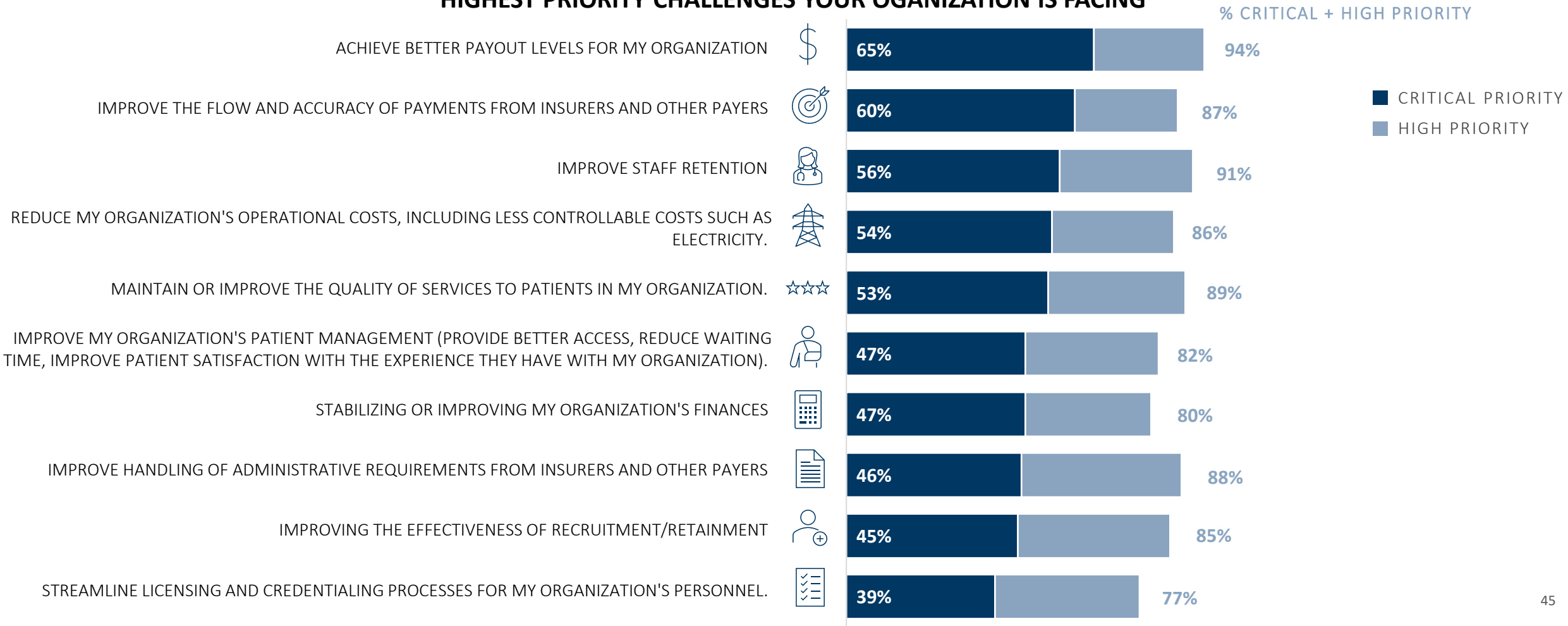
OTHER EXPENSES

Q80. ¿Anticipa que durante los próximos dos años la habilidad de su organización para emplear/contratar y retener profesionales de la salud va a mejorar, empeorar o mantenerse igual?
Q81. Del total de gastos operacionales de su organización, estime cuánto gasta -en términos porcentuales- en las siguientes partidas (si una partida en particular no es aplicable a su organización, introduzca "0").

Financial issues are top of mind for administrators who are focused on better payout levels, improving flow and accuracy of payments and reducing costs

Patient management, stabilizing finances, and improving effectiveness of recruitment/retainment also rank as high priority challenges, but secondary to the top priorities.

HIGHEST PRIORITY CHALLENGES YOUR OGANIZATION IS FACING



Q82. La siguiente es una lista de retos a los que podrían enfrentarse, o ya se enfrentan, organizaciones como la suya. Indique el grado de prioridad de cada uno de estos retos para su organización.

Improving emotional health, and investing in more scholarships and additional support staff for clinical functions – while broadly important – rank lowest among priorities

Measures to improve data management and information systems, invest in personnel development, or improve outcomes are also secondary priorities.

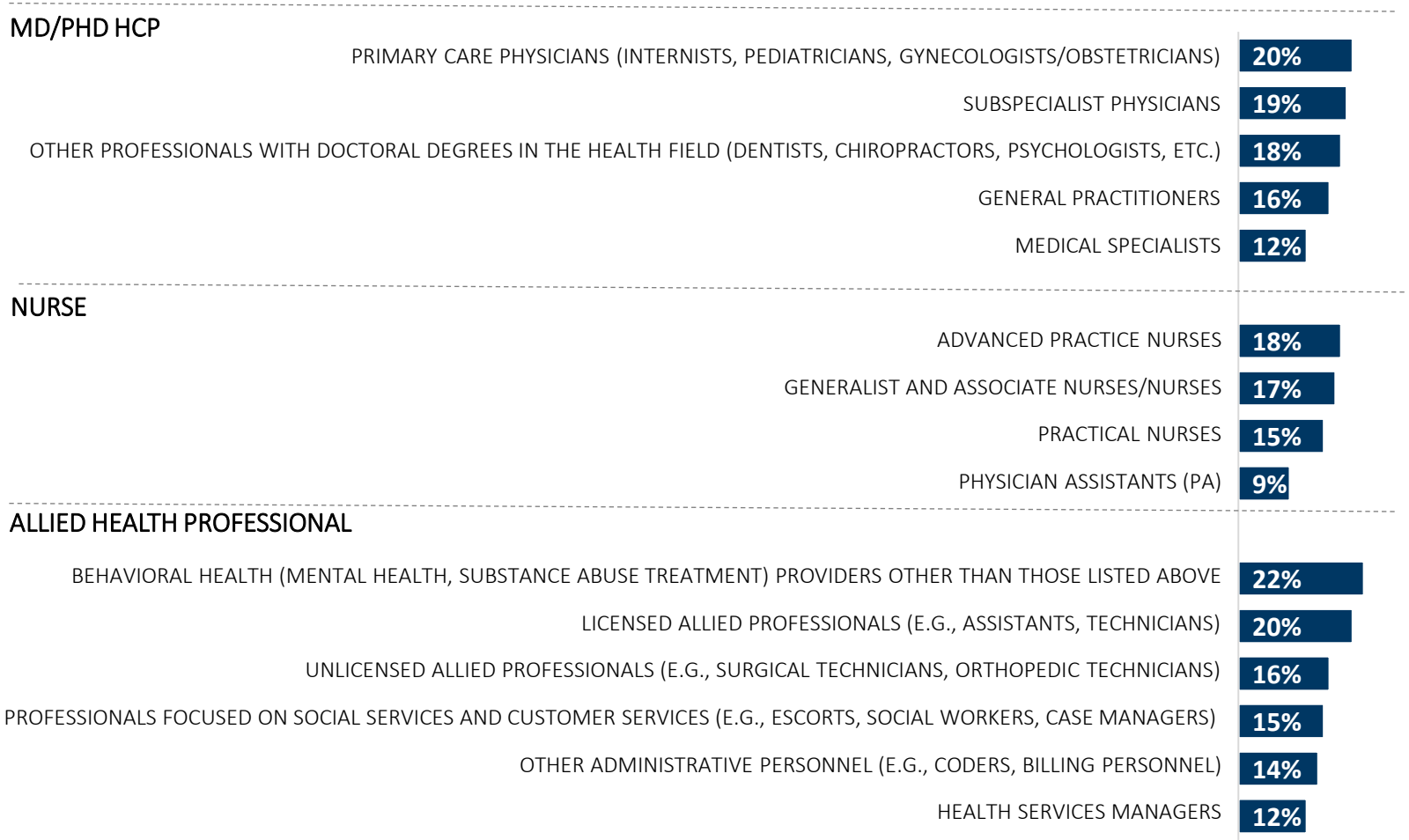
LOWER PRIORITY CHALLENGES FOR YOUR ORGANIZATION

Q82. La siguiente es una lista de retos a los que podrían enfrentarse, o ya se enfrentan, organizaciones como la suya. Indique el grado de prioridad de cada uno de estos retos para su organización.

Administrators anticipate primary care physicians, subspecialists, and behavioral health workers to have highest turnover rates, and say specialists and subspecialists are highest need

Administrators rank generalist nurses as a top need as well – who they expect to lose 18% of in the next 12 months.

EXPECTED TURNOVER IN NEXT 12 MONTHS



GREATEST NEED IN NEXT 2 YEARS

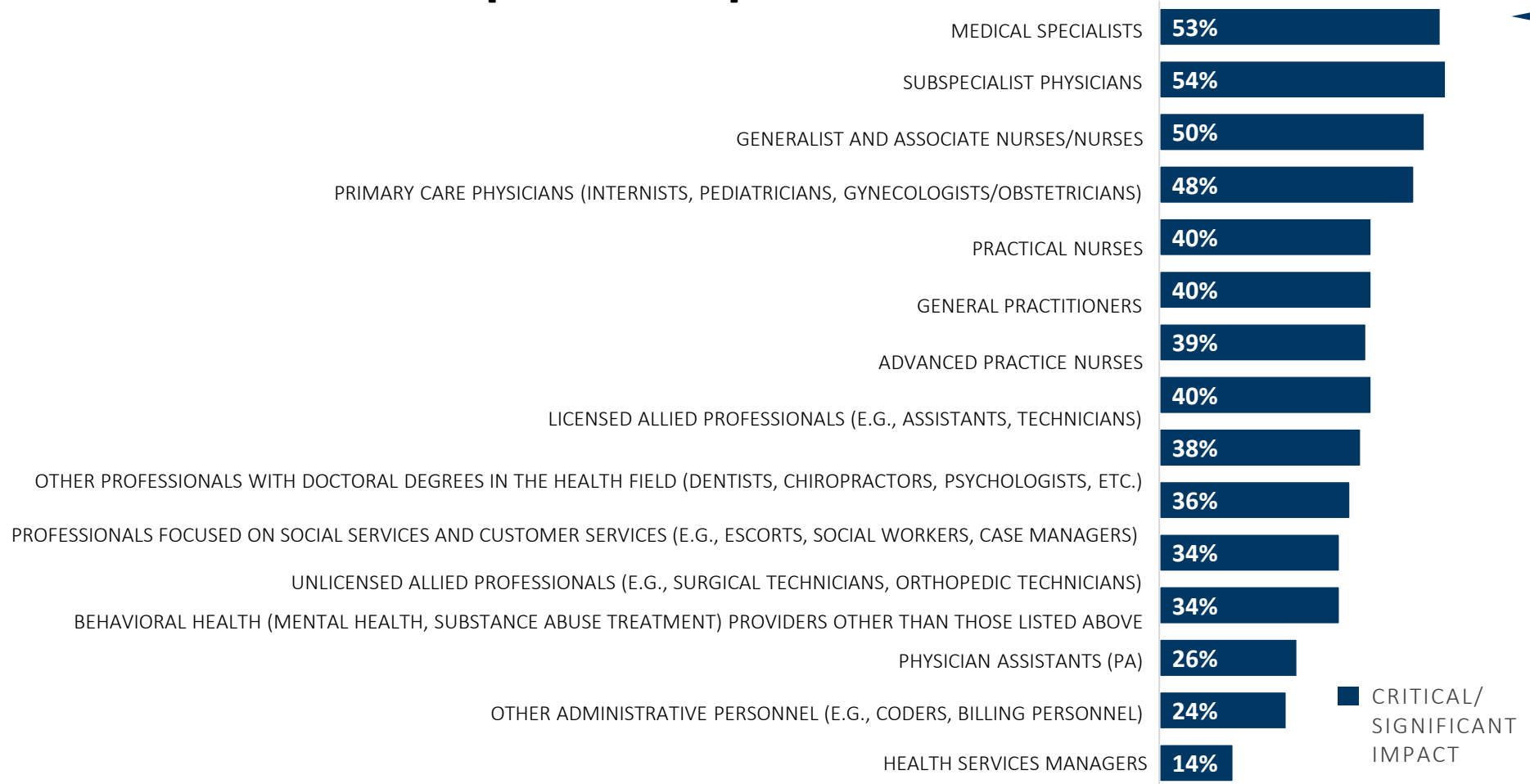
	TOP 5 (% IN TOP 5)	TOP 3 (% IN TOP 3)	
1	67%	55%	MEDICAL SPECIALISTS
2	53%	40%	SUBSPECIALIST PHYSICIANS
3	48%	33%	GENERALIST AND ASSOCIATE NURSES/NURSES
4	47%		GENERAL PRACTITIONERS
5	40%		LICENSED ALLIED PROFESSIONALS (E.G., ASSISTANTS, TECHNICIANS)

Q90. Por favor seleccione y jerarquice en orden descendiente (1 siendo la mayor necesidad) los cinco tipos de profesionales de salud dónde anticipa la mayor necesidad de profesionales de la salud dentro de su organización en los próximos dos años.
Q91. En la siguiente tabla, por favor indique el porcentaje de pérdida (¨turnover¨) de cada tipo de profesional de la salud que anticipa en su organización durante los próximos doce (12) meses.

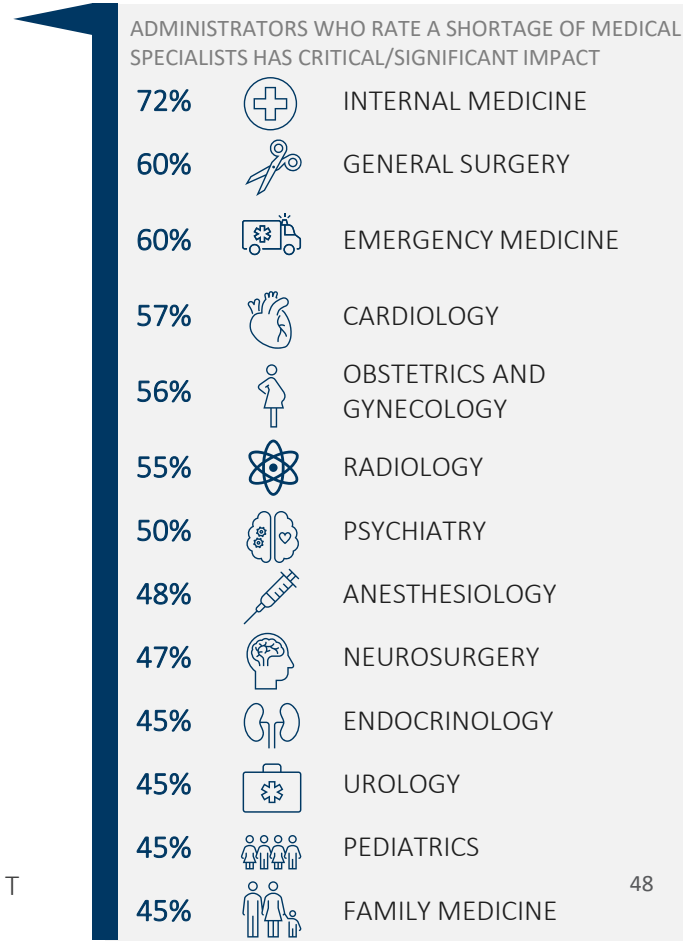
Shortages among specialists, subspecialists, and nurses have greatest perceived impact on operational effectiveness.

Specialists that are seen as most important to operations include internal medicine, surgery, and emergency medicine.

SHORTAGE OF [EMPLOYEE TYPE] IMPACT ON OPERATIONAL EFFECTIVENESS



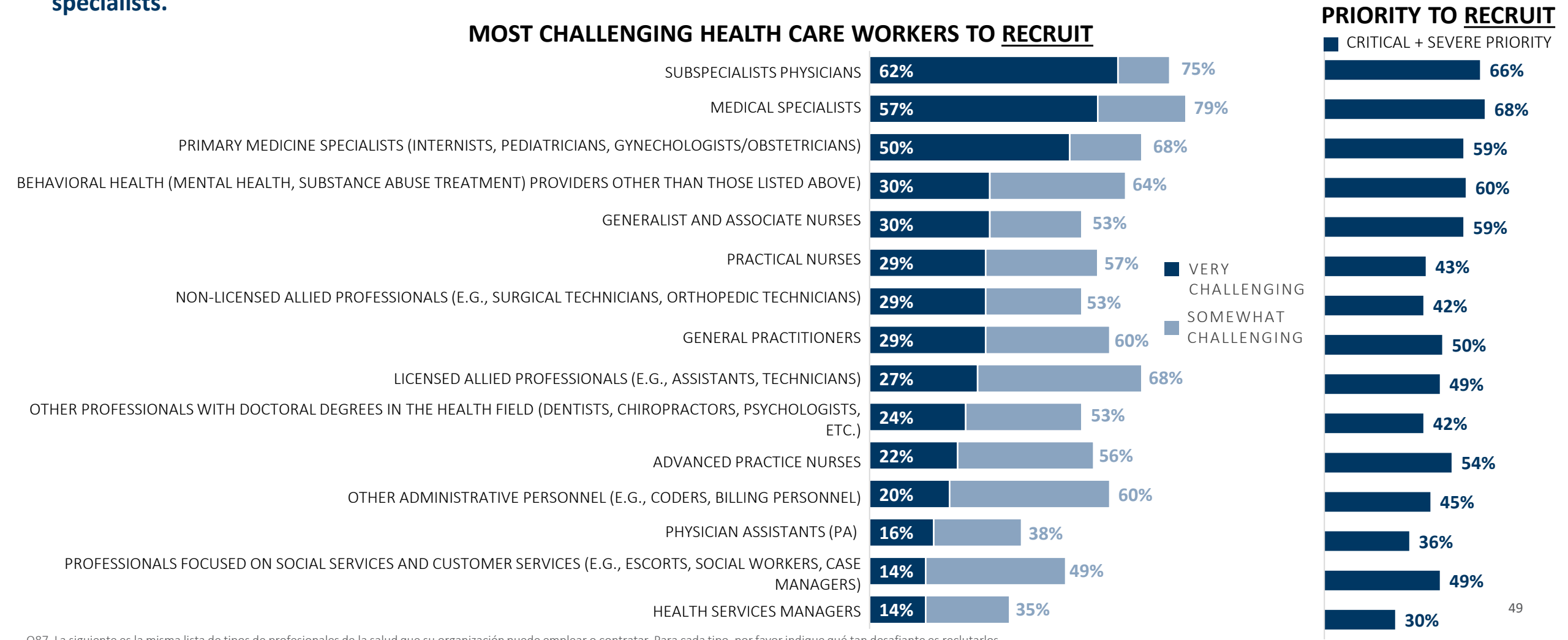
SPECIALISTS MOST IMPORTANT TO EFFECTIVE OPERATIONS



Q83. A continuación encontrará una tabla con los tipos de profesionales de la salud que su organización puede necesitar para operar efectivamente. En la tabla, indique en qué medida la escasez o falta de cada tipo de profesional impacta la efectividad de su organización.
Q84. Por favor, seleccione todos los tipos de médicos especialistas que son críticos para la operación efectiva de su organización.

Specialists and subspecialists are both the most challenging and highest priority employees to recruit.

General practitioners, primary care physicians, and generalist nurses are also high priority recruits, though slightly less challenging than specialists.

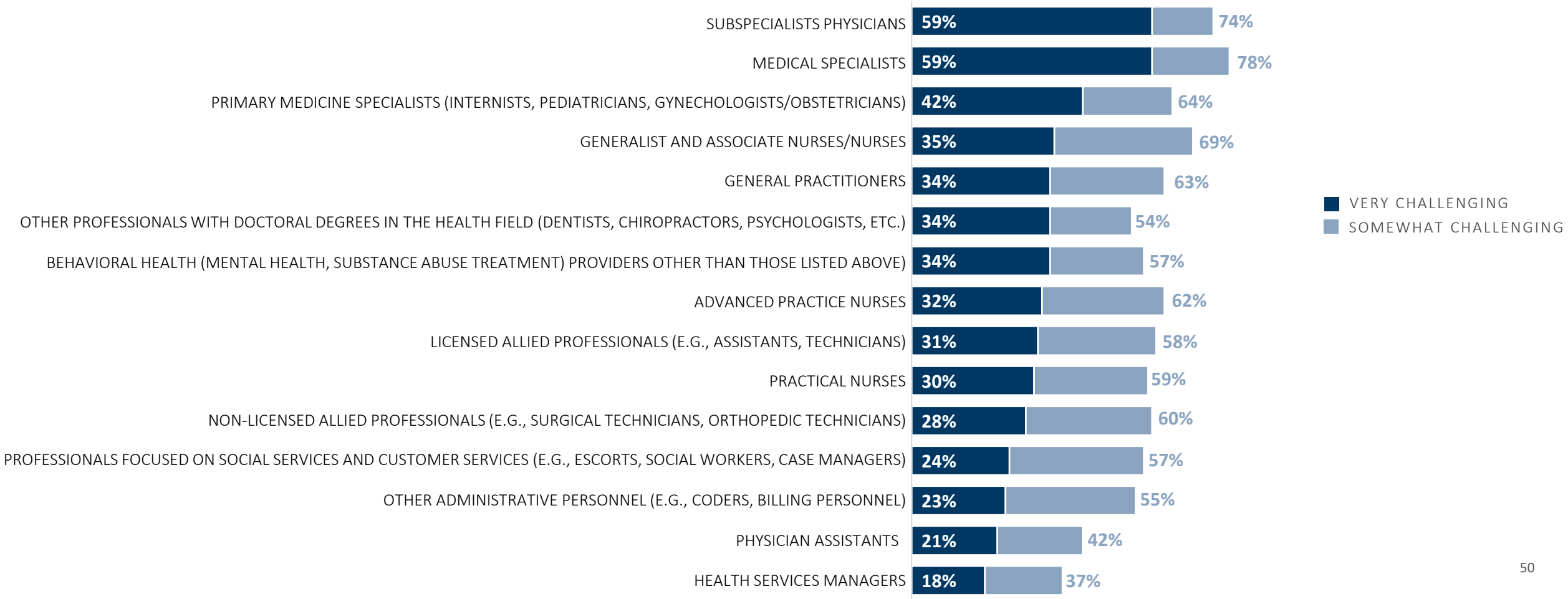


Q87. La siguiente es la misma lista de tipos de profesionales de la salud que su organización puede emplear o contratar. Para cada tipo, por favor indique qué tan desafiante es reclutarlos.
Q88. La siguiente es la misma lista de tipos de profesionales de la salud que su organización puede emplear o contratar. Por favor indique qué tan prioritario es para su organización el retener cada tipo de profesional de la salud.

Specialists and subspecialists are also the most challenging to retain.

General practitioners and primary care physicians are comparatively easier to retain than specialists.

MOST CHALLENGING HEALTH CARE PROFESSIONALS TO RETAIN

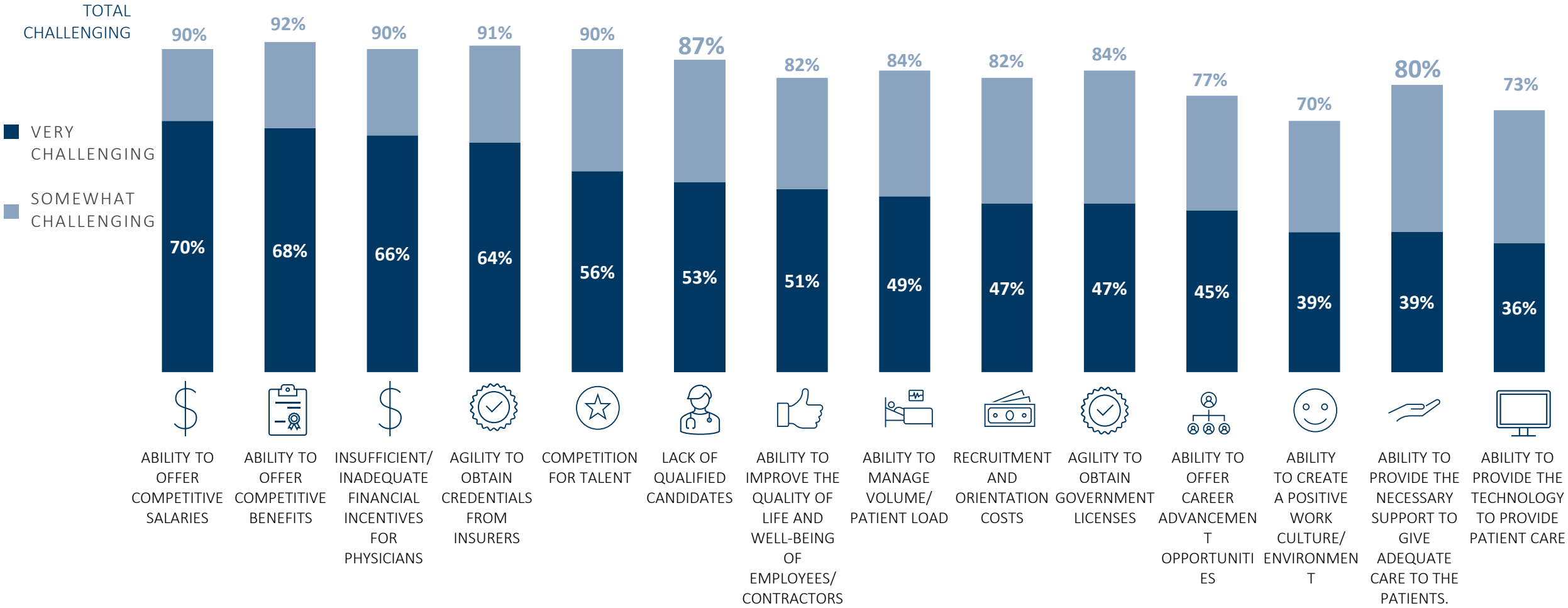


Q89. La siguiente es la misma lista de profesionales de la salud que su organización puede emplear o contratar. Para cada tipo, por favor indique qué tan desafiante es retenerlos.

Most significant challenges to recruiting and retaining physicians revolve around pay, benefits, and incentives

Work culture, career advancement, and providing necessary support – while broadly challenging to recruiting physicians – are not most significantly challenging.

CHALLENGES TO RECRUITING AND RETAINING PHYSICIANS

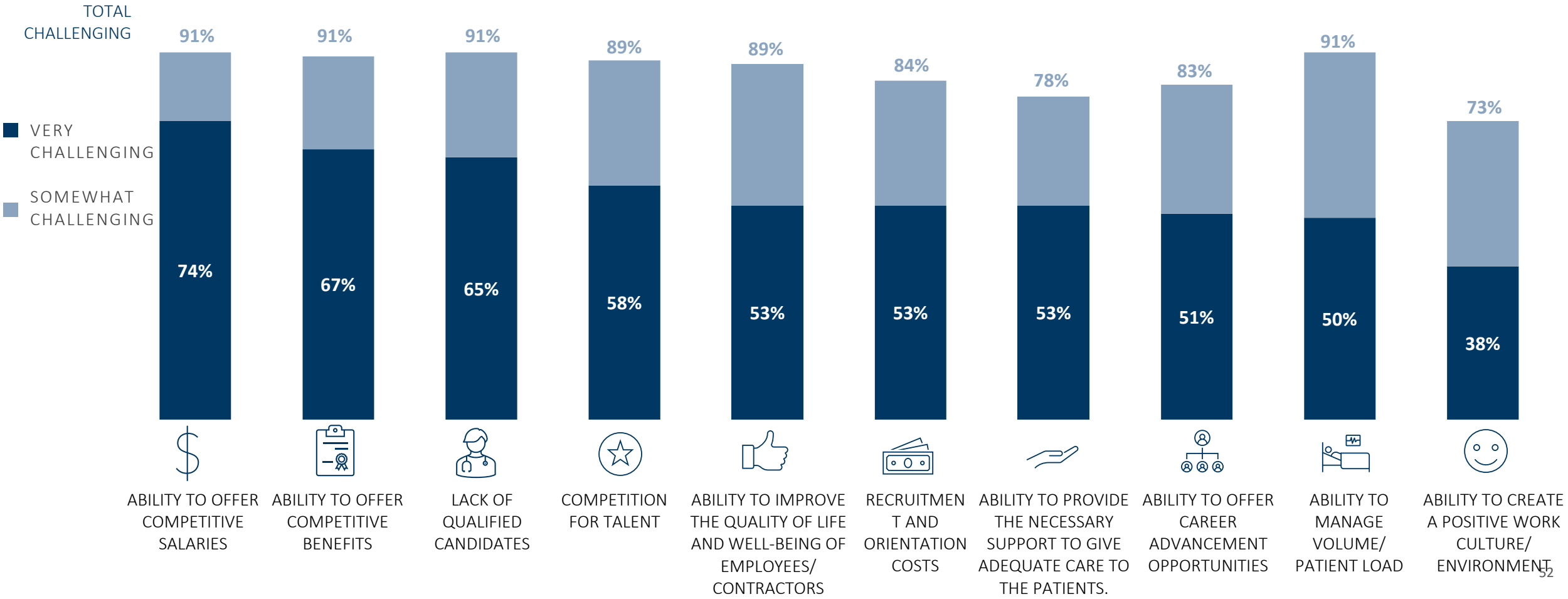


Q92. La siguiente es una lista de posibles desafíos para reclutar y retener médicos. Por favor, califique cada uno de los desafíos basándose en el impacto en su organización.

Pay and benefits is a top challenge to recruiting other nurses and other professionals too, followed by lack of qualified candidates

Other challenges like competition or talent, improving quality of life, and recruitment costs also present significant challenges to most administrators.

CHALLENGES TO RECRUITING AND RETAINING NURSES AND HEALTH CARE PROFESSIONALS

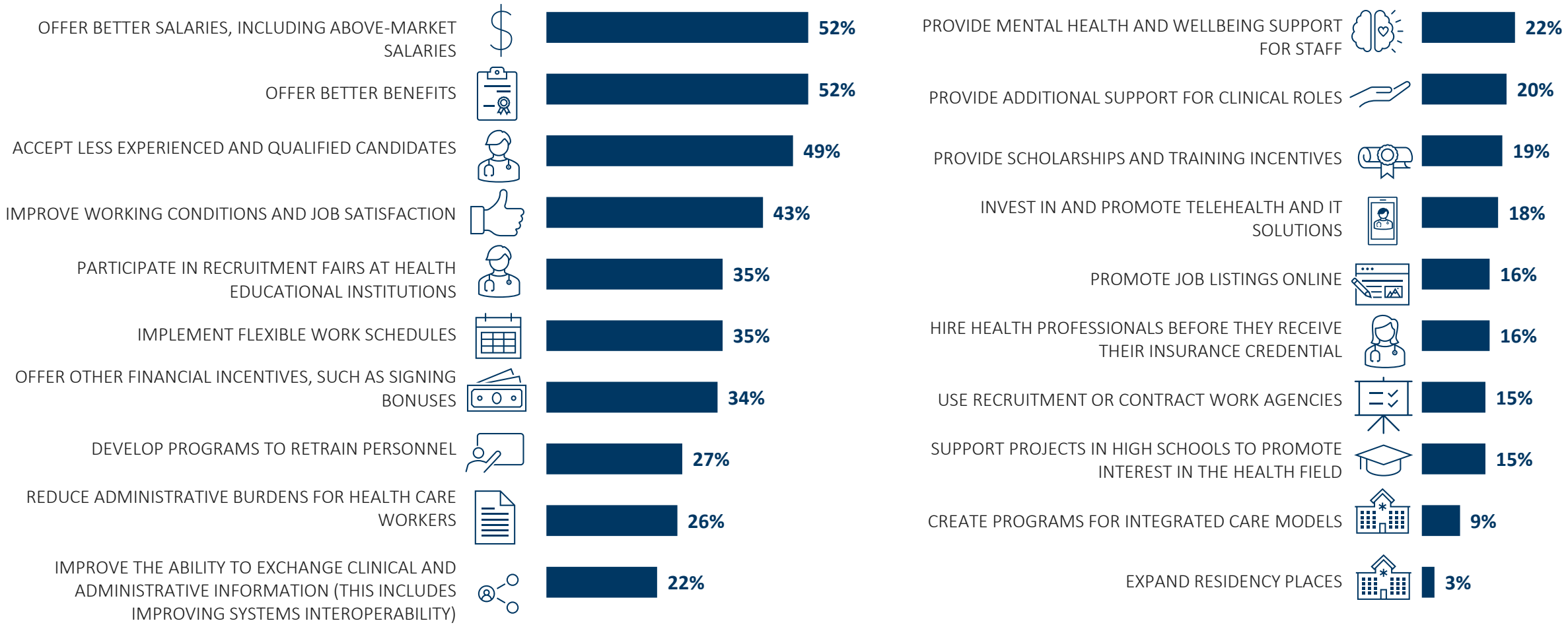


Q93. La siguiente es una lista de posibles desafíos para reclutar y retener enfermeros/enfermeras y otros profesionales de salud. Para cada uno, indique qué tan desafiante es para su organización

Despite challenges around pay and benefits – most administrators admit that they offer above market salaries and better benefits. Nearly half are accepting less experienced candidates

While administrators are largely focused on what they see as the biggest challenges to recruitment, there is plenty of opportunity to leverage other resources like promoting job listings online, providing scholarships and training incentives, and expanding residencies.

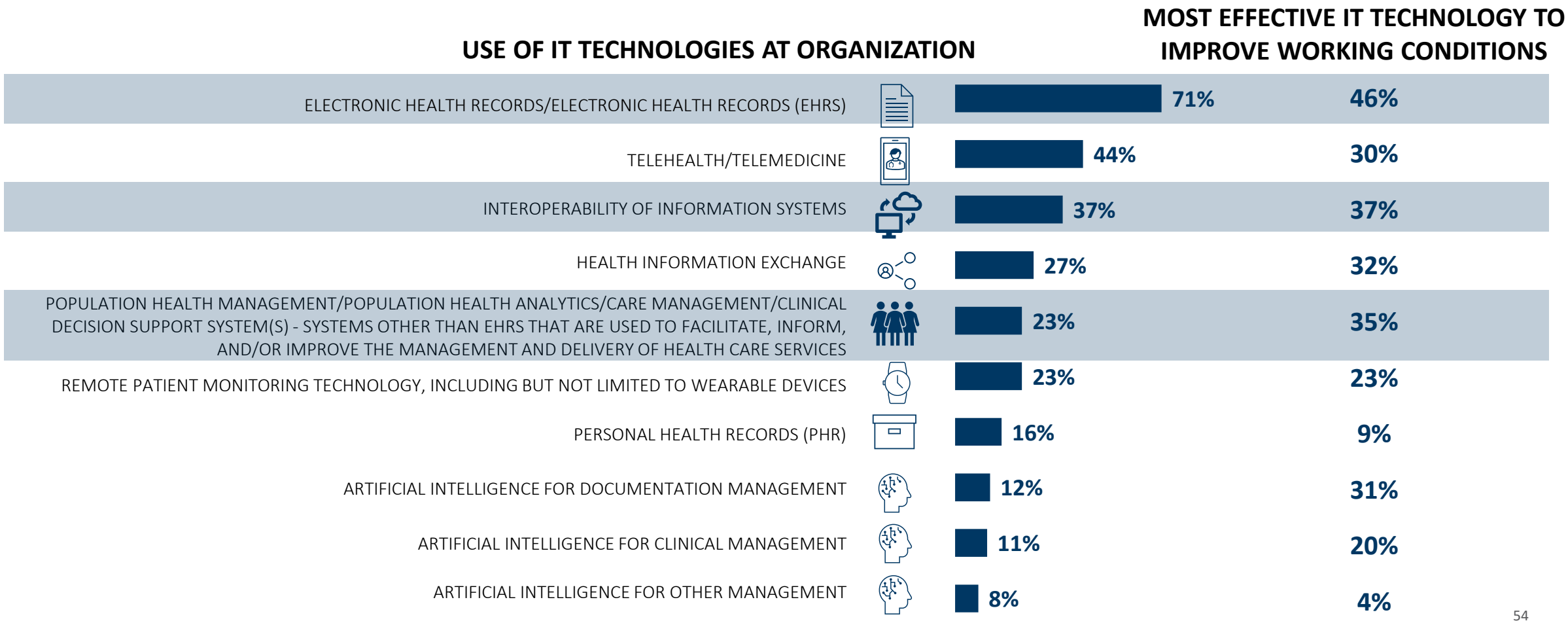
METHODS USED TO IMPROVE RECRUITMENT



Q94. ¿Cuál de las siguientes medidas ha tomado su organización para mejorar el reclutamiento de profesionales de la salud?

Nearly three quarters of administrators use electronic health records – which they rank as most effective at improving working conditions. There is clear opportunity to expand IT technology use

Other technologies like telehealth, interoperability of information systems, and health information exchange are all technologies that are all seen as effective tools to improve working conditions but used by less than half of administrators.



Q95: ¿Cuál de las siguientes tecnologías de información actualmente utilizadas en el sector de la salud ha incorporado en las operaciones de su organización, ya sea en manejo de servicios, prestación de servicios y/o funciones administrativas? Por favor seleccione todas las que apliquen.
Q96. Volviendo a la misma lista de tecnologías de información, por favor elija las tres principales tecnologías que cree que serían más efectivas para mejorar las condiciones de trabajo de los profesionales de la salud en Puerto Rico.

Student and Resident Landscape

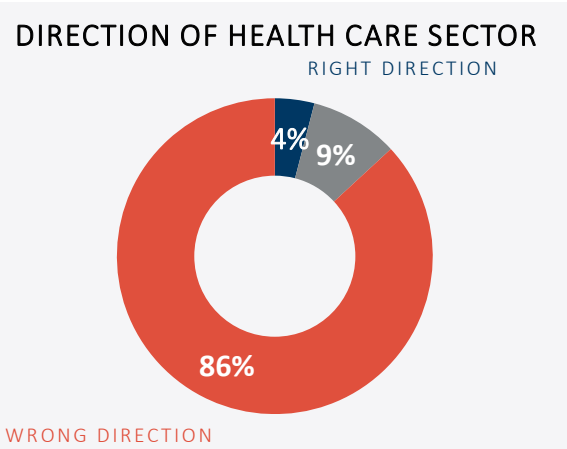
(AMONG STUDENTS AND RESIDENTS ONLY)

Student focused issues – like increased residencies and more incentives for students – are top of mind for them, along with other problems like workforce shortages and financial challenges.

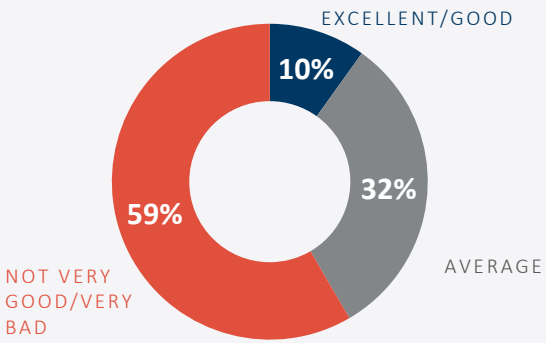
Like other groups, students and residents have a dim outlook on the future of the healthcare sector and report poor working conditions.

STUDENT AND RESIDENT

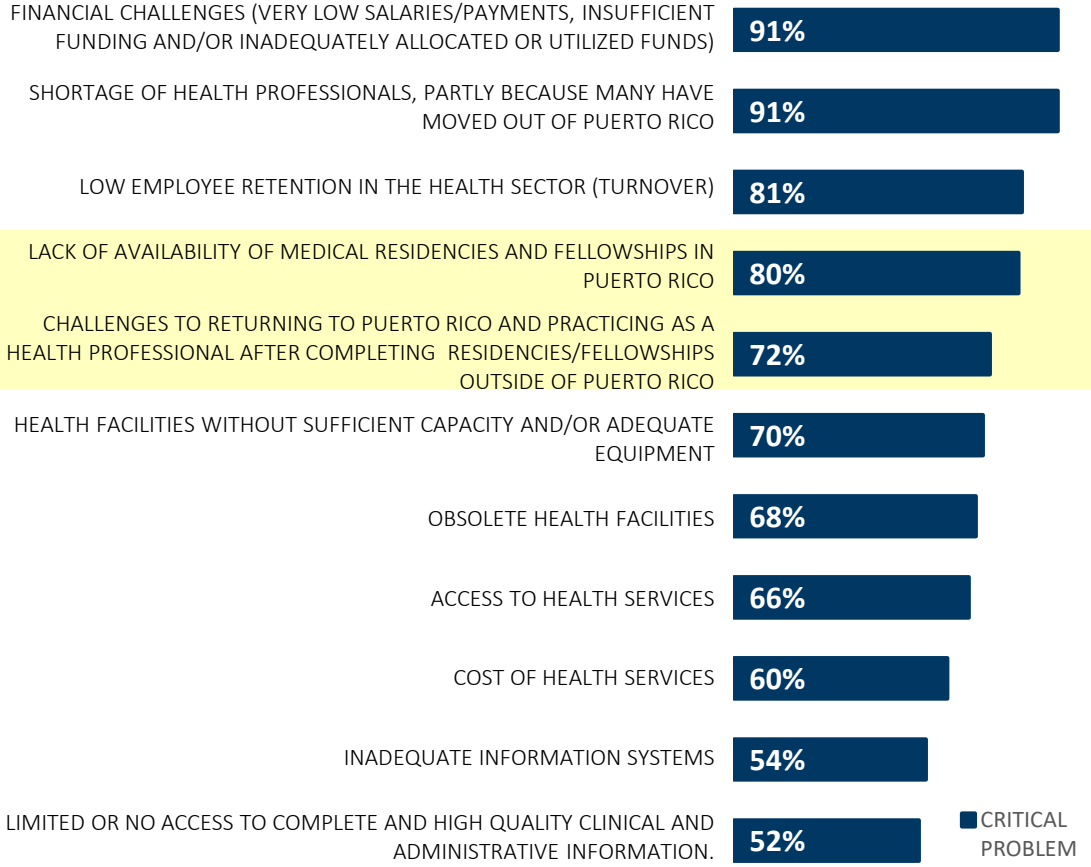
DIRECTION OF HEALTH CARE SECTOR



WORKING CONDITIONS IN SECTOR



BIGGEST PROBLEMS FACING HEALTH CARE SECTOR



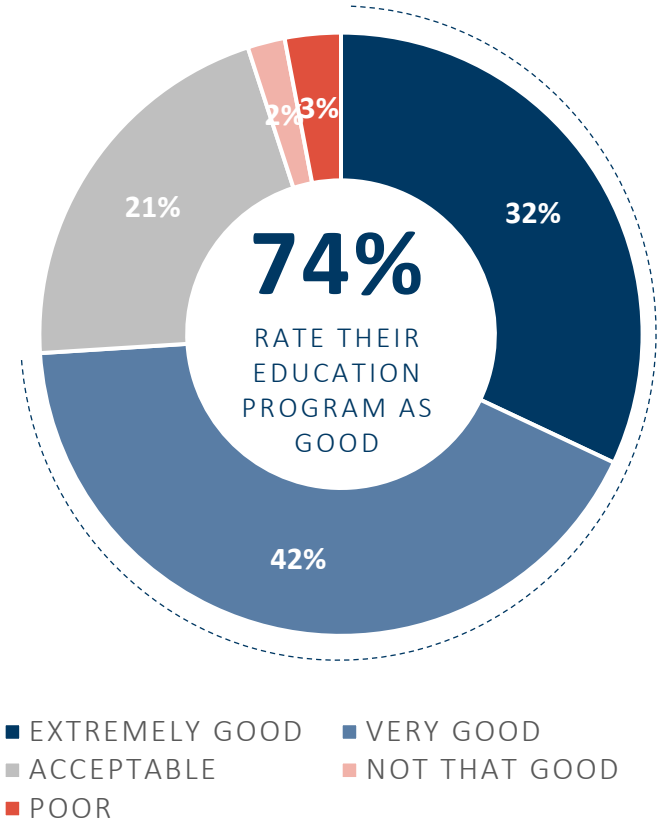
TOP PRIORITIES FOR PUERTO RICO GOVERNMENT LEADERS TO ADDRESS

1	68%	CREATE INCENTIVES FOR HEALTH PROFESSIONS RESIDENTS/STUDENTS WITH THE GOAL OF RETAINING THEM IN PUERTO RICO
2	65%	CREATING INCENTIVES FOR PHYSICIANS AND OTHER HEALTH PROFESSIONALS TO RETAIN THEM IN PUERTO RICO
3	59%	INCREASE THE NUMBER OF MEDICAL RESIDENCIES
4	35%	INCREASE THE EFFICIENCY AND EFFECTIVENESS OF GOVERNMENT ADMINISTRATIVE PROCESSES.
5	29%	INCREASING ACCESS TO HEALTH CARE SERVICES

Q33. En términos generales, ¿cómo describiría el estatus del sector de salud de Puerto Rico? | Q34. A continuación encontrará una lista de posibles problemas a los que se enfrenta el sector de salud de Puerto Rico. Para cada uno de estos problemas, por favor califique la magnitud del problema utilizando la escala que se proporciona a continuación.| Q35. En su opinión, ¿cuáles son las cinco (5) prioridades que los líderes del gobierno de Puerto Rico deberían abordar que tendrían el mayor impacto positivo en el sector de salud de Puerto Rico? | Q67. ¿Cómo calificaría las condiciones de trabajo actuales de los profesionales de la salud en Puerto Rico que operan en su área/campo?

Most students believe their program has prepared them for their future careers in health care

Open ends among those who rate programs as mediocre or worse shows that these attitudes are driven by student complaints about lack of academic strength, lack of clinical opportunities, and not feeling that they are a priority to administrators.



AMONG STUDENTS WHO RATE PROGRAM AS ACCEPTABLE/NOT GOOD/POOR

"I FIND THAT THEY ARE PROVIDING THE CORRECT AND APPROPRIATE EDUCATION HOWEVER THEY DO NOT USE THE BEST STAFF TO MAXIMIZE ACADEMIC ACHIEVEMENT, SINCE THEY DO NOT UNDERSTAND EACH OTHER WELL AND/OR DO NOT SPEAK CORRECTLY EITHER OF THE TWO LANGUAGES IN WHICH IT IS TAUGHT IN THE INSTITUTION."

"THE INSTITUTION TRIES TO DO WHAT THEY CAN FOR STUDENTS AND THEY HAVE MADE CHANGES TO IMPROVE THE ACADEMIC SYSTEM CURRENTLY. THERE IS STILL A LOT OF ROOM FOR IMPROVEMENT BUT THERE ARE DOCTORS WHO ARE WILLING TO GO THE EXTRA MILE IN ENSURING THAT STUDENTS DO WELL AND OBTAIN THE NECESSARY INFORMATION AND SKILLS FOR OUR FUTURE PATIENTS."

"AFTER SPENDING TWO YEARS CONDUCTING RESEARCH AT AN INSTITUTION IN THE U.S., I'VE REALIZED HOW MUCH WE LACK IN CLINICAL OPPORTUNITIES. FOR EXAMPLE, THIRD-YEAR ROTATIONS; IN MY SCHOOL, THEY ARE VERY POORLY DESIGNED, AND BY THE END OF THE ROTATION, WHAT YOU LEARN IS SUPERFICIAL. ON THE OTHER HAND, THE VARIETY IN CLINICAL ROTATION OFFERINGS IS LACKING; WE NEVER ROTATE THROUGH AN ER, A TRAUMA SERVICE, AN INTENSIVE CARE UNIT, OR ANY OF THE OTHER SUBSPECIALTIES LIKE NEUROSURGERY, ORTHOPEDICS, ETC. COMPARED TO STUDENTS IN THE U.S., WE FALL BEHIND WHEN IT COMES TO CLINICAL EXPOSURE."

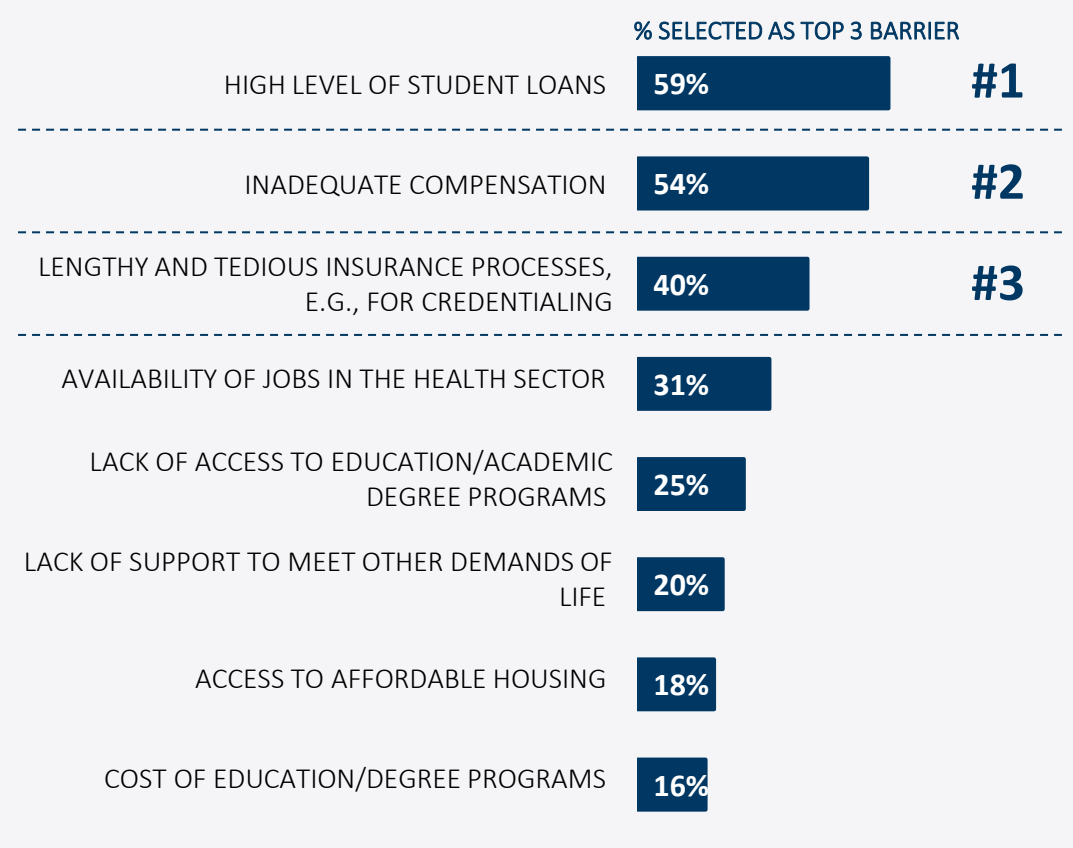
"THE STUDENT IS NOT A PRIORITY. TEACHERS DON'T TEACH PROPERLY TO HELP US PASS THE STEPS AND THE ADMINISTRATION MAKES DETERMINATION AFTER DETERMINATION THAT CAUSES THEIR STUDENTS TO BE AFFECTED. CONSEQUENTLY, THEY MAKE US LESS COMPETITIVE STUDENTS. IF YOU COME OUT A GOOD DOCTOR, IT'S ON YOUR OWN, NOT THE SCHOOL."

Q61. ¿En qué medida cree que el programa educativo en el que está matriculado lo está preparando para su trabajo futuro en el sector de la salud? | Q62. Indicó que en su opinión el programa educativo en el que está matriculado _____ ¿Por qué cree que es así?

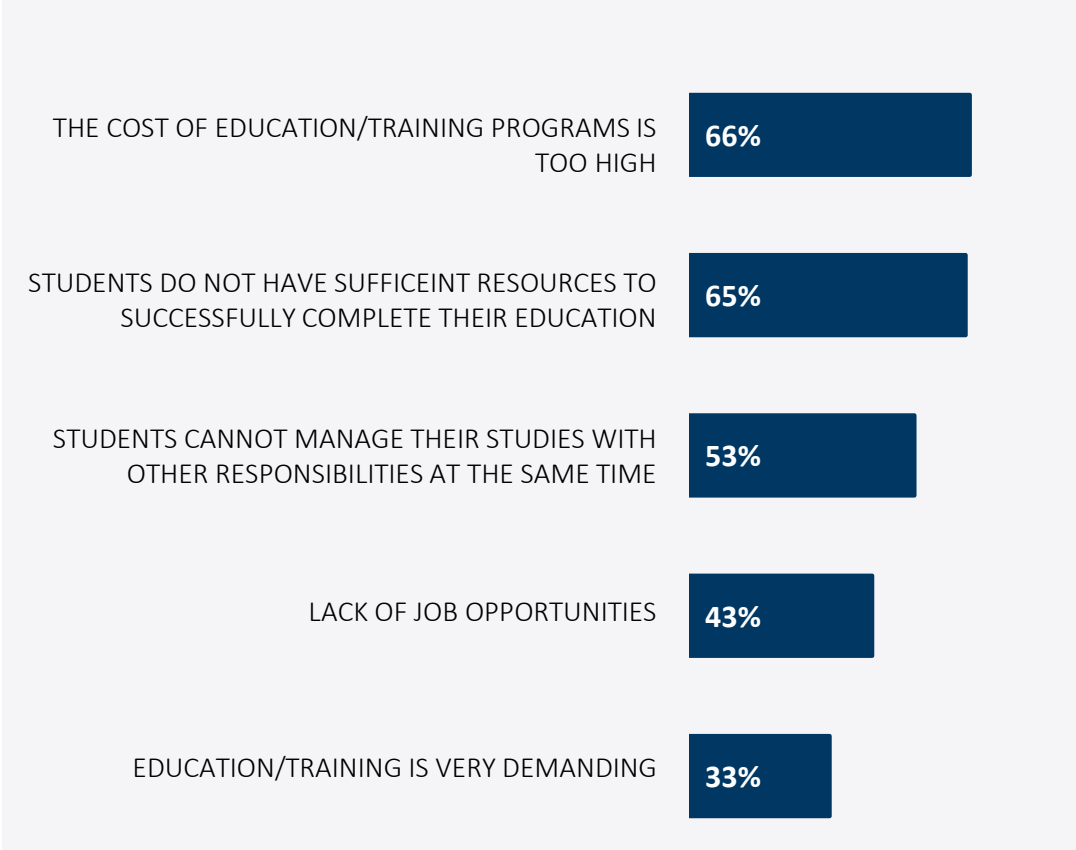
Cost of programs and follow up student loans are seen as key barrier to students completing degree and reason for those dropping out.

Low compensation, lengthy insurance credentialling processes are also seen as top barriers to completing a degree, while students also believe that lack of sufficient resources to complete their education is a key reason for drop out.

BARRIERS TO COMPLETING DEGREE



REASONS PEOPLE DROP OUT OF DEGREE PROGRAM

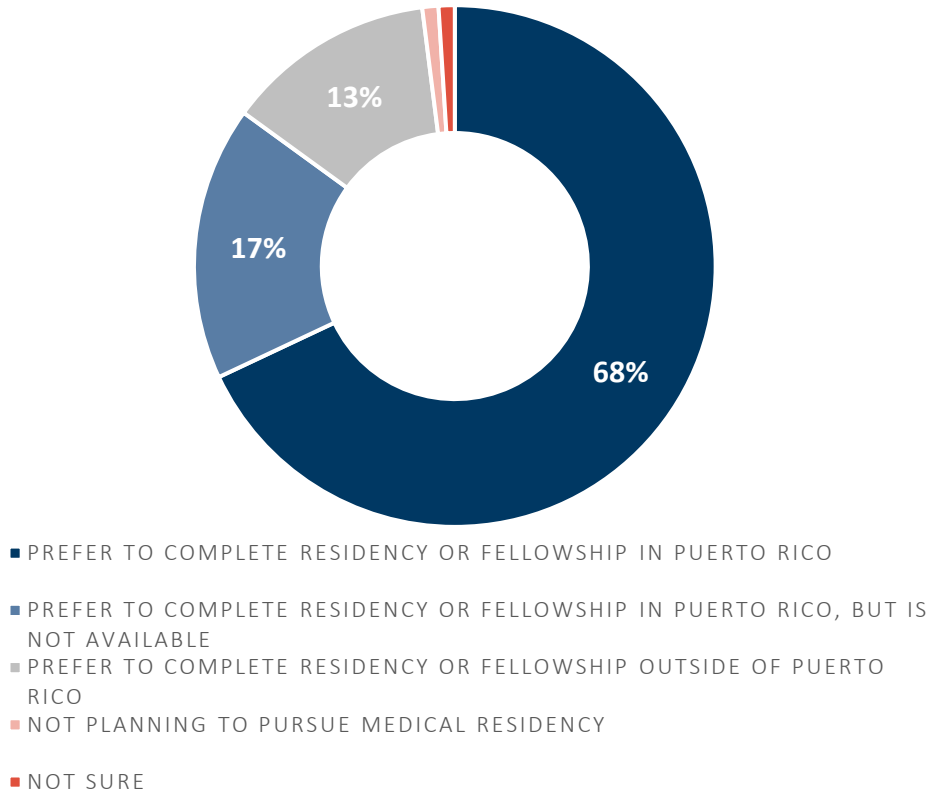


Q73: Por favor seleccione y jerarquice en orden descendiente (1 siendo la barrera mayor) las tres (3) barreras más significativas para completar su carrera en Puerto Rico. Arrastre y suelte sus tres principales selecciones.
Q74: En su opinión, ¿cuáles son las tres (3) razones principales por las que individuos abandonan programas de educación/entrenamiento para profesionales de la salud?

Most students prefer to complete their residency or fellowship in Puerto Rico, though some indicate it is not available

While a small sample size, among the few who plan to complete a residency outside of Puerto Rico, the lack of positions and quality are main reasons for wanting to complete residency abroad.

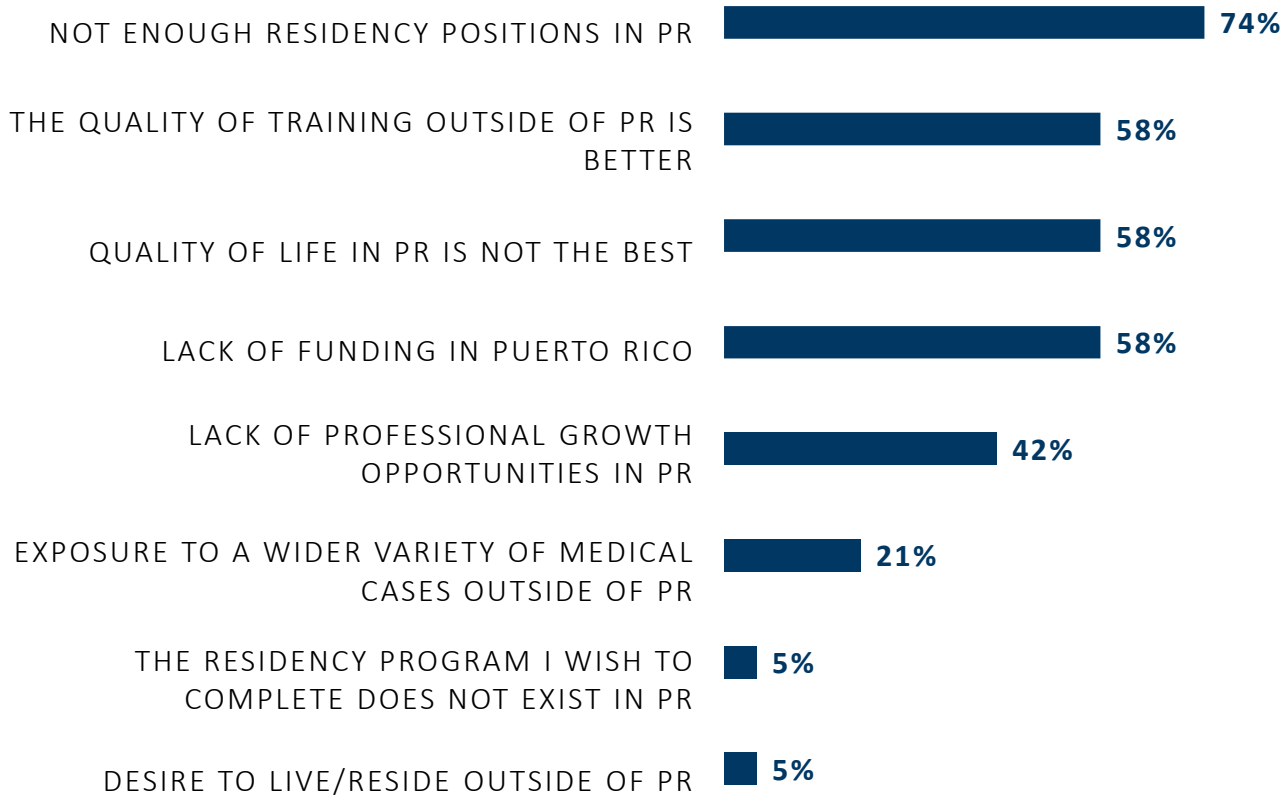
WHERE ARE THEY DOING THEIR RESIDENCY OR FELLOWSHIP



REASONS FOR NOT COMPLETING IT IN PUERTO RICO*

**SMALL SAMPLE SIZE, RESULTS ARE DIRECTIONAL*

AMONG STUDENTS WHO DO NOT PLAN TO COMPLETE THEIR RESIDENCY IN PUERTO RICO

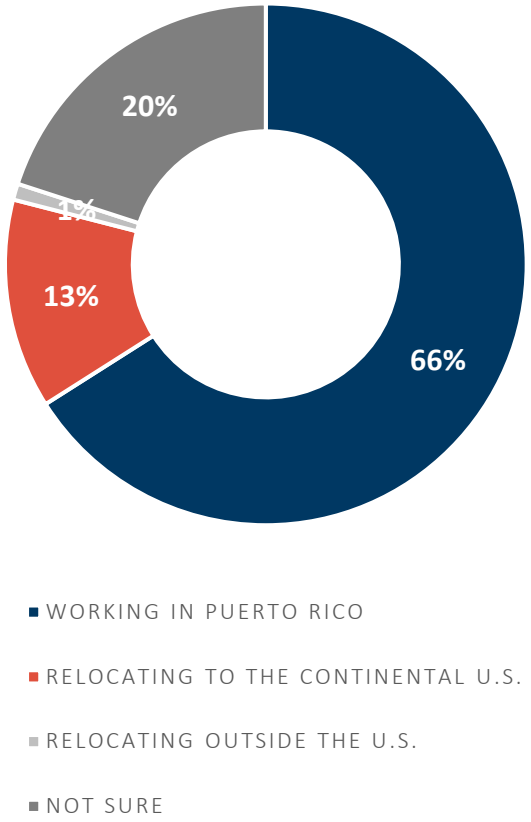


Q63. Una vez complete su programa educativo, ¿cuál de las siguientes opciones describe mejor su preferencia para completar una residencia médica? | Q64. Usted indicó que prefiere completar su residencia médica fuera de Puerto Rico, ¿por qué?

Two thirds of students plan to work in Puerto Rico after residency, with a few planning to head to the U.S., and some still unsure.

While a small sample size, among the few who plan leave for the U.S. after residency – more money, better working conditions, and better quality of life are key drivers of the decision.

FUTURE PLANS AFTER RESIDENCY/FELLOWSHIP



REASONS FOR NOT PLANNING TO WORK IN PUERTO RICO*

**SMALL SAMPLE SIZE, RESULTS ARE DIRECTIONAL*

AMONG STUDENTS WHO DO NOT PLAN TO WORK IN PUERTO RICO AFTER RESIDENCY

Q65. Después de completar su preparación académica, ¿piensa trabajar en Puerto Rico, trasladarse a los EE.UU. continentales o trasladarse fuera de los EE.UU.? | Q66. ¿Cuáles son las tres (3) razones principales por las que piensa trabajar fuera de Puerto Rico, ya sea en EE.UU. continentales o en otro lugar?

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Appendix D
Puerto Rico Healthcare Workforce Demand-Supply Model

Model Concept and Principles

The workforce model incorporates key elements from the Health Resources & Services Administration (HRSA) Health Workforce Simulation Model's established framework for the United States (US) workforce.

The Issue: The validated accepted perception in Puerto Rico is that the healthcare workforce is currently insufficient to meet the healthcare demands of the Puerto Rico population. In other words, the Puerto Rico workforce is in dis-equilibrium and there is an existing shortage. The shortage gap extends to most primary care providers and specialists, and these shortage is expected to deepen over time. For these reasons, the current workforce supply cannot be used to predict future healthcare workforce supply needs.

The Model: The workforce model uses a benchmarking approach by building in assumptions about service demand and associated workforce needs based on the experience of the U.S. in identifying and addressing certain workforce deficits. Its dynamic nature enables flexibility in modeling changes in service demand across various categories, geographic regions, demographics (age, social vulnerability), and programs (if needed). Based on defensible, data-driven foundations tailored to the unique characteristics of the Puerto Rico healthcare market, this model can be applied to address a range of questions, such as how best to utilize certain funds to drive utilization or promote the availability of certain services. Additionally, it allows for predicting workforce supply gaps by comparing current workforce configuration to projected needs.

Model Components and Data Sources

The model focuses on three major components: population growth, demand for providers, and supply of providers.

Population Growth

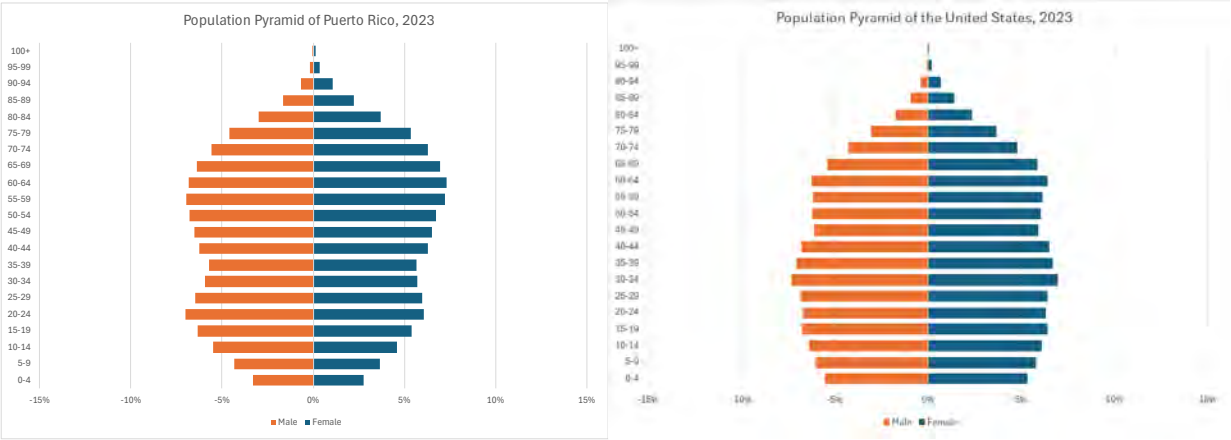
The model uses Census ACS data for Puerto Rico as its foundation population. It incorporates population projections from the Census International Database (IDB) to forecast future demographic trends. These projections are segmented by age group, county, and region, providing a granular understanding of the evolving population dynamics in Puerto Rico. The data sources for the population growth component include the Census International Database (IDB), the American Community Survey (ACS), and the US Census.

Demand for Providers

The model estimates provider demand by using the US mainland demand as the benchmark (or 'target'). It uses healthcare utilization rates and staffing ratios to establish baseline demand. Given the unique healthcare landscape of Puerto Rico, the model was adapted to account for factors like specialty shortages, and differing age profiles and disease patterns, providing a more tailored and relevant assessment.

Puerto Rico's population is aging, compared to the United States. More than 1 in 5 residents are now over 65, which is higher than the US average, according to an analysis by Hunter College's Center for Puerto Rican Studies.[1]

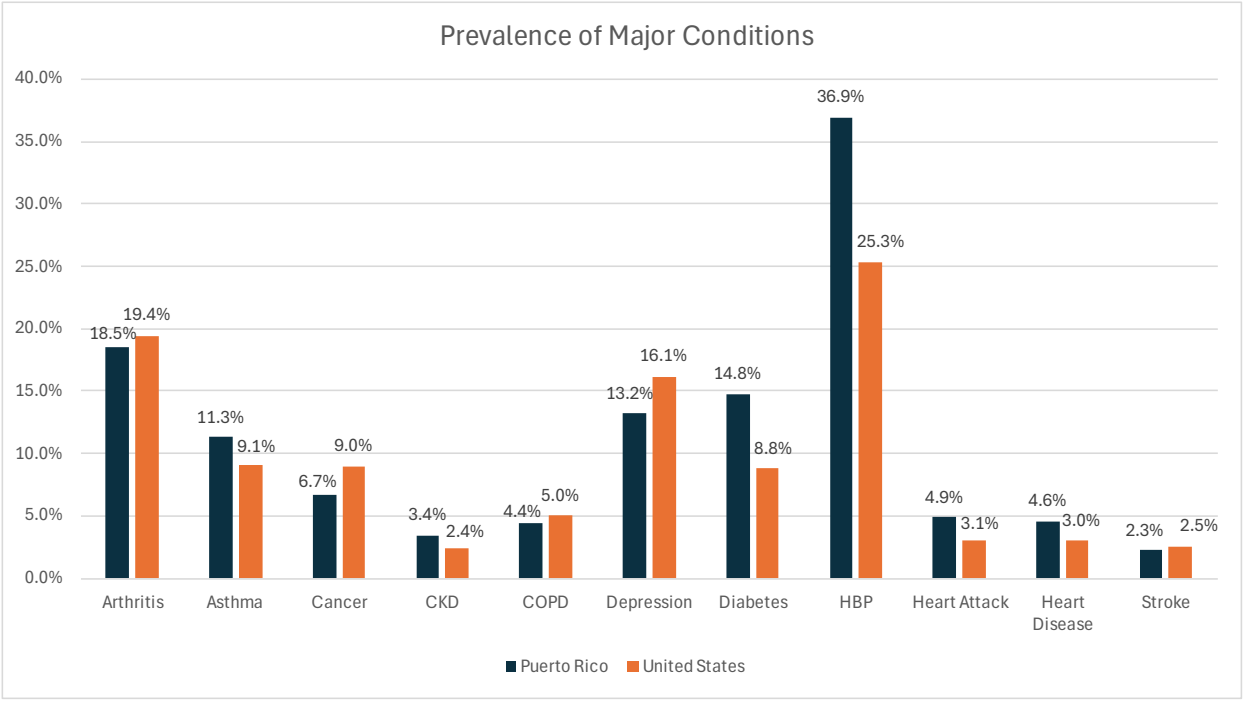
Figure 1: Puerto Rico and United States Population Pyramid



Source: United Nations

Population health profiles differ between Puerto Rico and the US. For example, conditions such as high blood pressure, diabetes, and asthma are more prevalent in Puerto Rico, compared to the US.

Figure 2: Disease Prevalence (Major Conditions) in Puerto Rico and United States



Source: FTI calculations based on Behavioral Risk Factor Surveillance System (BRFSS) 2021 data.

[1] Socio-Demographics Data of Puerto Ricans in the United States and Puerto Rico: 2010 – 2021 https://public.tableau.com/app/profile/centropr/viz/Socio-DemographicDataofPuertoRicansintheUnitedStatesandPuertoRico2010-2021/PopSTY

By examining Puerto Rico's claims and utilization data, the model incorporates healthcare providers' current distribution across care settings (i.e. doctor's office, hospital inpatient, and other settings) to determine how to best invest resources to address emerging gaps across care settings. Based on analysis of Puerto Rico's insurer claims data, majority of Puerto Rico's providers are practicing in the office setting.

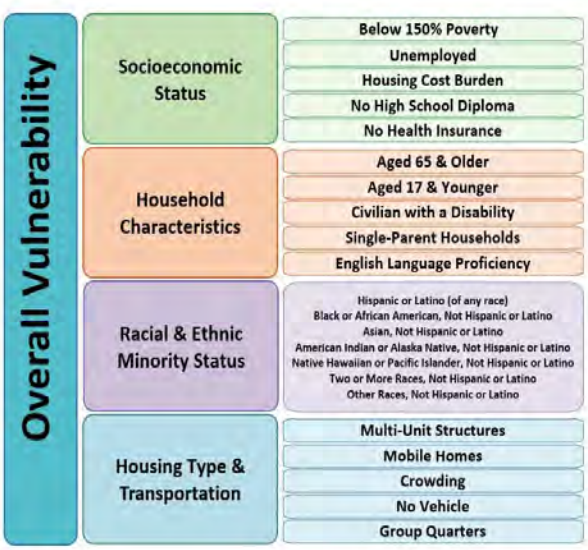
Table 1: Utilization by Specialty and Care Setting

Provider Type	Office	Inpatient	Outpatient	ED
General/Family Practice	93.45%	1.17%	0.32%	5.06%
Internal Medicine	89.44%	9.00%	0.51%	1.04%
Pediatrics	75.37%	11.68%	7.46%	5.49%
OB/GYN	92.73%	4.55%	0.62%	2.10%
Surgery	73.33%	18.38%	7.14%	1.15%
Cardiology	88.11%	9.49%	2.13%	0.27%
Endocrinology	92.65%	7.32%	0.02%	0.00%
Gastroenterology	90.25%	4.49%	5.19%	0.07%
Geriatrics	98.27%	1.17%	0.36%	0.20%
Nephrology	70.31%	29.00%	0.64%	0.04%
Oncology	97.21%	2.41%	0.36%	0.02%
Pulmonology	83.61%	15.72%	0.65%	0.02%
Rheumatology	99.21%	0.38%	0.41%	0.01%
Psychology and Psychiatry	97.84%	0.68%	1.20%	0.28%
Neurology	88.21%	10.51%	1.05%	0.24%
Orthopedics	82.03%	9.19%	8.29%	0.48%
Urology	90.97%	5.64%	3.07%	0.32%
Physical Therapy	95.32%	4.06%	0.58%	0.04%
Ophthalmology	99.31%	0.27%	0.37%	0.06%

Source: Puerto Rico MMM, Triple S, MCS, and Humana Claims data (2023)

The demand model also considers social vulnerability and its impact on care access and needs. Social Vulnerability refers to the demographic and socioeconomic factors (such as poverty, lack of access to transportation, and crowded housing) that adversely affect communities that encounter hazards and other community-level stressors. In theory, more vulnerable populations would require higher health needs. The SVI index ranges from 0 (least vulnerable) to 1 (most vulnerable). In the model, if a given region has an SVI that is significantly different from the PR overall SVI, an adjustment was made to the demand of selected specialties within the health region, to account for the additional or reduced needs of the population.

Figure 3: Social Vulnerability



Source: CDC https://www.atsdr.cdc.gov/placeandhealth/svi/overall-social-vulnerability.html

The model estimates demand by provider type and projects to 2050 by region. The data sources for the demand component include the American Community Survey (ACS), CDC Behavioral Risk Factor Surveillance System (BRFSS), the Medical Expenditure Panel Survey (MEPS), Bureau of Labor Statistics (BLS), Association of American Medical Colleges (AAMC), Organisation for Economic Co-operation and Development (OECD), and Health Resources & Services Administration (HRSA).

Supply of Providers

The model utilizes Puerto Rico's workforce data to estimate the current supply of healthcare providers and linear provider growth rate across years. The change in supply between years considers various factors that influence the change in supply, including new entrants, retirements, emigration, and career changes.

A large portion of Puerto Rico's healthcare workforce is composed of practitioners over age 60. The aging of the healthcare workforce is particularly pronounced in certain specialties such as pediatrics, rheumatology, OB/GYN, and surgery, which can pose challenges to the healthcare system as experienced providers are nearing retirement age or providing care at less than full capacity.

Table 2: Provider Age Breakdown in Puerto Rico – Below and Above 60

Provider Type	60 or Younger	Over 60
General/Family Practice	70%	30%
Intenal Medicine	60%	40%
Pediatrics	48%	52%
OB/GYN	53%	47%
Surgery	53%	47%
Nurse	90%	10%
Physician Assistant	96%	4%
Cardiology	51%	49%
Endocrinology	63%	37%
Gastroenterology	69%	31%
Geriatrics	76%	24%
Nephrology	64%	36%
Oncology	67%	33%
Pulmonology	64%	36%
Rheumatology	46%	54%
Psychology and Psychiatry	81%	19%
Neurology	71%	29%
Orthopedics	65%	35%
Urology	55%	45%
Physical Therapy	80%	20%
Ophthalmology	63%	37%

Source: Oficina de Reglamentación y Certificación de los Profesionales de la Salud (ORCPS)

The supply model considers provider availability based on daily patient volume and time spent doing non-administrative work. In the US, on average, specialists and primary care physicians (PCPs) see about 20.2 and 19.7 patients per day, respectively. Based on the Puerto Rico Workforce Survey results, 23 and 21 patients are seen by a specialist or PCP In Puerto Rico, daily. In the US, physicians spend 31% of their time on administrative work, on average. Based on the Puerto Rico Workforce Survey Results, Puerto Rico physicians spend an average of 32% of their time on administrative work.[2] Given the minimal differences

[2] Rajaee L., 2022. "How Many Patients Are Most Primary Care Physicians Seeing?" Available at: https://www.elationhealth.com/resources/blogs/how-many-patients-are-most-primary-care-physicians-seeing; Dyton J., 2023. "How Many Hours do Doctors Work?" Available at: https://www.whitecoatinvestor.com/how-many-hours-do-doctors-work/ ; Bae, S. H, 2023. Association of work schedules with nurse turnover: a cross-sectional national study. International Journal of Public Health, 68, 1605732; HRSA, 2023. "VII. Physician Assistant Model Components" Available at: https://bhw.hrsa.gov/data-research/projecting-health-workforce-supply-demand/technical-documentation/physician-assistant-model-components;

in daily patient volume and administrative workload across specialties between the benchmark (i.e. continental US) and Puerto Rico, no adjustments were made to the projected FTEs. In the model, each provider is assumed to be working at full capacity (i.e. 1 FTE).

Table 3: Proportion of Time Spent on Administrative Work

Specialty	Number of hours work in a week	Number of hours spent on Administrative Work in a week (US)	Proportion of Time Spent on Administrative Work (US)	Proportion of Time Spent on Administrative Work (PR)	Difference (PR-US)
Cardiology	56.2	16.0	28%	32%	4%
Endocrinology	48.9	16.0	33%	32%	-1%
Gastroenterology	52.3	13.0	25%	32%	7%
General/Family Practice	48.0	17.0	35%	30%	-5%
Geriatrics	50.0	15.5	31%	30%	-1%
Internal Medicine	51.0	18.0	35%	30%	-5%
Nephrology	54.9	18.0	33%	32%	-1%
Neurology	53.0	18.0	34%	32%	-2%
Nurse	41.3	16.5	40%	41%	1%
OB/GYN	53.9	15.0	28%	30%	2%
Oncology	52.6	18.0	34%	32%	-2%
Ophthalmology	45.3	10.0	22%	32%	10%
Orthopedics	52.9	14.0	26%	32%	6%
Pediatrics	47.0	15.0	32%	30%	-2%
Physical Therapy	49.9	19.0	38%	35%	-3%
Physician Assistant	43.0	15.5	36%	35%	-1%
Psychology and Psychiatry	46.6	16.0	34%	35%	1%
Pulmonology	53.3	15.5	29%	32%	3%
Rheumatology	47.2	15.5	33%	32%	-1%
Surgery	57.4	15.0	26%	32%	6%
Urology	54.7	14.0	26%	32%	6%
				Average Difference:	**1%**

Note: Average used

Source: See Footnote 2.

The model estimates supply by provider type and projects to 2050 by region. Data sources for the supply component include Oficina de Reglamentación y Certificación de los Profesionales de la Salud (ORCPS), Junta de Licenciamiento y Disciplina Médica (JLDM).

Model Architecture and Flow

The healthcare workforce demand/supply model architecture is detailed in Figure 4. The boxes on the left-hand side contain the three main elements of the model, described in 'Model Components and Data Sources' section.

Base Population

The model uses Census ACS and US Census data as its baseline population for Puerto Rico and employs Census IDB population projections to estimate future demographic shifts. These projections are categorized by age, county, and region, to provide a comprehensive outlook of Puerto Rico's evolving

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Regulsky E. "23 Physician Specialties and The Number Of Hours Spent On Paperwork" Available at: https://www.billingparadise.com/blog/23-physician-specialties-and-the-number-of-hours-spent-on-paperwork/#:~:text=According%20to%20the%20Medscape%20Physician,week%20on%20paperwork%20and%20administration; Stites M., 2023 "Nursing Documentation Burden: A Critical Problem to Solve" Available at: https://www.aacn.org/blog/nursing-documentation-burden-a-critical-problem-to-solve#:~:text=The%20U.S.%20Surgeon%20General's%20Advisory,Documentation%20burden%20is%20not%20benign

population dynamics. Disease prevalence for major chronic conditions were derived from the Behavioral Risk Factor Surveillance System (BRFSS).

Workforce Demand

Demand was estimated using the continental US as a benchmark (or 'target') for the number of providers needed per population, adjusted to account for Puerto Rico disease prevalence, and existing physician shortages. First, the model utilized a combination of Bureau of Labor Statistics (BLS) and Association of American Medical Colleges (AAMC) data to identify provider supply based on the US population. These provider-to-population ratios were then applied to Puerto Rico's population to generate localized demand estimates. Next, a variety of publicly available datasets were analyzed to customize the benchmark estimates to be tailored to Puerto Rico. Specifically, chronic conditions data from Behavioral Risk Factor Surveillance System (BRFSS), medical utilization by provider type and healthcare setting derived from the Medical Expenditure Panel Survey (MEPS) and Puerto Rico Claims Encounter Data, and supply adequacy/shortage data from the Organisation for Economic Co-operation and Development (OECD) and Health Resources & Services Administration (HRSA) were assessed to determine health care utilization patterns and resource needs within Puerto Rico's population and its health regions. Additionally, Social Vulnerability Index (SVI) from the Centers for Disease Control and Prevention (CDC), a place-based index that proxies for overall social vulnerability, was incorporated to account for demographic and socioeconomic factors (such as poverty, lack of access to transportation, and crowded housing) that could impact demand.

The 'final' demand, calculated using provider and population data, identified the number of providers needed to fully support the PR population based on continental US experience. Three different models were developed to estimate demand for health care providers: Target Workforce, Target Workforce (Age-adjusted), and Current PR Workforce.

- **Target Workforce** incorporates provider data based on the overall US supply of health care services, modified to be PR-specific.
- **Target Workforce (Age-adjusted)** utilizes provider data based on the US supply but is age-adjusted, modified to be PR age-specific. Age adjusting accounts for the different levels of providers and utilization needed for different age groups. For example, the continental US's number of pediatricians or geriatricians may be skewed by a different population distribution across ages than PR has.
- **Current PR Workforce** incorporates provider data based on the current Puerto Rico healthcare workforce supply from the Oficina de Reglamentación y Certificación de los Profesionales de la Salud (ORCPS). The Current PR Workforce Model is the 'status quo' scenario, which shows what the workforce demand will look like if no changes are made to the existing PR workforce trends.

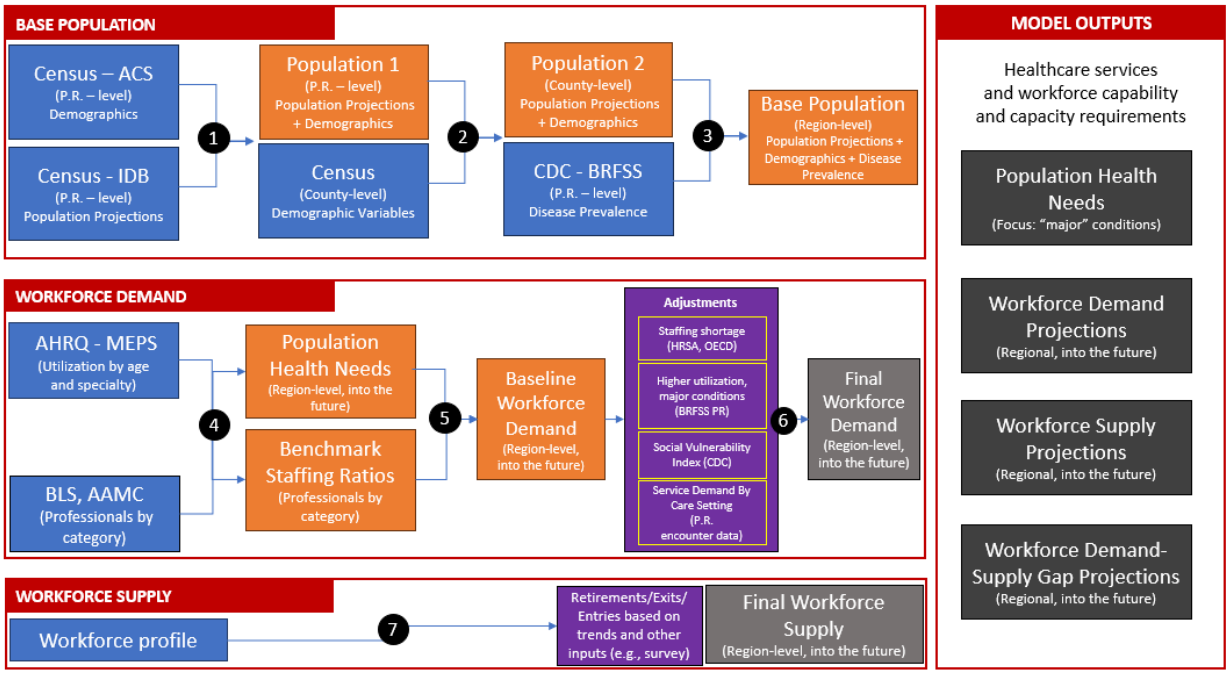
The workforce results in the report are based on the Target Workforce (Age-adjusted) demand scenario.

Workforce Supply

Puerto Rico healthcare workforce supply was derived from the Oficina de Reglamentación y Certificación de los Profesionales de la Salud (ORCPS), which identified the number of providers for 2024 by specialty. To project supply to 2050, historical provider linear growth rates between 2019-2022 and 2022-2024 were derived and incorporated into the supply calculations. The supply model also considered provider availability based on full-time equivalents (FTEs). In the model, each provider is assumed to be working at full capacity (i.e. 1 FTE). Given the minimal differences in daily patient volume and administrative workload

across specialties between the benchmark (i.e. continental US) and Puerto Rico, no adjustments were made to the projected FTEs.

Figure 4: Workforce Model Architecture



Model Outputs

The model produces four primary outputs: population health needs, workforce demand projections, workforce supply projections, and gap projections by physician specialty.

Population health needs: Population Health Needs outputs consist of prevalence of major conditions by health region. Conditions assessed include arthritis, asthma, cancer, chronic kidney disease (CKD), chronic obstructive pulmonary disease (COPD), depression, diabetes, high blood pressure (HBP), heart attack, heart disease, and stroke. Prevalence by conditions were projected to 2050.

Workforce demand projections: Health Workforce Demand, calculated using provider and population data, identify the number of providers needed to fully support the population based on continental US experience. Demand was derived by specialty and projected to 2050. Specialties assessed include Cardiology, Endocrinology, Gastroenterology, General/Family Practice, Geriatrics, Internal Medicine, Nephrology, Neurology, Nurse, OB/GYN, Oncology, Ophthalmology, Orthopedics, Pediatrics, Physical Therapy, Physician Assistant, Psychology and Psychiatry, Pulmonology, Rheumatology, Surgery, and Urology. The workforce results in the report are based on the 'Target Workforce (Age-adjusted)' demand scenario.

Workforce supply projections: Number of providers for 2024 was identified by specialty (ex: cardiology, internal medicine, etc.). To project supply to 2050, historical provider growth rates between 2019-2022 and 2022-2024 were derived. Linear supply growth rates were incorporated into the supply calculations. Supply by specialty was projected to 2050, by health region.

Workforce demand-supply gap projections: Health workforce gaps were calculated by simply subtracting the Health Workforce Demand from the Health Workforce Supply, by year, specialty, and region. Gaps were calculated up to 2050.

ID	Recommendation "Short Hand"	Description	Specific Findings Addressed by the Recommendation	Expected Benefits/Impacts	Key Parties and Roles
S1.1	Establish Effective Territory-Wide Workforce Development Program Coordination and Governance	Leverage the law that established the Centros Médicos Académicos Regionales (CMAR) to establish a coordination body for a Territory-Wide Workforce Development Program, a strategy for multi-level medical education that directly addresses and prioritizes healthcare practitioner needs identified in this study. Achieve the goals of increasing program capacity, sustaining these programs, and retaining graduates.	Puerto Rico needs to continue to develop more residency and fellowship programs to support filling gaps long term. Puerto Rico's medical education system reflects a fragmented operating structure; tight, or in some cases insufficient, budgets which inhibits support for existing or innovative medical education programs at universities, colleges, or teaching hospitals. It appears that medical education organizations (universities and teaching hospitals) are engaged in some degree of competition instead of collaborating to achieve common goals and objectives.	- Support a unified, territory-wide approach for medical education strategic planning and implementation of programs that have a positive impact on healthcare workforce development. - Develop a process or structure that maximizes Puerto Rico's medical education environment by improving collaboration and coordination of decisions related to existing programs. - Provide deep technical and programmatic expertise to medical education organizations to improve operating performance and funding, ideally to foster a more cohesive and inclusive medical education ecosystem. This could include both clinical and technological expertise development supports in multiple education and healthcare settings (e.g., schools, hospitals, clinics, physician offices, etc.). - Monitor short and long term progress toward achieving unified goals and objectives. - Establish a set of workforce impact measures that include access, staffing, workload and disease mitigation targeted outcomes and milestones enabling re-focus on certain initiatives as needed. - Identify potential opportunities for improving the use and potential expansion of existing funding across medical education programs. - Identify potential investment strategies for any newly allocated or additional funding that could have a positive impact on how medical education programs support future healthcare workforce outcomes. - Ensure effective capture, triage and pursuit of funding opportunities - a critical component of any effective workforce development coordination and governance system must be the early identification, rapid and complete triage, timely decision-making, and disciplined pursuit of funding opportunities for investments in workforce development programs. - Implement a system that guarantees licenses, insurance credentials, and a reliable source of income immediately after graduation.	- Department of Health - Regional Academic Medical Centers - Universities Managing Medical Education Programs
S2.1.1	Enhance Incentive Programs for Healthcare Professionals - Targeted Tax Incentives for Recruitment and Retention	Establish/refine tax incentive programs to prioritize key specialties and allied health professionals, particularly in underserved regions outside of metropolitan areas, and younger professionals with the goal of securing a long-term commitment to serving the population.	Incentives to healthcare providers should be carefully designed to increase patient access to care and participation in workforce training, particularly for underserved populations and areas. Incentives targeting key priority areas, such as rural healthcare, high need specialties, and night shift staffing, could help alleviate some of these workforce shortages and improve access to care across Puerto Rico. Healthcare workers in Puerto Rico, including nurses and allied health professionals, also face heavy workloads, often leading to burnout. Healthcare professionals in Puerto Rico are relocating for compensation reasons and: better access to quality education for their children, lower living costs, and an overall higher quality of life elsewhere.	- Retain Puerto Rico-based healthcare professionals - Attract professionals to relocate to Puerto Rico	- Governor's Office - Legislature - Department of Health - Department of Treasury

ID	Recommendation "Short Hand"	Description	Specific Findings Addressed by the Recommendation	Expected Benefits/Impacts	Key Parties and Roles

ID	Recommendation "Short Hand"	Description	Specific Findings Addressed by the Recommendation	Expected Benefits/Impacts	Key Parties and Roles
S2.1.2	Enhance Incentive Programs for Healthcare Professionals - Incentives for Returning Physicians	To attract physicians back to Puerto Rico, calibrate tax incentives so they are more substantial during their first five years of practice, supporting their efforts to establish new medical practices.	Incentives to healthcare providers should be carefully designed to increase patient access to care and participation in workforce training, particularly for underserved populations and areas. Incentives targeting key priority areas, such as rural healthcare, high need specialties, and night shift staffing, could help alleviate some of these workforce shortages and improve access to care across Puerto Rico. Healthcare workers in Puerto Rico, including nurses and allied health professionals, also face heavy workloads, often leading to burnout. Healthcare professionals in Puerto Rico are relocating for compensation reasons and: better access to quality education for their children, lower living costs, and an overall higher quality of life elsewhere.	- Retain Puerto Rico-based healthcare professionals - Attract professionals to relocate to Puerto Rico	- Governor's Office - Legislature - Department of Health - Department of Treasury
S2.1.3	Enhance Incentive Programs for Healthcare Professionals - Small Business Incentives for Medical Practices	Extend incentives such as small business loans or financial support to healthcare business owners. These incentives should be tied to employment growth and should not be age-restricted, as most physicians will likely become business owners later in their careers, typically after age 35.	Incentives to healthcare providers should be carefully designed to increase patient access to care and participation in workforce training, particularly for underserved populations and areas. Incentives targeting key priority areas, such as rural healthcare, high need specialties, and night shift staffing, could help alleviate some of these workforce shortages and improve access to care across Puerto Rico. Healthcare workers in Puerto Rico, including nurses and allied health professionals, also face heavy workloads, often leading to burnout. Healthcare professionals in Puerto Rico are relocating for compensation reasons and: better access to quality education for their children, lower living costs, and an overall higher quality of life elsewhere.	- Retain Puerto Rico-based healthcare professionals - Attract professionals to relocate to Puerto Rico	- Governor's Office - Legislature - Department of Health - Department of Economic Development and Commerce

ID	Recommendation "Short Hand"	Description	Specific Findings Addressed by the Recommendation	Expected Benefits/Impacts	Key Parties and Roles
S3.1	Modernize Healthcare Professional Licensing and Credentialing Processes and Systems	Modernize the systems used for maintaining and managing provider licensure and information; modernization may take the form of rearchitecting/replatforming the existing system or replacing it with a "commercial off-the-shelf" system that is more state-of-the-art. Eliminate the requirement that board member appointments have to be approved by the local legislature – historically the legislative approval requirement has reduced the number of resources interested in this role. An assessment of ORCPS regulations and procedures, as well as compliance requirements regarding licensure and education, should be an integral component of the modernization initiative.	Healthcare professionals in Puerto Rico are spending more time in administrative activities as their counterparts in the U.S. This excessive administrative burden contributes to inefficiencies, waste, burnout, and reduced time for patients. Licensing and credentialing processes are extremely bureaucratic and paper-intensive, routinely taking months to complete.	- Updated processes and systems in which the vast majority of licensing and credentialing processes can be handled electronically, including document submission and signatures. - reduce costs for both providers and health insurance companies, minimize the duplication of effort required of healthcare providers contracted with multiple insurers, and improve adherence with federal government agency would set up a centralized credentialing system that would facilitate credentialing for all health insurance companies and government agencies contracting with select healthcare practitioners (e.g. ASSMCA).	- Department of Health - Health insurance companies - Representatives from healthcare professional organizations
S3.2	Promote Policy and Procedure Harmonization and Simplification	Set up a working group to explore standardization of administrative processes and reduce burden on healthcare professionals - explore eliminating prior authorization and referral requirements for certain procedures, standardizing the collection and provision of provider network data, and requiring health insurance companies to engage in “quality improvement” initiatives, among others. Build requirements and/or incentives for administrative simplification into the GHP contracts and the next GHP procurement.	Healthcare professionals in Puerto Rico are spending more time in administrative activities as their counterparts in the U.S. This excessive administrative burden contributes to inefficiencies, waste, burnout, and reduced time for patients. Key informants and survey respondents noted an inability to project revenues due to complexities in payment policies across payers, further exacerbating financial instability.	- Reduce the cost and burden associated with the administrative side of healthcare. - More timely access to critical services. - Avoidance of duplicative, wasteful procedures.	- Health Insurance Administration - Health insurance companies - Organizations that represent healthcare professionals

ID	Recommendation "Short Hand"	Description	Specific Findings Addressed by the Recommendation	Expected Benefits/Impacts	Key Parties and Roles
S3.3	Support the Formation of More Resilient, Better Equipped Group Practices	In conjunction with the exploration and encouragement of coordinated care models, Puerto Rico should consider program design and provider reimbursement model changes that incentivize change in practice from sole practitioners to group practices with critical support staff such as nurse practitioners, physician assistants, therapists and dietitians.	For numerous reasons – administrative burden, ability to manage data and information systems, operating costs, and workforce retention, among others – the sole practitioner model is increasingly less viable in Puerto Rico.	- Achieve operational economies of scale. - Improve the ability to recruit and retain staff. - Deliver more coordinated care which benefits practitioners and patients.	- Health Insurance Administration - Health insurance companies - Representatives from healthcare professional organizations
S4.1.1	Implement Initiatives Focused on Improving Working Conditions for Healthcare Professionals - Life Supports	Implement tax incentives similar to those already implemented or proposed in the U.S. for offsetting child care and elder care costs, or an augmentation of federally-funded programs designed to subsidize the cost of these services.	Deteriorating working conditions which impacts retaining healthcare workforce and improving their ability to manage and deliver healthcare services effectively.	- Make it easier for healthcare professionals to access and cover the cost of these services. - Stimulate the availability of these services and the development of the requisite workforce. - Ensure that the availability of healthcare professionals is not compromised by their inability to access or cover the cost of family care services.	- Governor's Office - Legislature - Department of Family Services - Department of Treasury

ID	Recommendation "Short Hand"	Description	Specific Findings Addressed by the Recommendation	Expected Benefits/Impacts	Key Parties and Roles
S4.1.2	Implement Initiatives Focused on Improving Working Conditions for Healthcare Professionals - Infrastructure Improvement Fund	Establish an investment fund or loan support program to encourage the rehabilitation of healthcare facilities - these could be targeted at “small businesses” such as new physician practices.	Numerous concerns raised in the key informant interviews and surveys about the general state of healthcare facilities in Puerto Rico and the detrimental impact this has on working conditions, workforce satisfaction and retention, and facility-acquired conditions.	- Stimulate economic activity in municipalities where these funds are used to invest in rehabbed facilities. - Attraction of healthcare professionals to parts of Puerto Rico where shortages may be more acute. - Improved working conditions for professionals and improved environment where patients are receiving care.	- Governor's Office - Legislature - Department of Economic Development and Commerce - Municipalities
S5.1	Liberalize Telehealth Regulations to Enable Greater Availability of Telehealth Services	Puerto Rico should explore becoming part of the Interstate Medical Licensure Compact (IMLC), an agreement among multiple U.S. states to streamline the licensing process for physicians who wish to practice in multiple states. Established in 2013, the IMLC offers an expedited path for doctors to obtain medical licenses in participating states to improve healthcare access especially through telemedicine, and address physician shortages in underserved areas.	Numerous factors driving down availability of certain healthcare practitioners, including inability to tap into telehealth services and timely access to specialty care practitioners.	- Improve healthcare access especially through telemedicine. - Address physician shortages in underserved areas.	- Department of Health

ID	Recommendation "Short Hand"	Description	Specific Findings Addressed by the Recommendation	Expected Benefits/Impacts	Key Parties and Roles
S5.2	Test and Evaluate Specialist Care Practitioner Consult Programs	As a modality of telehealth that specifically targets a documented healthcare professional supply deficiency, which can include specialty care practitioners and subspecialists within a particular specialty (which may be in short supply in the U.S. as well), explore the viability and impact of an e-consult system under a structured demonstration project.	Numerous factors driving down availability of certain healthcare practitioners, including inability to tap into telehealth services and timely access to specialty care practitioners.	- Improve healthcare access especially through telemedicine, particularly for high-demand specialty care practitioners in extremely short supply. - Address physician shortages in underserved areas.	- Department of Health
S6.1.1	Engage in Targeted Investments in Healthcare Facilities and Related Infrastructure - Healthcare Facility Improvements	Invest in healthcare facility improvements with a particular focus on hospitals, including teaching hospitals. Specific investments can include upgrading existing facilities with modern medical equipment, medical and surgical technology, and improvements in cable plant infrastructure that enable high-speed communications within facilities and within a campus.	Investing in healthcare facility improvements is critical for the long-term growth and sustainability of Puerto Rico's healthcare system.	- Improve delivery of high-quality care within a facility. - Improve effectiveness of healthcare professional education. - Increase retention of healthcare professionals in Puerto Rico.	- Governor's Office - Legislature - Department of Health - Universities

ID	Recommendation "Short Hand"	Description	Specific Findings Addressed by the Recommendation	Expected Benefits/Impacts	Key Parties and Roles
S6.1.2	Engage in Targeted Investments in Healthcare Facilities and Related Infrastructure - Policy Support for Energy Costs	Implement energy cost-focused subsidies, tax incentives and/or provide financial incentives for going “off the grid”.	One of the major challenges highlighted by stakeholders is the escalating cost and stability of essential utilities, particularly electricity, which reportedly has been a factor in the closure of several hospitals.	- Ensure that hospitals, clinics and physician practices can operate without the growing financial burden of utility bills. - Ensure energy stability which is critical for care quality.	- Governor's Office - Legislature - Department of Health - Treasury Department
S6.1.3	Engage in Targeted Investments in Healthcare Facilities and Related Infrastructure - Investments in Broadband	Invest in broadband telecommunications infrastructure upgrades for healthcare facilities.	Investments in broadband were cited as vital for adopting new healthcare technologies, including telemedicine, electronic health records and artificial intelligence-powered applications.	- Enable adoption of new healthcare technologies including telemedicine, electronic health records and artificial intelligence-powered applications.	- Governor's Office - Legislature - Telecommunications companies

ID	Recommendation "Short Hand"	Description	Specific Findings Addressed by the Recommendation	Expected Benefits/Impacts	Key Parties and Roles
S6.2	Accelerate Establishment of Territory-Wide Health Information Exchange (HIE)	Prioritize and expedite the current effort by the Department of Health to procure and implement an HIE technical and operations solution.	Since 2010, Puerto Rico has had access to millions of dollars in federal funding for HIE planning, implementation and operations; despite that, multiple efforts have not resulted in a functioning territory-wide HIE. HIE is a capability which is often cited in the healthcare world as a critical component of "infrastructure" that has a direct bearing on practitioner productivity.	- Fewer duplicated procedures. - Improved patient safety through avoidance of certain procedures or prescriptions. - More timely access to more complete patient information for diagnostic and treatment decision making.	- Department of Health - Healthcare organizations using electronic health record (EHR) systems
S7.1	Promote Expanded Coverage of Non-Emergency Transportation Services Across All Health Coverage Programs	Expand the availability and coverage of these services, potentially through mandates and subsidies for enrollees in certain programs (e.g. GHP, Medicare Platino), targeted to older populations that would depend on them the most.	There is a need to bring healthcare services and practitioners closer to patients and to reduce the burden some patients face to reach practitioners. Up to 32 percent of older adults in Puerto Rico live alone, which is likely to correlate highly with transportation challenges, which in turn creates accessibility issues.	- More timely access to needed services, particularly preventive and condition management services. - Avoidance of complications and avoidable higher-cost services, including hospitalizations and services provided in emergency rooms, resulting from delayed care.	- Health Insurance Administration - Office of the Commissioner of Insurance - Centers for Medicare & Medicaid Services (CMS)

ID	Recommendation "Short Hand"	Description	Specific Findings Addressed by the Recommendation	Expected Benefits/Impacts	Key Parties and Roles
S7.2	Promote Expanded Coverage of At-Home Services, Including Services Designed to Address Social Risk Factors, across All Health Coverage Programs	Expand the availability and coverage of these services, potentially through mandates and subsidies for enrollees in certain programs (e.g. GHP, Medicare Platino). These services may include lab draws, post-operative and habilitative/rehabilitative therapy, prescription drug delivery, and coverage of services such as meal/grocery delivery that ensure that critical social risk factors are addressed proactively.	There is a need to bring healthcare services and practitioners closer to patients and to reduce the burden some patients face to reach practitioners. Up to 32 percent of older adults in Puerto Rico live alone, which is likely to correlate highly with transportation challenges, which in turn creates accessibility issues.	- More timely access to needed services, particularly preventive and condition management services. - Avoidance of complications and avoidable higher-cost services, including hospitalizations and services provided in emergency rooms, resulting from delayed care.	- Health Insurance Administration - Office of the Commissioner of Insurance - Centers for Medicare & Medicaid Services (CMS)
D1.1	Stimulate the Development of Long-Term and Home-and-Community-Based Services and Supports (LTSS/HCBS) - Increase Government Health Plan Coverage and Provide Investment Supports	Stimulate the establishment and development of entities: - Program for All-Inclusive Care for the Elderly (PACE) organizations - Skilled nursing facilities (SNFs) - Assisted living facilities (ALFs) - Intermediate care facilities for individuals with intellectual disabilities (ICF/IID) - Specialized memory care facilities - Continuing care retirement communities (CCRCs) - Community-based support services Provide limited GHP coverage of these services. Explore how LTSS/HCBS investments can be stimulated by aligning private investment – potentially coupled with local government incentives and supports - with the pent-up demand which surely exists from so many Puerto Rico working-age professionals living in the U.S. mainland with aging and disabled family members in Puerto Rico.	There are several potentially transformational changes to program/benefit design that, while somewhat dependent on increases in program funding, have the potential to both redirect utilization to more appropriate care settings and reduce costly, avoidable utilization that could also be palliative or even futile. The lack of LTSS/HCBS has a direct bearing on the availability of Puerto Rico's healthcare workforce.	- Elders and disabled individuals face many challenges and risks, including financial, social and health related risks, that can be addressed with the right mix and availability of LTSS/HCBS. - Stimulating LTSS/HCBS capacity development via the GHP should lead to self-pay demand further bolstering development. - (Ultimately) Avoidance of complications and avoidable higher-cost services, including hospitalizations and services provided in emergency rooms, resulting from delayed care.	- Governor's Office - Legislature - Department of Health - Department of Economic Development and Commerce - Centers for Medicare & Medicaid Services (CMS)

ID	Recommendation "Short Hand"	Description	Specific Findings Addressed by the Recommendation	Expected Benefits/Impacts	Key Parties and Roles
D1.2	Evaluate the Feasibility and Potential Impact of Implementing All-Payer Reimbursement Models for Certain Services	Explore and ultimately implement all-payer reimbursement harmonization for certain services or categories of service (precedent: Maryland All-Payer Model for hospitals)	Concerns regarding availability equity across health coverage programs for certain services, e.g. specialty care. Concerns regarding providers that rely more heavily on services rendered to enrollees in certain programs not being able to cover their costs.	- Alleviate accessibility challenges that clients of certain health coverage programs are experiencing. - Relieve financial pressure experienced by certain providers that rely more heavily on health coverage programs that reimburse less for certain services. - Achieve statistically significant impact on readmissions, emergency department visits, and hospital-acquired conditions.	- Health Insurance Administration - Office of the Commissioner of Insurance - Health insurance companies - Organizations that represent hospitals and healthcare practitioners
D2.1.1	Test and Evaluate the Potential Impact of Coordinated Care Models Focused on High-Cost, High-Need Populations - PACE (Program for All-Inclusive Care for the Elderly)	Evaluate the viability and impact of certain approaches to delivering care in a more coordinated, efficient, patient-centric manner; these coordinated care models are tailored to meet the needs of individuals with certain profiles/case presentations that typically fit a "high-need, high-cost" designation.	Lack of coordinated care that emphasizes prevention and wellness has a detrimental impact on service utilization, outcomes and quality of life and puts disproportionate pressure on the healthcare workforce.	- Improved coordination of services resulted in reduction in avoidable services. - Reduced cost of care, or reductions in the rate of growth of cost of care, within the in-scope population. - Improved health status and quality of life within the in-scope population.	- Department of Health - Health Insurance Administration - Centers for Medicare & Medicaid Services (CMS)

ID	Recommendation "Short Hand"	Description	Specific Findings Addressed by the Recommendation	Expected Benefits/Impacts	Key Parties and Roles
D2.1.2	Test and Evaluate the Potential Impact of Coordinated Care Models Focused on High-Cost, High-Need Populations - Blue Zones	Evaluate the viability and impact of certain approaches to delivering care in a more coordinated, efficient, patient-centric manner; these coordinated care models are tailored to meet the needs of individuals with certain profiles/case presentations that typically fit a "high-need, high-cost" designation.	Lack of coordinated care that emphasizes prevention and wellness has a detrimental impact on service utilization, outcomes and quality of life and puts disproportionate pressure on the healthcare workforce.	- Improved coordination of services resulted in reduction in avoidable services. - Reduced cost of care, or reductions in the rate of growth of cost of care, within the in-scope population. - Improved health status and quality of life within the in-scope population.	- Department of Health - Health Insurance Administration - Centers for Medicare & Medicaid Services (CMS)
D2.1.3	Test and Evaluate the Potential Impact of Coordinated Care Models Focused on High-Cost, High-Need Populations - Ornish Lifestyle Medicine Program	Evaluate the viability and impact of certain approaches to delivering care in a more coordinated, efficient, patient-centric manner; these coordinated care models are tailored to meet the needs of individuals with certain profiles/case presentations that typically fit a "high-need, high-cost" designation.	Lack of coordinated care that emphasizes prevention and wellness has a detrimental impact on service utilization, outcomes and quality of life and puts disproportionate pressure on the healthcare workforce.	- Improved coordination of services resulted in reduction in avoidable services. - Reduced cost of care, or reductions in the rate of growth of cost of care, within the in-scope population. - Improved health status and quality of life within the in-scope population.	- Department of Health - Health Insurance Administration - Centers for Medicare & Medicaid Services (CMS)

ID	Recommendation "Short Hand"	Description	Specific Findings Addressed by the Recommendation	Expected Benefits/Impacts	Key Parties and Roles
D2.1.4	Test and Evaluate the Potential Impact of Coordinated Care Models Focused on High-Cost, High-Need Populations - Centers for Disease Control and Prevention (CDC) Diabetes Prevention Program (DPP)	Evaluate the viability and impact of certain approaches to delivering care in a more coordinated, efficient, patient-centric manner; these coordinated care models are tailored to meet the needs of individuals with certain profiles/case presentations that typically fit a "high-need, high-cost" designation.	Lack of coordinated care that emphasizes prevention and wellness has a detrimental impact on service utilization, outcomes and quality of life and puts disproportionate pressure on the healthcare workforce.	- Improved coordination of services resulted in reduction in avoidable services. - Reduced cost of care, or reductions in the rate of growth of cost of care, within the in-scope population. - Improved health status and quality of life within the in-scope population.	- Department of Health - Health Insurance Administration - Centers for Medicare & Medicaid Services (CMS)
D2.1.5	Test and Evaluate the Potential Impact of Coordinated Care Models Focused on High-Cost, High-Need Populations - Wellness Opportunity Zones	Evaluate the viability and impact of certain approaches to delivering care in a more coordinated, efficient, patient-centric manner; these coordinated care models are tailored to meet the needs of individuals with certain profiles/case presentations that typically fit a "high-need, high-cost" designation.	Lack of coordinated care that emphasizes prevention and wellness has a detrimental impact on service utilization, outcomes and quality of life and puts disproportionate pressure on the healthcare workforce.	- Improved coordination of services resulted in reduction in avoidable services. - Reduced cost of care, or reductions in the rate of growth of cost of care, within the in-scope population. - Improved health status and quality of life within the in-scope population.	- Department of Health - Health Insurance Administration - Centers for Medicare & Medicaid Services (CMS)

ID	Recommendation "Short Hand"	Description	Specific Findings Addressed by the Recommendation	Expected Benefits/Impacts	Key Parties and Roles
D3.1	Evaluate the Viability and Potential Impact of Establishing a Health Insurance Exchange	We recommend an evaluation of the feasibility of establishing a health insurance exchange in Puerto Rico with a design that makes the most sense for Puerto Rico, leveraging the experience of states that have implemented different approaches to subsidizing health plan premiums, establishing "essential health benefits" that health plans must cover, and encouraging individuals, small businesses and associations to access the exchange.	Private health insurance enrollees are struggling with benefit reductions, rising cost of premiums, employers not offering healthcare benefits, and more limited access to services. There is concern that "crowd-out" – expansion of government-funded programs that leads to reductions in private health insurance offer and take-up - could trigger a "death spiral" in private health insurance markets. The redetermination of GHP enrollees following the end of the COVID-19 public health emergency, even after accounting for expansion of GHP eligibility, has the potential to increase the number of uninsured individuals in Puerto Rico which can increase financial pressures on certain providers, particularly hospitals, thus impacting the stability of the healthcare workforce.	- Provide more cost-effective, tailored coverage options for individuals with different priorities and conditions. - Prevent private health insurance "crowd-out". - Redirect federal Medicaid funds to purposes such as bolstering Puerto Rico's LTSS/HCBS infrastructure. - Prevent an increase in Puerto Rico's uninsured population, thus providing more reimbursement stability to certain providers - particularly hospitals - which in turn stabilizes the healthcare workforce these providers employ.	- Governor's Office - Legislature - Office of the Commissioner of Insurance - Health Insurance Administration
I.1	Establish an all-payer claims database (APCD)	Establish a multi-dimensional, territory-wide database that incorporates medical claims/encounters, pharmacy claims/encounters, dental claims/encounters, and eligibility/enrollment and provider data collected from all of the private and public payers operating in Puerto Rico.	Puerto Rico lacks robust healthcare workforce information management processes and systems based on our experience requesting and compiling complete, usable data from multiple sources for this study and compared to the information management processes and systems in place in many U.S. states.	- Fortify the information infrastructure required to maintain, optimize the utilization, and preserve the value of the work products created and delivered to the FOMB as part of the study. - Provide reliable, complete data assets for other organizations to use when conducted healthcare-related research and analysis. - Build the capability to assess the effectiveness/impact of healthcare workforce development initiatives.	- Department of Health - Health Insurance Administration - Office of the Commissioner of Insurance - (Possibly) Universities

ID	Recommendation "Short Hand"	Description	Specific Findings Addressed by the Recommendation	Expected Benefits/Impacts	Key Parties and Roles
I.2	Establish a healthcare professional information hub	Establish a multi-dimensional database where current and historical information about healthcare professionals is maintained and available for multiple research and analysis purposes. This could be a module/extension of the APCD or its own information management system.	Puerto Rico lacks robust healthcare workforce information management processes and systems based on our experience requesting and compiling complete, usable data from multiple sources for this study and compared to the information management processes and systems in place in many U.S. states.	- Fortify the information infrastructure required to maintain, optimize the utilization, and preserve the value of the work products created and delivered to the FOMB as part of the study. - Provide reliable, complete data assets for other organizations to use when conducted healthcare-related research and analysis. - Build the capability to assess the effectiveness/impact of healthcare workforce development initiatives.	- Department of Health - Health Insurance Administration - Office of the Commissioner of Insurance - (Possibly) Universities
I.3	Establish a Community Health Dashboard	Establish an information management system designed to generate visualizations of data related to health disparities and inequities across different population groups. This data management solution aggregates health outcomes, social determinants of health (e.g., income, education, housing), and healthcare access metrics to identify gaps and monitor progress toward achieving equity in delivery and outcomes.	Puerto Rico lacks robust healthcare workforce information management processes and systems based on our experience requesting and compiling complete, usable data from multiple sources for this study and compared to the information management processes and systems in place in many U.S. states.	- Fortify the information infrastructure required to maintain, optimize the utilization, and preserve the value of the work products created and delivered to the FOMB as part of the study. - Provide reliable, complete data assets for other organizations to use when conducted healthcare-related research and analysis. - Build the capability to assess the effectiveness/impact of healthcare workforce development initiatives.	- Department of Health - (Possibly) Universities

ID	Recommendation "Short Hand"	Description	Specific Findings Addressed by the Recommendation	Expected Benefits/Impacts	Key Parties and Roles
I.4	Establish a Healthcare Workforce Funding Opportunity Clearinghouse	Establish a unit within the Government of Puerto Rico structure be charged with maintaining continuous surveillance, and ideally researching and outreaching to receive early notice, on federal funding opportunities tied to healthcare workforce development. This unit would serve as a clearinghouse of these opportunities – capture, profile, and provide all available intelligence about the opportunities to enable the appropriate entity (e.g. the previously recommended healthcare workforce development program coordinating body) or government agency (e.g. DOH, ASSMCA, UPR) that can subsequently determine whether and how to pursue the opportunities.	Concerns about the ability to successfully pursue federal funding opportunities for healthcare workforce development.	- Ensure federal funding opportunities for healthcare workforce development are not missed and successfully pursued.	- Governor's Office - Department of Health
I.5	Assess the Capabilities of Certain Government Entities to Successfully Manage Healthcare Workforce Funding Awards	Conduct a capability assessment of the organizations responsible for pursuing and submitting complete, successful applications or proposals for healthcare workforce development funds and, thereafter, to manage the awarded funds including compliance, reporting and program evaluation requirements.	Concerns about the ability to successfully pursue federal funding opportunities for healthcare workforce development. Concerns about the ability to successfully manage and demonstrate the impact of federal funding awards for healthcare workforce development.	- Ensure federal funding opportunities for healthcare workforce development are successfully pursued and yield the desired benefits/impacts.	- Governor's Office - Department of Health

			RECOMMENDATION PROPERTIES				RECOMMENDATION CATEGORIZATION *Based on expected benefits/impacts*											
							Impact on Workforce Supply Optimization Drivers?							Impact on Workforce Demand Optimization Drivers?			Workforce Information and Info Mgt Processes and Systems		
ID	Recommendation "Short Hand"	Description	Conclusiveness	Funding?	Changes to Laws/Regs?	Timing/ Sequence	Pipeline	Retention	Admin Burden	Working Conditions	Availability	Capacity	Accessibility	Program/ Benefit Design	Incentives - Financial and Other	Healthcare Infrastructure	Information	Info Mgt Processes	Info Mgt Systems
S1.1	Establish Effective Territory-Wide Workforce Development Program Coordination and Governance	Leverage the law that established the Centros Médicos Académicos Regionales (CMAR) to establish a coordination body for a Territory-Wide Workforce Development Program, a strategy for multi-level medical education that directly addresses and prioritizes healthcare practitioner needs identified in this study. Achieve the goals of increasing program capacity, sustaining these programs, and retaining graduates.	▲	▬	▬	▲	✓	✓											
S2.1.1	Enhance Incentive Programs for Healthcare Professionals - Targeted Tax Incentives for Recruitment and Retention	Establish/refine tax incentive programs to prioritize key specialties and allied health professionals, particularly in underserved regions outside of metropolitan areas, and younger professionals with the goal of securing a long-term commitment to serving the population.	▲	▼	▼	▲	✓	✓		✓									

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S2.1.2	Enhance Incentive Programs for Healthcare Professionals - Incentives for Returning Physicians	To attract physicians back to Puerto Rico, calibrate tax incentives so they are more substantial during their first five years of practice, supporting their efforts to establish new medical practices.	▲	▼	▼	▲	✓	✓		✓									
S2.1.3	Enhance Incentive Programs for Healthcare Professionals - Small Business Incentives for Medical Practices	Extend incentives such as small business loans or financial support to healthcare business owners. These incentives should be tied to employment growth and should not be age-restricted, as most physicians will likely become business owners later in their careers, typically after age 35.	▲	▼	▼	▲	✓	✓		✓									

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S3.1	Modernize Healthcare Professional Licensing and Credentialing Processes and Systems	Modernize the systems used for maintaining and managing provider licensure and information; modernization may take the form of rearchitecting/replatforming the existing system or replacing it with a "commercial off-the-shelf" system that is more state-of-the-art. Eliminate the requirement that board member appointments have to be approved by the local legislature – historically the legislative approval requirement has reduced the number of resources interested in this role. An assessment of ORCPS regulations and procedures, as well as compliance requirements regarding licensure and education, should be an integral component of the modernization initiative.	▲	▼	–	▲		✓	✓										
S3.2	Promote Policy and Procedure Harmonization and Simplification	Set up a working group to explore standardization of administrative processes and reduce burden on healthcare professionals - explore eliminating prior authorization and referral requirements for certain procedures, standardizing the collection and provision of provider network data, and requiring health insurance companies to engage in "quality improvement" initiatives, among others. Build requirements and/or incentives for administrative simplification into the GHP contracts and the next GHP procurement.	▲	▲	▲	▲			✓										

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S3.3	Support the Formation of More Resilient, Better Equipped Group Practices	In conjunction with the exploration and encouragement of coordinated care models, Puerto Rico should consider program design and provider reimbursement model changes that incentivize change in practice from sole practitioners to group practices with critical support staff such as nurse practitioners, physician assistants, therapists and dietitians.	–	–	–	–	✓		✓		✓	✓							
S4.1.1	Implement Initiatives Focused on Improving Working Conditions for Healthcare Professionals - Life Supports	Implement tax incentives similar to those already implemented or proposed in the U.S. for offsetting child care and elder care costs, or an augmentation of federally-funded programs designed to subsidize the cost of these services.	▲	▼	▼	▲		✓		✓	✓								

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S4.1.2	Implement Initiatives Focused on Improving Working Conditions for Healthcare Professionals - Infrastructure Improvement Fund	Establish an investment fund or loan support program to encourage the rehabilitation of healthcare facilities - these could be targeted at “small businesses” such as new physician practices.	▲	▼	▼	▲		✓		✓	✓								
S5.1	Liberalize Telehealth Regulations to Enable Greater Availability of Telehealth Services	Puerto Rico should explore becoming part of the Interstate Medical Licensure Compact (IMLC), an agreement among multiple U.S. states to streamline the licensing process for physicians who wish to practice in multiple states. Established in 2013, the IMLC offers an expedited path for doctors to obtain medical licenses in participating states to improve healthcare access especially through telemedicine, and address physician shortages in underserved areas.	▲	▲	▼	▲					✓	✓	✓						

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S5.2	Test and Evaluate Specialist Care Practitioner Consult Programs	As a modality of telehealth that specifically targets a documented healthcare professional supply deficiency, which can include specialty care practitioners and subspecialists within a particular specialty (which may be in short supply in the U.S. as well), explore the viability and impact of an e-consult system under a structured demonstration project.	–	–	▼	–					✓	✓	✓						
S6.1.1	Engage in Targeted Investments in Healthcare Facilities and Related Infrastructure - Healthcare Facility Improvements	Invest in healthcare facility improvements with a particular focus on hospitals, including teaching hospitals. Specific investments can include upgrading existing facilities with modern medical equipment, medical and surgical technology, and improvements in cable plant infrastructure that enable high-speed communications within facilities and within a campus.	▲	▼	–	–				✓		✓	✓			✓			

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S6.1.2	Engage in Targeted Investments in Healthcare Facilities and Related Infrastructure - Policy Support for Energy Costs	Implement energy cost-focused subsidies, tax incentives and/or provide financial incentives for going “off the grid”.	▲	▼	–	–				✓		✓	✓			✓			
S6.1.3	Engage in Targeted Investments in Healthcare Facilities and Related Infrastructure - Investments in Broadband	Invest in broadband telecommunications infrastructure upgrades for healthcare facilities.	▲	▼	–	–				✓		✓	✓			✓			

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S6.2	Accelerate Establishment of Territory-Wide Health Information Exchange (HIE)	Prioritize and expedite the current effort by the Department of Health to procure and implement an HIE technical and operations solution.	▲	▬	▲	▬			✓			✓				✓			
S7.1	Promote Expanded Coverage of Non-Emergency Transportation Services Across All Health Coverage Programs	Expand the availability and coverage of these services, potentially through mandates and subsidies for enrollees in certain programs (e.g. GHP, Medicare Platino), targeted to older populations that would depend on them the most.	▲	▬	▬	▲	✓						✓	✓		✓			

			RECOMMENDATION PROPERTIES				RECOMMENDATION CATEGORIZATION *Based on expected benefits/impacts*											
							Impact on Workforce Supply Optimization Drivers?							Impact on Workforce Demand Optimization Drivers?			Workforce Information and Info Mgt Processes and Systems		
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S7.2	Promote Expanded Coverage of At-Home Services, Including Services Designed to Address Social Risk Factors, across All Health Coverage Programs	Expand the availability and coverage of these services, potentially through mandates and subsidies for enrollees in certain programs (e.g. GHP, Medicare Platino). These services may include lab draws, post-operative and habilitative/rehabilitative therapy, prescription drug delivery, and coverage of services such as meal/grocery delivery that ensure that critical social risk factors are addressed proactively.	▲	–	–	▲	✓						✓	✓		✓			
D1.1	Stimulate the Development of Long-Term and Home-and-Community-Based Services and Supports (LTSS/HCBS) - Increase Government Health Plan Coverage and Provide Investment Supports	Stimulate the establishment and development of entities: - Program for All-Inclusive Care for the Elderly (PACE) organizations - Skilled nursing facilities (SNFs) - Assisted living facilities (ALFs) - Intermediate care facilities for individuals with intellectual disabilities (ICF/IID) - Specialized memory care facilities - Continuing care retirement communities (CCRCs) - Community-based support services Provide limited GHP coverage of these services. Explore how LTSS/HCBS investments can be stimulated by aligning private investment – potentially coupled with local government incentives and supports - with the pent-up demand which surely exists from so many Puerto Rico working-age professionals living in the U.S. mainland with aging and disabled family members in Puerto Rico.	▲	▼	–	▲	✓					✓	✓	✓		✓			

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D1.2	Evaluate the Feasibility and Potential Impact of Implementing All-Payer Reimbursement Models for Certain Services	Explore and ultimately implement all-payer reimbursement harmonization for certain services or categories of service (precedent: Maryland All-Payer Model for hospitals)	–	–	–	–								✓	✓				
D2.1.1	Test and Evaluate the Potential Impact of Coordinated Care Models Focused on High-Cost, High-Need Populations - PACE (Program for All-Inclusive Care for the Elderly)	Evaluate the viability and impact of certain approaches to delivering care in a more coordinated, efficient, patient-centric manner; these coordinated care models are tailored to meet the needs of individuals with certain profiles/case presentations that typically fit a "high-need, high-cost" designation.	–	–	–	–					✓	✓	✓	✓	✓				

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D2.1.2	Test and Evaluate the Potential Impact of Coordinated Care Models Focused on High-Cost, High-Need Populations - Blue Zones	Evaluate the viability and impact of certain approaches to delivering care in a more coordinated, efficient, patient-centric manner; these coordinated care models are tailored to meet the needs of individuals with certain profiles/case presentations that typically fit a "high-need, high-cost" designation.	–	–	–	–					✓	✓	✓	✓	✓				
D2.1.3	Test and Evaluate the Potential Impact of Coordinated Care Models Focused on High-Cost, High-Need Populations - Ornish Lifestyle Medicine Program	Evaluate the viability and impact of certain approaches to delivering care in a more coordinated, efficient, patient-centric manner; these coordinated care models are tailored to meet the needs of individuals with certain profiles/case presentations that typically fit a "high-need, high-cost" designation.	–	–	–	–					✓	✓	✓	✓	✓				

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D2.1.4	Test and Evaluate the Potential Impact of Coordinated Care Models Focused on High-Cost, High-Need Populations - Centers for Disease Control and Prevention (CDC) Diabetes Prevention Program (DPP)	Evaluate the viability and impact of certain approaches to delivering care in a more coordinated, efficient, patient-centric manner; these coordinated care models are tailored to meet the needs of individuals with certain profiles/case presentations that typically fit a "high-need, high-cost" designation.	–	–	–	–					✓	✓	✓	✓	✓				
D2.1.5	Test and Evaluate the Potential Impact of Coordinated Care Models Focused on High-Cost, High-Need Populations - Wellness Opportunity Zones	Evaluate the viability and impact of certain approaches to delivering care in a more coordinated, efficient, patient-centric manner; these coordinated care models are tailored to meet the needs of individuals with certain profiles/case presentations that typically fit a "high-need, high-cost" designation.	–	–	–	–					✓	✓	✓	✓	✓				

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D3.1	Evaluate the Viability and Potential Impact of Establishing a Health Insurance Exchange	We recommend an evaluation of the feasibility of establishing a health insurance exchange in Puerto Rico with a design that makes the most sense for Puerto Rico, leveraging the experience of states that have implemented different approaches to subsidizing health plan premiums, establishing "essential health benefits" that health plans must cover, and encouraging individuals, small businesses and associations to access the exchange.	▲	▼	▼	▲		✓						✓	✓				
I.1	Establish an all-payer claims database (APCD)	Establish a multi-dimensional, territory-wide database that incorporates medical claims/encounters, pharmacy claims/encounters, dental claims/encounters, and eligibility/enrollment and provider data collected from all of the private and public payers operating in Puerto Rico.	▲	▬	▼	▬											✓	✓	✓

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I.2	Establish a healthcare professional information hub	Establish a multi-dimensional database where current and historical information about healthcare professionals is maintained and available for multiple research and analysis purposes. This could be a module/extension of the APCD or its own information management system.	▲	–	▼	–											✓	✓	✓
I.3	Establish a Community Health Dashboard	Establish an information management system designed to generate visualizations of data related to health disparities and inequities across different population groups. This data management solution aggregates health outcomes, social determinants of health (e.g., income, education, housing), and healthcare access metrics to identify gaps and monitor progress toward achieving equity in delivery and outcomes.	▲	–	▼	–											✓	✓	✓

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I.4	Establish a Healthcare Workforce Funding Opportunity Clearinghouse	Establish a unit within the Government of Puerto Rico structure be charged with maintaining continuous surveillance, and ideally researching and outreaching to receive early notice, on federal funding opportunities tied to healthcare workforce development. This unit would serve as a clearinghouse of these opportunities – capture, profile, and provide all available intelligence about the opportunities to enable the appropriate entity (e.g. the previously recommended healthcare workforce development program coordinating body) or government agency (e.g. DOH, ASSMCA, UPR) that can subsequently determine whether and how to pursue the opportunities.	▲	▲	▲	▲											✓	✓	
I.5	Assess the Capabilities of Certain Government Entities to Successfully Manage Healthcare Workforce Funding Awards	Conduct a capability assessment of the organizations responsible for pursuing and submitting complete, successful applications or proposals for healthcare workforce development funds and, thereafter, to manage the awarded funds including compliance, reporting and program evaluation requirements.	▲	▲	▲	▲											✓	✓	