

RESEARCH REPORT

# Environmental Scan of Puerto Rico's Health Care Infrastructure

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# Contents

<b>Acknowledgments</b>	<b>iv</b>
<b>Environmental Scan of Puerto Rico's Health Care Infrastructure</b>	<b>1</b>
Purpose	2
Methods	3
Findings	4
Puerto Rico's Health Care System	5
Health Concerns in Puerto Rico	6
Cost and Payment Environment	9
Structural Access to Care	16
Quality of Care	22
Health Care Infrastructure	23
Conclusion	31
<b>Notes</b>	<b>33</b>
<b>References</b>	<b>38</b>
<b>About the Authors</b>	<b>43</b>
<b>Statement of Independence</b>	<b>44</b>

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# Environmental Scan of Puerto Rico's Health Care Infrastructure

Approximately 3.5 million people (24 percent of them under age 18) live in the Commonwealth of Puerto Rico (Cohn, Patten, and Lopez 2014; US Census Bureau 2015a). The archipelago of Puerto Rico includes the main island and six smaller islands, comprising 78 municipalities in all. The vast majority of the population lives on the main island of Puerto Rico; the only other inhabited islands, Vieques and Culebra, are home to approximately 9,301 and 1,818 residents respectively (PRBLS 2014b). On the main island, about 31.5 percent of the population lives in the municipality of San Juan or in one of its neighboring municipalities, Bayamón, Caguas, Carolina, Guaynabo, Toa Alta, and Toa Baja (Cohn, Patten, and Lopez 2014). The rest of Puerto Rico's population lives primarily along the coasts (Arecibo, Mayagüez, Ponce), with only a small percentage (18.5 percent) living in the forested and mountainous interior (Cohn, Patten, and Lopez 2014).

Even after the Great Recession ended on the US mainland, its effects could still be felt in Puerto Rico. For over a decade, Puerto Rico has been in the midst of a significant economic decline. Between 2005 and 2010, the real gross domestic product (GDP) of Puerto Rico fell by nearly \$6 billion, from \$112 billion to \$106 billion. As of 2014, Puerto Rico had a real GDP of \$103.1 billion, and its economy hinged on three major industrial sectors: manufacturing (46.5 percent of GDP), services (41.6 percent), and government (8.0 percent). The decline in Puerto Rico's GDP has been accompanied by a 9 percent decline in labor force participation (1.29 million in 2010 to 1.18 million in 2014) and a 7 percent decline in employment (1.08 million in 2010 to 1.01 million in 2014; PRBLS 2014b). The unemployment rate in Puerto Rico (14 percent in 2014) has consistently outstripped the unemployment rate on the US mainland (6.2 percent in 2014; BLS 2016; PRBLS 2014b). In 2014, Puerto Rico's median household income was low (\$19,686 compared with \$53,482) and its poverty rate high (41 percent compared with 12 percent of people with incomes below the federal poverty level [FPL]) relative to the US mainland; (US Census Bureau 2014b).

The ongoing economic decline of Puerto Rico has been exacerbated by the commonwealth government's debt burden (Federal Reserve Bank of New York 2012, 2014; Krueger, Teja, and Wolfe 2015). Puerto Rico currently has \$72 billion in debt and, unlike any US state government, cannot authorize its municipalities and public corporations to declare bankruptcy as a means of restructuring its debt.<sup>1</sup> To make matters worse, the 2014 downgrade of the commonwealth's debt has raised Puerto Rico's borrowing costs and virtually cut it off from capital markets (Federal Reserve Bank of New York

2014; Krueger, Teja, and Wolfe 2015). In an effort to address its high public debt, the commonwealth has taken substantial steps to increase tax revenue and reduce government expenditures.<sup>2</sup> However, establishing a path to debt sustainability in an environment with low economic growth has proven challenging; Puerto Rico has been unable to make principal and interest payments on its municipal bond debt. In July 2016, it defaulted on \$911 million in payments due.<sup>3</sup> This debt burden limits the Puerto Rican government's ability to invest in infrastructure and in the health and education of its residents, and to restore economic growth (Collins, Bosworth, and Soto-Class 2006).

As the fortunes of the Puerto Rican economy have ebbed and flowed, Puerto Ricans have continued to migrate to the US mainland. The largest wave of Puerto Rican emigration, known as the Great Migration, occurred between 1946 and 1960, when 605,450 Puerto Ricans—an average of 40,000 a year—left the islands to settle on the US mainland (Ayala 1996). The current emigration flows now exceed those of the Great Migration. In 2014, nearly 84,000 people left Puerto Rico while only 20,000 returned, resulting in a net population loss of 64,000 (Velázquez-Estrada 2016). This population decline has continued, with a net population loss of 61,000 in 2015, and amounts to a 6.8 percent decline (251,000 residents) in the population from 2010 to 2015 (US Census Bureau 2015b, 2015c).

These emigration flows have been distributed unevenly across the population, leading to a substantial decline in the educated and working-age (ages 20 to 65) population within Puerto Rico. The average person leaving Puerto Rico is 29 years old, younger than those staying in or immigrating to Puerto Rico. The majority of emigrants are men (53 percent), speak English well or very well (65 percent), have graduated high school (75 percent), and live above the poverty level (58 percent). In 2014, this exodus of young educated Puerto Ricans resulted in a net loss of 16,670 people with postsecondary education, including an estimated 2,132 health professionals (Velázquez-Estrada 2016). With the number of health care practitioners and technical occupations in Puerto Rico in that year totaling 51,740, this migration amounts to about a 4 percent reduction in Puerto Rico's health care workforce (BLS 2015b).

## Purpose

The economic decline in Puerto Rico and the concomitant increase in health care worker emigration have the potential to undermine Puerto Rico's health care infrastructure and negatively impact the health of Puerto Rico's population. This report, drawing primarily from available publications, aims to provide an objective assessment of Puerto Rico's health care infrastructure. We begin with a brief

overview of Puerto Rico's health care system and the health of Puerto Rico's population. We then discuss Puerto Rico's cost and payment environment and the literature on access to and quality of health care in Puerto Rico. We conclude with a summary assessment of Puerto Rico's health care infrastructure to provide context for future policies that may be implemented to improve the health of Puerto Ricans.

## Methods

To assess the status of Puerto Rico's health care infrastructure, our research team conducted an environmental scan of publicly available literature, government reports, and media sources. We supplemented information obtained through the environmental scan with interview data collected during a site visit to Puerto Rico in October 2016 and reports and other materials provided by site visit informants.

To complete the environmental scan, we used a systematic approach to identifying and synthesizing current literature regarding Puerto Rico's health care system, the health of Puerto Rico's population, and access and quality of care. We also examined existing research about barriers to receiving high-quality care in Puerto Rico, including its cost and payment environment and health care infrastructure. Our scan included peer-reviewed literature, gray literature (e.g., government reports and industry reports), and media sources.<sup>4</sup>

First, we developed a general outline to capture the key issues affecting Puerto Rico's health care system, including population and economic issues (e.g., migration and provider supply), health concerns (e.g., infectious diseases and common chronic conditions), access to care (also related to provider supply), quality of care, and health care infrastructure. This outline was approved by the Office of the Assistant Secretary for Planning and Evaluation of the US Department of Health and Human Services and used to structure the literature search and the development of the literature review abstraction form.

We developed search terms based on the outline and applied them to the databases EBSCO Host, PubMed, and Google Scholar to identify relevant peer-reviewed articles, key reports, and news articles. The team also reviewed key US and Puerto Rican government websites (e.g., el Departamento de Salud for Puerto Rico and the US Congressional Research Service) for reports on the population, economy, and health status. We limited our search to reports and articles from the last three years, with the exception of some older seminal pieces of literature.

During the site visit, we met with 25 people from 16 different entities located within the San Juan metropolitan area of Puerto Rico. We spoke with representatives of the Office of the Governor of Puerto Rico, managed care organizations, and the Puerto Rico Health Insurance Administration, in addition to federally qualified health center (FQHC) physicians and administrators, physicians directing independent physician associations (IPAs), pharmacists, medical educators, hospital providers, and researchers spearheading efforts to provide data on demographic changes and the health needs of Puerto Ricans. Additionally we spoke with officials in the Center for Medicare and Medicaid Services (CMS) who have worked with Puerto Rico's Medicare and Medicaid programs. Many of the people we interviewed served in multiple capacities; they were practicing physicians, dentists, and pharmacists who also organized provider associations, spearheaded advocacy groups, and directed medical programs. Given the limited time provided for our site visit, we were not able to meet with patient groups to discuss their experiences accessing health care in Puerto Rico or with patients or providers working outside of the San Juan metropolitan area.

Interviews focused on four broad areas: (1) economic and social conditions affecting the Puerto Rican health care system, (2) federal and commonwealth policies affecting the Puerto Rican health care system, (3) barriers to health and health care services in Puerto Rico, and (4) promising strategies to overcome such barriers.

In the following sections, we summarize key insights from the literature review and site visit interviews.

## Findings

In this section, we first provide an overview of Puerto Rico's health care system and describe population health concerns. We then discuss the commonwealth's cost and payment environment, including Medicaid, Medicare, and private health insurance, noting differences from the US mainland and selected states where appropriate. Because Puerto Rico is different from the US mainland in many respects (e.g., average income), we also included comparisons with Florida and Mississippi, states which are similar to Puerto Rico in certain dimensions. The section concludes with a review of evidence on access to and quality of care, and how these relate to provider supply and other aspects of Puerto Rico's health care infrastructure.



## Puerto Rico's Health Care System

Since the 1950s, Puerto Rico has had a mixed public-private health care system. Historically, the private sector consisted of 56 hospitals and numerous ambulatory care facilities that served citizens covered by self-funded or employer-provided health insurance (PAHO 2007). The public health sector, managed by the Health Facilities and Service Administration of Puerto Rico (Administración de Facilidades y Servicios de Salud, or AFASS) provided care to those without insurance through a regional health care system, wherein primary health care services were provided in municipal diagnostic and treatment centers, secondary health care services were provided in regional and subregional hospitals, and more specialized tertiary services were available at the supraregional Río Piedras Medical Center located in San Juan (Arbona and Ramírez de Arellano 1978).<sup>5</sup> In this system, public health care services were both financed and administered by the Commonwealth of Puerto Rico.

In 1993, Puerto Rico began the process of privatizing its public health care systems (PAHO 2007; Portela and Sommers 2015; Santos-Lozada 2012). Reform goals included reducing disparities in access to primary and specialty physicians, improving consumer choice, reducing bureaucracy, and controlling costs (Portela and Sommers 2015). By instituting a form of managed competition, the new system (called *la Reforma*) allowed diagnostic and treatment centers as well as regional hospitals to privatize, and established the Puerto Rico Health Insurance Administration (Administración de Seguros de Salud de Puerto Rico, or ASES). As part of *la Reforma*, the commonwealth no longer assumed responsibility for providing health care to the medically indigent through publicly owned facilities. Instead, ASES assumed responsibility for contracting with commercial insurance companies to manage the care of the medically indigent. However, several problems arose alongside the 1993 reforms (Comisión 2005; Santos-Lozada 2012). As the government sold its diagnostic and treatment centers to private medical groups and nonprofit corporations, 20 of Puerto Rico's 78 municipalities stopped providing 24/7 emergency services, forcing the government to contract with third parties to fill that gap (PAHO 2007). Between 2001 and 2003, new reforms (called *la Reforma de la Reforma*) were implemented to protect patients' rights, to allow ASES to directly contract with health care providers, and to prohibit further privatization of municipal diagnostic and treatment centers (PAHO 2007).

Currently, Puerto Rico's Department of Health (Departamento de Salud, or DS) has primary responsibility for the management of all public health programs and services in Puerto Rico, including the management of the commonwealth's municipal diagnostic and treatment centers and public hospitals (PAHO 2007). Through a cooperative agreement with DS, ASES maintains responsibility for administering public health insurance offered through Mi Salud (My Health), the commonwealth's federally funded Medicaid program; Children's Health Insurance Program (CHIP); Medicare Platino;

and coverage for the medically indigent funded by Puerto Rico only (Mach et al. 2016; Portela and Sommers 2015).<sup>6</sup> All public employees also receive their insurance through Mi Salud.

Both DS and ASES organize their services into geographic regions: East/Mayagüez-Aguadilla, Northeast/Arecibo, Southeast-Southwest/Ponce, West/Caguas, Northwest/Fajardo-Vieques-Culebra, Southwest/Bayamón, and North-San Juan/Metro. However, the municipalities within these DS and ASES regions do not match perfectly.<sup>7</sup>

As Puerto Rico's economy has faltered and its population has declined, total public and private health care expenditures have decreased 10 percent, from \$12.1 billion in 2010 to \$10.9 billion in 2014. Per capita, total health expenditures for the commonwealth's population have declined 5 percent, from \$3,240 in 2010 to \$3,065 in 2014. As of 2014, the health sector made up approximately 10.5 percent of Puerto Rico's GDP (Departamento de Salud 2015b). On the US mainland, per capita health expenditures were \$9,403 and amounted to approximately 17.1 percent of GDP in 2014.<sup>8</sup> However, it is not clear how much of this difference reflects variation in prices versus utilization and how much reflects insufficient spending on nursing facilities (for more information on Puerto Rico's nursing facility infrastructure, see the Cost and Payment Environment section).

## Health Concerns in Puerto Rico

Although per capita health expenditures are lower in Puerto Rico (PR) than on the US mainland,<sup>9</sup> Puerto Ricans and US mainland residents have similar life expectancies (79.25 years in PR versus 79.68 years in the United States, in 2015; Departamento de Salud 2015b; Xu et al. 2016). However, Puerto Rico has a higher infant mortality rate (7.57 per 1000 in 2015) than the US mainland (5.87 per 1000 in 2015) and a premature birth rate well above the average for the US mainland (11.8 percent in PR versus 9.6 percent in the United States).<sup>10</sup>

Overall, the Puerto Rican population is aging. The median age of the Puerto Rican population increased from 36 in 2010 to 39 in 2015 (US Census Bureau 2010, 2015a). Eighteen percent of Puerto Rico's population is now over age 65, compared with 14.9 percent of the population on the US mainland (US Census Bureau 2015a).

The primary causes of death in Puerto Rico reflect the commonwealth's aging population. According to 2013 data, primary causes of death included cancer, diseases of the heart, diabetes, Alzheimer's disease, and cerebrovascular diseases (table 1; Departamento de Salud 2015b). By comparison, the top five causes of death on the US mainland were diseases of the heart, cancer, chronic

respiratory diseases, unintentional injuries, and cerebrovascular diseases. The second and third most common causes of death in Puerto Rico, diabetes and Alzheimer’s disease, were slightly lower in the US mainland rankings, where they ranked sixth and seventh respectively in 2013 (23.9 per 100,000 and 26.8 per 100,000; Xu et al. 2016).

TABLE 1

**Primary Causes of Death in Puerto Rico and the US Mainland, 2013**

Puerto Rico			US Mainland		
Rank	Cause of death	Rate per 100,000	Rank	Cause of death	Rate per 100,000
1	Cancer	144.4	1	Diseases of the heart	193.3
2	Diseases of the heart	140.7	2	Cancer	185.0
3	Diabetes	87.0	3	Chronic respiratory disease	47.2
4	Alzheimer’s disease	50.6	4	Unintentional injuries	41.3
5	Cerebrovascular disease	37.4	5	Cerebrovascular disease	40.8

Sources: Departamento de Salud 2015b; Xu et al. 2016, table B.

Note: We report crude death rates not adjusted for the age distribution of the population.

As its population ages, Puerto Rico has seen crude death rates for diabetes and Alzheimer’s disease rise over the past five years (table 2). However, adjusted for the changing age distribution in Puerto Rico, death rates for most leading causes of death have fallen (Departamento de Salud 2015b).

TABLE 2

**Death Rates for Five Primary Causes of Death in Puerto Rico, 2009–13**

Crude Rate Unadjusted for Age (per 100,000)						
Rank	Cause of death	2009	2010	2011	2012	2013
1	Cancer	136.1	139.7	143.4	149.0	144.4
2	Diseases of the heart	139.7	140.0	143.4	139.4	140.7
3	Diabetes	75.3	79.5	87.5	85.3	87.0
4	Alzheimer’s disease	42.8	50.1	49.9	55.3	50.6
5	Cerebrovascular disease	39.0	40.4	41.1	37.3	37.4
Age-Adjusted Rate (per 100,000)						
Rank	Cause of death	2009	2010	2011	2012	2013
1	Cancer	124.2	123.8	123.4	124.5	117.5
2	Diseases of the heart	129.4	125.7	124.6	117.7	114.1
3	Diabetes	68.3	70.4	75.5	71.0	70.5
4	Alzheimer’s disease	41.0	46.1	44.1	47.0	41.0
5	Cerebrovascular disease	36.6	36.6	35.8	31.6	30.2

Source: Departamento de Salud 2015b.

Despite life expectancies similar to those on the US mainland, adults in Puerto Rico report higher rates of fair or poor health (35.4 percent compared to 17.9 percent, in 2014; CDC 2014a).<sup>11</sup> This gap

decreases slightly when comparing adults living in Puerto Rico to adults living in two states: Florida (a common destination for migrating Puerto Ricans) and Mississippi (a state with poverty levels similar to Puerto Rico). However, the share of adults reporting one or more days in which their physical health was not good was quite similar across Puerto Rico, Florida, Mississippi, and the US mainland. The share of adults reporting one or more days in which their mental health was not good was lower in Puerto Rico than in Florida, Mississippi, or the US mainland (table 3).

**TABLE 3**

**Share of Adults Reporting Fair, Poor, and “Not Good” Health in Puerto Rico, Florida, Mississippi, and the US Mainland, 2014**

Health status	Puerto Rico	Florida	Mississippi	US mainland
Fair or poor health	35.4%	19.3%***	22.0%***	17.9%***
One or more days in which physical health was not good	35.3%	37.5%**	34.1%	35.3%
One or more days in which mental health was not good	21.8%	31.9%***	32.2%***	33.8%***

**Source:** Authors’ analysis of 2014 BRFSS survey data.

**Notes:** Adults are people ages 18 and older. \*/\*\*/\*\* Estimate differs significantly from estimate for Puerto Rico at the 0.10/0.05/0.01 levels, using two-sided tests.

Additionally, adults in Puerto Rico have higher rates of three major chronic conditions diagnosed by physicians, compared with adults on the US mainland: asthma (10.6 percent in PR versus 8.9 percent in the United States), diabetes (15.7 percent in PR versus 10.0 percent in the United States), and hypertension (42.3 percent in PR versus 31.4 percent in the United States; CDC 2014a).<sup>12</sup> However, the share of the population that is overweight or obese is similar in Puerto Rico and the US mainland (65.9 percent in PR versus 65.0 percent in the United States; CDC 2014a). Compared with children living on the US mainland, children in Puerto Rico experience higher rates of asthma (14.1 percent in PR versus 9.2 percent in the United States<sup>13</sup>), but children ages 14 to 18 had lower rates of overweight and obesity (25.1 percent in PR versus 29.9 percent in the United States; CDC 2015a). Additionally, children under the age of 14 have lower incidence of type 1 diabetes (16.8 per 100,000 in PR versus 23.7 per 100,000 in the United States).<sup>14</sup>

Communicable diseases have also been a primary concern in Puerto Rico, and the surveillance of these diseases is an important component of Puerto Rico’s health infrastructure. Communicable diseases include sexually transmitted infections, such as HIV/AIDS, and vector-borne diseases, such as dengue, chikungunya, and Zika viruses. Because of the islands’ tropical climate, Puerto Ricans face outbreaks of vector-borne diseases more often than residents of the US mainland do. In 2010, Puerto

Rico experienced the largest outbreak of dengue in its history, with more than 21,000 cases reported (CDC 2011). Dengue, which is endemic to Puerto Rico, causes severe fever, headaches, muscle pain, fatigue, nausea, vomiting, and skin rash. Chikungunya, like dengue, is transmitted by mosquitoes. Symptoms of chikungunya are similar to dengue, including fever, joint pain, headache, muscle pain, joint swelling, and rash.<sup>15</sup> In one study, 28 percent of Puerto Ricans tested for the disease had a current or recent case of chikungunya, and of that number, 84 percent had reported their illness in the past three months (Sharp et al. 2014). Two years later, only 1,043 cases were reported and 216 cases confirmed, possibly because the patients gained lifelong immunity to the disease after infection (Departamento de Salud 2016a; Sharp et al. 2014). The mosquito-borne Zika virus presents similarly to chikungunya and dengue but can also cause microcephaly and other severe birth defects in children and Guillain-Barré syndrome in adults (Adams et al. 2016). As of September 21, 2016, 19,465 cases of Zika had been confirmed in Puerto Rico.<sup>16</sup>

Two sexually transmitted infections of concern in Puerto Rico are human papillomavirus (HPV) and HIV. According to the CDC, HPV is the most common sexually transmitted infection in the United States and the primary cause of cervical cancer in women.<sup>17</sup> A vaccine preventing HPV has been available since 2006. The federal government recommends that all children ages 11 to 12 as well as older children or young adults receive the vaccination (see the Structural Access to Care section for information on HPV vaccination rates). Puerto Rico also has a relatively high incidence of HIV (22.7 cases per 100,000) compared to the US mainland (16.5 cases per 100,000).<sup>18</sup> As of December 2015, 47,476 HIV/AIDS cases, including 27,178 deaths, have been diagnosed in Puerto Rico (Departamento de Salud 2015a).

## Cost and Payment Environment

### MEDICAID

Puerto Rico has two distinct layers within its Medicaid program. The first layer, which we call the commonwealth's traditional Medicaid program, operates similar to Medicaid programs found on the US mainland. The commonwealth receives matching funds from the federal government to provide coverage to certain federally mandated populations and can provide coverage to certain optional groups through waivers (Mach et al. 2016). The second layer is funded solely by the commonwealth and receives no matching funds from the federal government. All health care in both the traditional and the commonwealth-funded Medicaid programs is provided through managed care organizations regulated

by ASES under contract with the DS.<sup>19</sup> Puerto Rico has no Medicaid fee-for-service (FFS) system. The DS maintains full responsibility for making eligibility determinations.

Income eligibility for the commonwealth's traditional Medicaid program is determined using the commonwealth poverty level (CPL). The federal poverty level, established in 1963, was set at three times the cost of a minimum food diet and is updated annually based on inflation and adjusted for family size, composition, and age of the householder.<sup>20</sup> Unlike the FPL, the CPL was not designed with any reference to cost of living.<sup>21</sup> It was established solely to provide an eligibility threshold for the commonwealth's traditional Medicaid program and has not been updated to reflect inflation since 1998 (Sebelius 2013). As of 2016, the CPL was \$6,600 for an individual, and the FPL was \$11,880 for an individual (Sebelius 2013).<sup>22</sup>

Income eligibility for the commonwealth's traditional Medicaid program varies by targeted group and covers individuals and families up to 133 percent of the CPL, or 50 percent of FPL.<sup>23</sup> Several factors contribute to the commonwealth's lower eligibility levels. First, Puerto Rico does not provide Medicaid coverage to all federally mandated populations (GAO 2014; Mach et al. 2016). Second, the CPL is significantly lower than the FPL. In 2014, for example, the CPL for a family of three was 38 percent of the FPL. As family size increases, the CPL is a smaller share of the FPL (Mach et al. 2016; Portela and Sommers 2015).<sup>24</sup> Thus, most low-income individuals ineligible for traditional Medicaid in Puerto Rico would qualify for traditional Medicaid on the US mainland. To help low-income people who do not qualify for the commonwealth's traditional Medicaid program, Puerto Rico offers commonwealth-funded Medicaid coverage to residents with income between 133 and 200 percent of the CPL (GAO 2014). In other words, the commonwealth-funded Medicaid program provides coverage to low-income Puerto Ricans living between 55 to 82 percent of the 2016 FPL. This coverage is available for adults with and without children. However, the eligibility level is still substantially lower than the Medicaid eligibility level (138 percent of FPL) in states that have expanded Medicaid under the Affordable Care Act (ACA).

The two programs differ crucially in providing access to health care on the US mainland. The commonwealth's traditional Medicaid program will reimburse for care provided on the US mainland, while the commonwealth-funded Medicaid program does not.<sup>25</sup> However, migration to the US mainland offers a path to Medicaid coverage for low-income Puerto Ricans who are ineligible for the commonwealth's traditional Medicaid. Puerto Ricans are native-born US citizens and are therefore eligible for Medicaid in the states to which they move (subject to that state's eligibility requirements), similar to any low-income native-born US citizen moving between two states (Fortuny and Chaudry 2011).

Federal funding for Puerto Rico's Medicaid program differs from that for the US mainland in two significant ways. First, Puerto Rico's federal Medicaid match rate (federal medical assistance percentage, or FMAP) is a fixed rate, raised from 50 to 55 percent in 2011 by the ACA for most Medicaid expenditures.<sup>26</sup> From 2014 to 2015, Puerto Rico received a 2.2 percentage point FMAP increase for residents who were not “newly eligible” for Medicaid coverage through the ACA’s Medicaid expansion. For services provided to residents already offered Medicaid at the time of ACA’s passage but also included in the law’s Medicaid expansion population, the federal government created a formula that resulted in a higher FMAP in Puerto Rico (78 percent in 2014; Mach et al. 2016).<sup>27</sup> On the US mainland, by contrast, FMAPs vary according to states’ per capita income, from 50 to 83 percent.<sup>28</sup> States with higher per capita incomes have lower FMAPs, and states with lower per capita incomes have higher FMAPs. According to Sebelius (2013), Puerto Rico’s per capita income was approximately \$18,100 in 2008, and a state with this per capita income would typically receive the maximum statutory FMAP of 83 percent.<sup>29</sup>

Second, federal funding for Puerto Rico's Medicaid program is statutorily capped. In fiscal year (FY) 2014, this cap was set at \$321 million (Mach et al. 2016).<sup>30</sup> The federal government matches each dollar that Puerto Rico spends on its traditional Medicaid program up to this limit and does not match any spending above this cap (President’s Task Force on Puerto Rico’s Status 2011). In effect, Puerto Rico’s Medicaid program operates as a block grant (Portela and Sommers 2015). On the other hand, Medicaid programs on the US mainland operate as entitlement programs, with an unlimited amount of federal matching dollars available as long as those Medicaid agencies can demonstrate that the expenses are valid under the program’s rules. When Puerto Rico’s total contribution is included, the effective FMAP is estimated to be approximately 18 percent (President’s Task Force on Puerto Rico’s Status 2011). As a result of these federal funding constraints, Puerto Rico has placed limits on certain services typically provided under Medicaid (President’s Task Force on Puerto Rico’s Status 2011).

The ACA, in addition to raising Puerto Rico’s FMAP, provided two additional sources of new funding for the commonwealth’s Medicaid program. First, the ACA gave Puerto Rico an additional \$5.5 billion in federal Medicaid funding, to be spent between 2011 and 2019 (Shin et al. 2015).<sup>31</sup> Second, Puerto Rico received \$925 million in lieu of funds the commonwealth would have received to establish a Marketplace, but these funds can only be accessed after the \$5.5 billion is spent and are only available through FY 2019. Puerto Rico is projected to spend both the \$5.5 billion and the \$925 million by the end of FY 2017.<sup>32</sup>

In FY 2015, Puerto Rico provided coverage for 10 of the Medicaid program’s 17 federally mandated benefits. Covered mandated benefits were Early and Periodic Screening, Diagnostic, and Treatment

services, inpatient hospital services, laboratory and X-ray services, medical or surgical services provided by a dentist, outpatient hospital services, physician services, tobacco cessation for pregnant women, family planning services, federally qualified health center services, and rural health clinic services. Mandated benefits not covered by Puerto Rico were home health services for those entitled to nursing facility services, nonemergency transportation to medical care, certified pediatric and family nurse practitioner services, nurse midwife services, nursing facility services for those over age 21, emergency services for certain legalized aliens and undocumented aliens, and freestanding birth center services (GAO 2016). According to CMS, Puerto Rico does not cover nursing facility care because the commonwealth lacks the necessary nursing facility infrastructure, and Puerto Rico does not cover freestanding birth centers or nurse midwife services because the commonwealth does not regulate those services (GAO 2014, 2016). In FY 2015, Puerto Rico also covered a number of optional benefits: clinic services; dental services; eyeglasses and prosthetics;<sup>33</sup> outpatient prescription drugs; physical therapy and related services; diagnostic, screening, preventive, and rehabilitative services; inpatient psychiatric hospital services for those under age 21; and inpatient hospital services for people ages 65 or older in an institution for mental diseases. Puerto Rico did not cover the following optional benefits: hospice care, private duty nursing services, intermediate care facilities for individuals with intellectual disabilities, personal care services, targeted case management services, and nursing facility services for people ages 65 and older in an institution for mental diseases (GAO 2016).

Medicaid managed care also pays less per member per month on average in Puerto Rico than on the US mainland (\$165 in PR versus \$505 on the US mainland).<sup>34</sup> We did not find any research assessing whether this spending gap resulted from differences in Medicaid payment rates or from differences in the utilization of services. However, a letter from the Puerto Rican health care community to the PROMESA Economic Development Task Force argues that the cost difference is driven by low rates of reimbursement negotiated by Medicaid managed care organizations with physicians.<sup>35</sup> The costs of all nonlabor inputs (e.g., utilities, office space, and medical equipment) in Puerto Rico are “at or above the national average.” Thus, labor costs are the only costs that can be constrained to keep Medicaid spending within Puerto Rico’s available budget. These same authors also note that family or general practitioners practicing on the US mainland earn significantly more than they would practicing in Puerto Rico (see the Health Care Professionals section for details).

## MEDICARE

In Puerto Rico, as on the US mainland, Medicare pays for covered health services for those ages 65 and older as well as permanently disabled individuals under the age of 65 through a four-part structure (see the Puerto Rico’s Health Care System section for more information; Mach et al. 2016). Even though



Puerto Ricans pay the same Medicare payroll taxes, spending per Puerto Rican enrollee is lower than that for any state;<sup>36</sup> this disparity stems from lower Medicare payment rates in Puerto Rico.<sup>37</sup> Puerto Rico's per capita Medicare spending is \$5,230, significantly less than the national average of \$9,501.<sup>38</sup> Additionally, since the implementation of the ACA, funding for Puerto Rico's Medicare Advantage (MA) plans has been reduced by about \$1 billion annually (Michelson 2015).

All Puerto Rican residents who have paid 10 years of payroll taxes are entitled to Medicare Part A. The methodology for setting provider payments under Part A is largely the same for acute care hospitals in Puerto Rico and on the US mainland. Payments are based on rates set up as part of the Inpatient Prospective Payment System (IPPS). As of January 1, 2016, the IPPS base rates in Puerto Rico are equivalent to the base rates paid on the US mainland. Differences between the two payment methodologies include adjustments for low-volume hospitals, sole community hospitals, and Medicare-dependent hospitals, as well as adjustments for quality programs (e.g., the Hospital-Acquired Condition Reduction Program, the Hospital Readmissions Reduction Program, and the Hospital Value-Based Purchasing Program)—none of which are available to Puerto Rican hospitals. Like hospitals located on the US mainland, Puerto Rican hospitals receive graduate medical education payments, disproportionate share hospital (DSH) payments, and uncompensated care payments under Medicare. However, Puerto Rican residents are ineligible for Supplemental Security Income (SSI), which is used to calculate the Medicare DSH payment for low-income patients and uncompensated care payments for charity care and non-Medicare bad debt provided by hospitals. Health care advocates such as the Puerto Rico Healthcare Crisis Coalition argue that this disadvantages hospitals in the commonwealth.<sup>39</sup> In response to these arguments, CMS's FY 2017 Medicare IPPS rule establishes a substitute for the SSI part of the DSH payment formula. Similarly, CMS will also use a new formula in FY 2017 to estimate uncompensated care in Puerto Rican hospitals (CMS 2016b).<sup>40</sup> This change is expected to increase uncompensated care payments to Puerto Rican hospitals by 11.2 percent in FY 2017 (Mach et al. 2016).

The most significant difference between the designs of Part B in Puerto Rico and Part B on the US mainland is the approach to enrollment. In Puerto Rico, Medicare beneficiaries must opt into Part B (Shin et al. 2015). On the US mainland, Medicare automatically enrolls beneficiaries in Part B, who can then opt out of this program (Elliott et al. 2012; Mach et al. 2016). Puerto Rico's opt-in approach subjects residents to fines if they do not enroll in Part B at the time of initial eligibility. Puerto Rican residents currently incur over \$7 million per year in late enrollment penalties (Mach et al. 2016; Portela and Sommers 2015). However, instituting Part B auto-enrollment in Puerto Rico would raise another set of problems. Unlike the US mainland, Puerto Rico does not have a program to help low-income Medicare beneficiaries pay their Part B premiums (known as the Medicare Savings Program). Thus,

auto-enrollment would force low-income Puerto Ricans to pay Part B premiums they cannot afford (Mach et al. 2016). A greater proportion of Puerto Rican Medicare beneficiaries are covered by Part A only and not Part B than on the US mainland (18 percent versus 8 percent in 2012; Shin et al. 2015). Anecdotal information from FQHCs indicates that Medicare beneficiaries covered by Part A only tend to be medically indigent, find Part B premiums unaffordable, and lack the social supports needed to enroll in an MA special needs plan for those eligible for both Medicare and Medicaid benefits (known as duals; Levis-Peralta et al. 2016).

A significant and recent change in the methodology for determining Medicare physician payments in Puerto Rico relates to CMS's geographic adjustment factor, which is determined using three geographic practice cost indices (GPCIs)—for physician work, practice expense, and malpractice insurance. Previously, Puerto Rico was the only territory whose geographic adjustment was based on available territory-specific data, an approach that made Puerto Rico's geographic adjustment factor lower than those of all other Medicare localities, including other territories. Recognizing stakeholder concerns about the validity of the data used to calculate Puerto Rico's GPCIs, CMS aligned Puerto Rico's GPCI methodology with those of the other island territories in the 2017 Medicare physician fee schedule final rule, setting Puerto Rico's GPCI values at the national average (1.0). CMS will continue to assign the Virgin Islands a GPCI value of 1.0 for each index, and the Pacific Islands Hawaii's values. CMS noted in the final rule that while some stakeholders have indicated that the cost of obtaining medical equipment and supplies is higher in islands and territories like Puerto Rico because of shipping and transportation expenses, CMS cannot quantify the variation in costs facing island territories; CMS lacks a comprehensive national database containing this information (MaCurdy et al. 2016).<sup>41</sup>

The overwhelming majority of Puerto Ricans elect to receive Medicare benefits through Part C, an optional alternative to Parts A and B that delivers Medicare benefits through private managed care plans (Mach et al. 2016). About 70 percent of beneficiaries are enrolled in Part C, known as Medicare Advantage, in Puerto Rico (Mach et al. 2016; Portela and Sommers 2015; Shin et al. 2015). By contrast, only about 30 percent of US mainland beneficiaries enroll in these plans (Mach et al. 2016; Shin et al. 2015). MA plans in Puerto Rico, as on the US mainland, often subsidize Medicare's Part B premium and have lower cost-sharing than does traditional Medicare, which has made these plans particularly attractive to low-income Puerto Rican Medicare beneficiaries (Rivera-Hernandez et al. 2016). In 2012, almost all MA plans reduced Part B premiums by \$10.00 to \$96.60 per month (Sebelius 2013).

Puerto Rican MA plans receive significantly lower per capita payments than MA plans on the US mainland do (Rivera-Hernandez et al. 2016). One article estimated that MA rates in Puerto Rico are 34 percent below the US average and 25 percent below the lowest rate paid in the United States.<sup>42</sup> The low

Medicare FFS payment rates described above and insufficient risk adjustment contribute to this differential. According to one site visit respondent, Puerto Rico's Medicare FFS population is so small that it provides an actuarially unsound basis for setting the commonwealth's MA rates and that the share of FFS beneficiaries without any claims in Puerto Rico is three times the national average. The respondent also noted that those who choose Medicare FFS over MA are rich or have no health problems. In 2016, CMS further reduced payments to Puerto Rican MA plans by 11 percent while increasing payments to US-based plans by 3 percent.<sup>43</sup> However, CMS also announced that in 2017 it will implement a number of changes to the 2017 Rate Announcement to benefit MA enrollees in Puerto Rico, such as increasing payments to the risk adjustment model, incorporating increased hospital payments, and adjusting the FFS experience to "reflect the propensity of zero dollar claimants nationwide, rather than . . . the propensity of zero dollar claimants solely in Puerto Rico." CMS will also make adjustments to the star rating system for quality bonus payments to account for enrollees' socioeconomic status and ineligibility for the low-income subsidy program; these changes are expected to level the playing field between MA plans operating in Puerto Rico and on the US mainland (CMS 2016).<sup>44</sup> Managed care organizations offering MA plans in Puerto Rico include Triple-S Advantage, First Medical Health Plan, Constellation Health, Medicare y Mucho Más, PMC Medicare Choice, Humana Health Plans of Puerto Rico, and Medical Card System Classicare.<sup>45</sup>

Part D prescription insurance is optional for all Medicare beneficiaries in the United States (Mach et al. 2016). This program functions similarly in Puerto Rico and on the US mainland. One exception is the low-income subsidies program, which is available only on the US mainland; in its place, the Medicare Modernization Act provided Medicaid coverage of prescription drugs for Puerto Rico's Medicare beneficiaries dually eligible for Medicaid (called the Enhanced Allotment Plan; Mach et al. 2016; Sebelius 2013). The reasons for Puerto Rico's exclusion from the low-income subsidies program are unknown (Mach et al. 2016). An Urban Institute analysis of 2014 monthly enrollment data found that of the 61 MA plans in Puerto Rico for which data were available, 90.2 percent offered Part D, and overall 99.6 percent of Puerto Rican enrollees have plans that offered Part D (CMS 2014). However, research suggests that Puerto Rican Medicare beneficiaries still struggle to pay for prescription drugs (Elliott et al. 2012; Mach et al. 2016; Rivera-Hernandez et al. 2016; Sebelius 2013).

## PRIVATE INSURANCE

Private insurance, which includes both employer-sponsored coverage and individual market coverage, is less common and less of a focus for policymakers in Puerto Rico than on the US mainland; findings from the site visit confirmed this. About 34 percent of Puerto Rican residents had employer-sponsored coverage or direct-purchase health insurance in 2014, compared with 59 percent on the US mainland.<sup>46</sup>

Puerto Rico's major private insurers include Triple-S Salud, Medical Card System, and MAPFRE.<sup>47</sup> Some site visit respondents said that individual health plans were relatively inexpensive but that those enrolled in these types of plans have to wait for services because of physician shortages for specific types of care (e.g., endocrinology).

In 2014, the US Department of Health and Human Services determined that as a territory, Puerto Rico does not fit the definition of a state under Title I of the ACA, so the law's reforms to the group and individual markets do not apply in the commonwealth. These excluded reforms include the individual mandate, employer mandate, small business tax credits, and premium tax credits for purchasing private coverage in a health insurance Marketplace. Furthermore, Puerto Rico has not established its own health insurance Marketplace; Puerto Rican residents are not eligible to use the federal Marketplace to purchase health insurance, even without subsidies (Mach et al. 2016; Portela and Sommers 2015).

## Structural Access to Care

Access is defined as the "timely use of personal health services to achieve the best health outcomes" and measured by assessing the presence (or absence) of resources that facilitate health care (e.g., having health insurance or a usual source of care), ease of access to health care (e.g., wait times for appointments), and the successful receipt of needed services (e.g., well-child visits, immunizations; IOM 1993). One of the three goals for Mi Salud's 2013–16 Quality Strategy is improving access to primary and preventive services (Commonwealth of Puerto Rico 2014). To evaluate whether Mi Salud members are receiving quality services, the following measures are collected quarterly: breast cancer screening, cervical cancer screening, cholesterol management for high-risk populations, diabetes care management, access to preventive services, annual dentist visits, timeliness of prenatal care, and asthma management.

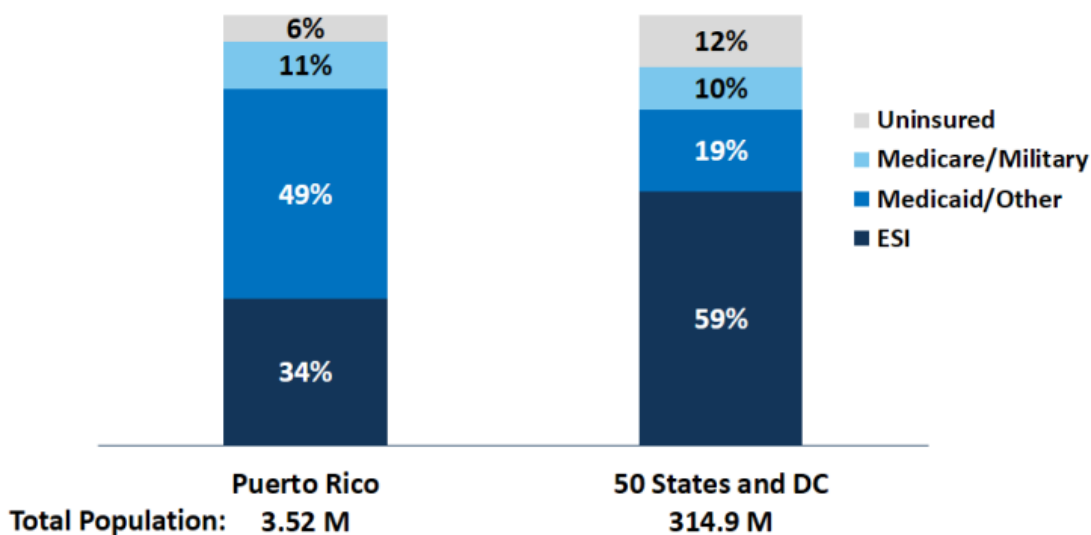
Our environmental scan revealed some information about the state of health care access in Puerto Rico. However, the fact that we only found a small number of articles suggests that access in Puerto Rico has not been well-studied and that further research is needed to fully understand the state of access to care in the commonwealth (Jiménez et al. 2013; Langellier et al. 2012; Portela and Sommers 2015).

Most of Puerto Rico's residents have some form of health insurance—about 94 percent in 2014, compared with 88 percent on the US mainland (figure 1). Almost two-thirds of Puerto Rico's population had public coverage in 2014, which is significantly higher than the public coverage rate on the US

mainland (29 percent). Puerto Rico’s high Medicaid coverage (both traditional and commonwealth Medicaid) drove most of this difference, with 49 percent of the commonwealth population covered by Medicaid; only 29 percent of the US mainland population received Medicaid coverage in the same year.<sup>48</sup>

FIGURE 1

Health Insurance Coverage of the Total Population in Puerto Rico and the 50 States and DC, 2014



SOURCE: Kaiser Family Foundation estimates based on the Census Bureau’s 2014 American Community Survey, 1-year estimates.



Source: Kaiser Commission on Medicaid and the Uninsured, “8 Questions and Answers about Puerto Rico,” updated September 26, 2016, <http://kff.org/disparities-policy/fact-sheet/8-questions-and-answers-about-puerto-rico/>.

Note: ESI = employer-sponsored insurance.

Puerto Rican adults experienced better access to care in certain domains, after controlling for economic and demographic factors including race/ethnicity, age, sex, household income, educational attainment, urban/rural residence, marital status, and employment. They were more likely to have a usual source of care and a check-up within the past year and less likely to have experienced cost-related delays, compared with their counterparts on the US mainland (Portela and Sommers 2015). An Urban Institute analysis of 2014 Behavioral Risk Factor Surveillance System (BRFSS) data had similar results. The share of adults who did not have a personal physician or health care provider was slightly lower in Puerto Rico than on the US mainland. The differential was larger when comparing adults in Puerto Rico to those in Florida and Mississippi. Similarly, the share of adults who had not visited a physician for a

routine check-up in the past year was lower in Puerto Rico than in Florida, Mississippi, and the US mainland (table 4).

TABLE 4

**Use of Physician Services among Adults, 2014**

	Puerto Rico	Florida	Mississippi	US mainland
Share of adults who do not have a personal doctor or health care provider	19.6%	24.1%***	26.5%***	22.8%***
Share of adults who have not visited a physician for a routine check-up in the last year	23.6%	27.1%***	27.5%***	30.0%***

Source: Authors' analysis of 2014 BRFSS survey data.

Notes: Adults are people ages 18 and older. \*/\*\*/\*\* Estimate differs significantly from estimate for Puerto Rico at the 0.10/0.05/0.01 levels, using two-sided tests.

However, the literature contains some evidence of challenges in accessing health care. The literature revealed limited access to prenatal services (Colon-Burgos et al. 2013), dental care (Arévalo et al. 2015), and specialty care.<sup>49</sup> Children may also have trouble accessing primary care. Though 97.5 percent of children typically have a “usual source of care,” 32 percent of caregivers report that their children regularly received care at an emergency department, and 29 percent reported regular care from an urgent care facility (Langellier et al. 2012).

Our environmental scan and site visit also provided some evidence of long wait times to see specialists. One government official has stated that specialty services have exceptionally long wait times, as many as nine months for some specialties.<sup>50</sup> Separately, several site visit respondents also stated that long wait times are a problem for adults and children, especially when making appointments with specialists.

Patients who are publicly insured may still struggle to obtain health care. For example, access to dental care for children with Medicaid may be constrained by a lack of providers who accept public insurance; only 65 percent of pediatric dentists participate in Mi Salud (compared to 100 percent in private insurance; Arévalo et al. 2015). According to 2015 Youth Risk Behavior Surveillance System data, a higher share of high school students in Puerto Rico had not seen a dentist in the past year, compared with the US mainland (34.2 percent versus 25.6 percent; CDC 2015). Medicaid programs operating on the US mainland face similar problems attracting dentists willing to participate in Medicaid; a GAO analysis found that in 25 of the 39 states that responded to a 2009 Association of State and Territorial Dental Directors survey, less than half of dentists in each state provided care to Medicaid patients in 2008. Although only 11 states responded to the survey with information about

dentist participation in CHIP, the GAO report concluded that “dentists’ participation in CHIP is also low” (GAO 2010).

Certain subgroups of the Puerto Rican population also face greater challenges in accessing care. Low literacy, common among people living with HIV, may hinder patients’ understanding or maintenance of self-care behaviors (Rivero-Mendez et al. 2015). Cancer patients, who have significant medical and psychological needs, may struggle to access care outside of the San Juan metropolitan area; the majority of oncologists provide services in the capital region (Castro et al. 2015). Children and adolescents disproportionately struggle to obtain medication intended for the long-term control of asthma, a condition that is common among the commonwealth’s youth (Langellier et al. 2012).<sup>51</sup> Noncitizen women are also less likely to have coverage and more likely to pay out of pocket for prenatal services than women born in Puerto Rico (Colon-Burgos et al. 2013).

There is also some evidence of disparities in access between rural and urban communities. Our scan identified urban/rural disparities in dental care and oncology services. One article reported that areas that are sparsely populated or have lower per capita income struggle to attract and retain dentists (Arévalo et al. 2015). Another article described the lack of oncologists in southern Puerto Rico, which has one of the highest incidences of cancer and cancer mortality in the commonwealth. The study found that southern Puerto Rico lacked sufficient access to oncology services, pediatric oncology services, and psychosocial support services, disadvantaging patients who live in rural areas and must travel great distances to obtain services in the San Juan metropolitan area (Castro et al. 2015).

#### USE OF DIAGNOSTIC CARE AND TREATMENT

According to BRFSS data, screening rates for diabetes, mammograms, and pap smears in Puerto Rico were the same or better than rates on the US mainland (Portela and Sommers 2015). However, this and one other study found that screening rates for colorectal cancer in the commonwealth were lower than on the US mainland; this is consistent with other literature (Ortiz-Ortiz et al. 2014; Portela and Sommers 2015). Although colorectal cancer screening is available in Puerto Rico, screening for the disease—the second most common cancer diagnosis among men and women—remains well below the Healthy People 2020 target of 70.5 percent (Ortiz-Ortiz et al. 2014). In 2012, the share of adults over the age of 50 who had ever had colorectal screening in Puerto Rico (e.g., sigmoidoscopy or colonoscopy) was 47 percent (CDC 2014a). More research is needed to understand why this is the case, but current research suggests that the gap may be partially attributable to educational attainment. A 2013 study using data from the 2008 BRFSS found that patients with more education were more likely to get screened for colorectal cancer in Puerto Rico (Lopez-Charneco et al. 2013).

Findings from a study on late HIV testing—defined as a patient being diagnosed with AIDS within a year of his or her HIV diagnosis—indicate that there may be a “gap in early HIV detection in Puerto Rico.” From 2010 to 2011, about half of the patients studied presented for care late, which can result in higher transmission, lower effectiveness of treatment, and worse outcomes. The study also found that men were more likely than women to be late testers, perhaps because of their lower overall rates of health services utilization and nonuse of prenatal care. Additional risk factors for late testing included older age (possibly because of lack of HIV awareness among older patients and their physicians) and use of injection drugs (possibly because of decreased access to care, social stigma, and legal fears among injection drug users; Tossas-Milligan et al. 2016). These results are consistent with another study that focused on HIV testing among gay men in San Juan; findings from that study suggest that gay men in San Juan receive HIV testing less frequently than recommended by the CDC (Chapin-Bardales et al. 2016).

Another study found that the availability of effective HIV prevention services is more limited in Puerto Rico than in other parts of the United States. For example, one approach that has proven effective uses a combination of services, specifically syringe exchange programs, opiate substitution treatment, and antiretroviral treatment. Findings from this study indicate that these services are less common in Puerto Rico (Deren et al. 2014). Condom use—one way to prevent transmission of HIV—is comparable among sexually active high school-aged youth in Puerto Rico and the United States. Among Puerto Rican youth who are sexually active, 49.6 percent (confidence interval 41.8–57.5) indicated that they used a condom during their last sexual intercourse (according to 2015 Youth Risk Behavior Surveillance System data). On the US mainland, that figure is 43.1 percent (confidence interval 40.2–46.1; CDC 2015).

Less clear is the relative extent of treatment provided to patients with HIV who know their status. A 2014 study found that among Puerto Rican residents who are aware of their HIV status, 29 percent had “no evidence of viral load testing, CD4 count, or antiretroviral treatment during the past year.” By comparison, 35 percent of New York City residents and 46 percent of New Jersey residents who knew their HIV status did not receive care (Deren et al. 2014). However, these results should be interpreted with caution as they are not generalizable to the US mainland.

## USE OF PREVENTIVE CARE

Our environmental scan revealed little information about the availability and delivery of preventive services in Puerto Rico. A study on HPV in Puerto Rico found that few publications about HPV and the HPV vaccine existed in the commonwealth even two years after the Food and Drug Administration approved the vaccination in 2006. This study found that only 37.2 percent of men and women had



heard of HPV and 33.4 percent had heard of the vaccine, and that the HPV vaccination rate was 20 percent for girls and 13 percent for boys ages 11 to 18 in 2014 (Reyes et al. 2015). Another study of HPV vaccination in Puerto Rico found that only 21 percent of girls ages 11 to 18 completed a full vaccination series (Fernández et al. 2014). On the US mainland, by contrast, 63 percent of girls and 50 percent of boys ages 13 to 17 received the HPV vaccination between 2014 and 2015 (CDC 2015c).

Another set of studies laid out evidence showing that Puerto Rico’s influenza and pneumonia immunization rates are low relative to the US mainland. One study found that 25.5 percent of Puerto Rican Medicare beneficiaries received a pneumonia immunization in 2008, while the rate for Spanish-speaking Medicare beneficiaries on the US mainland was almost twice that figure, 47.4 percent. The gap between Medicare beneficiaries in Puerto Rico and English-speaking Medicare beneficiaries was even wider, with 70.9 percent of English-speaking Medicare beneficiaries on the US mainland reporting a pneumonia immunization. A similar trend was found in influenza immunization rates among Medicare beneficiaries living in Puerto Rico, Spanish-speaking Medicare beneficiaries living on the US mainland, and English-speaking Medicare beneficiaries living on the US mainland (32.7, 67.7, and 73.3 percent, respectively; Elliott et al. 2012). A second study explored why Puerto Rico had low influenza vaccination rates using more recent data. During the 2013–14 season, 18 percent of Puerto Ricans reported receiving the influenza vaccination, compared with 46 percent on the US mainland (Arriola et al. 2015; CDC 2014b). Common reasons cited for remaining unvaccinated included low perceived risk of catching influenza, self-reported access problems, and concerns about the vaccine’s safety (Arriola et al. 2015). An Urban Institute analysis of BRFSS data found that the 2014 influenza vaccination rate among adults in Puerto Rico was also lower than in Florida, Mississippi, and the US mainland (table 5).

TABLE 5

**Influenza Vaccination Rates among Adults in Puerto Rico, Florida, Mississippi, and the US Mainland, 2014**

	Puerto Rico	Florida	Mississippi	US mainland
Share of adults who have not received a flu vaccine in the last year	74.1%	68.4%***	63.0%***	61.1%***
Share of adults ages 65 and older who have not received a flu vaccine in the last year	60.3%	47.2%***	33.4%***	40.2%***

Source: Authors’ analysis of 2014 BRFSS survey data.

Notes: Adults are people ages 18 and older. \*/\*\*/\*\* Estimate differs significantly from estimate for Puerto Rico at the 0.10/0.05/0.01 levels, using two-sided tests.

## USE OF BEHAVIORAL HEALTH SERVICES

Information about the availability of behavioral health services in Puerto Rico is limited. Generally, medical services are more widely available than behavioral health services, and patients with behavioral health problems often seek care from primary care providers and at nonpsychiatric hospitals.

Psychological services are also typically not provided in the commonwealth's general hospitals (Jiménez et al. 2013).

## Quality of Care

Providing patients with high-quality health care involves health care processes and systems that focus on goals related to safety, efficiency, effectiveness, patient-centeredness, equity, and timeliness of care (IOM 2001). As part of its 2013–16 Quality Strategy, Mi Salud has two priorities related to quality: assuring quality care to all Medicaid and dual eligible enrollees by implementing a physical and behavioral health “Integrated Model,” which aims to improve access in a “holistic view” and increase members’ satisfaction with provided services and primary care experiences (Commonwealth of Puerto Rico 2014).

Several articles discussed Puerto Rico's quality of care across a wide range of measures, specifically in the context of disparities between Puerto Rico and US mainland residents. Medicare appears to be an area of particular concern. One recent study compared the quality of care delivered on the US mainland to that delivered in Puerto Rico along 17 quality measures<sup>53</sup> and found that Hispanic MA enrollees in the territory of Puerto Rico receive substantially lower quality of care than white or Hispanic enrollees residing in the United States in 15 of the selected measures. Hispanic MA enrollees in Puerto Rico and the US mainland had statistically similar performances for two measures: colorectal cancer screening for patients ages 50 to 75 and annual LDL testing (Rivera-Hernandez et al. 2016). An older study also found that Medicare beneficiaries in Puerto Rico experience lower quality of care than US mainland residents for more than 20 process measures (Jencks et al. 2000).<sup>54</sup>

## PATIENT SATISFACTION

There was very little information on patient satisfaction in Puerto Rico. A few sources focused on the experiences of older adults. For example, a 2011 AARP survey of adults ages 50 and older in Puerto Rico found that 46 percent of respondents felt that health care was in a state of crisis or had major problems. A slightly higher number of respondents (47 percent) felt that health care had minor or no problems. In the same survey, 29 percent of respondents felt that health care quality had worsened

over the past five years, 26 percent felt that health care had improved, and 44 percent of respondents reported that it had stayed the same (AARP 2011). Another source describing patient satisfaction in Puerto Rico reviewed the results from the 2008 Medicare Consumer Assessment of Health Care Providers and Systems survey for both the US mainland and Puerto Rico. It found that Puerto Rican Medicare beneficiaries had less positive experiences getting needed care and getting care quickly, but better doctor-patient communication and customer service than Medicare beneficiaries on the US mainland (Elliott et al. 2012).

Another article described perceived patient-provider communication quality, which has been associated with increased patient satisfaction. This study found that among the 450 Puerto Rican adults surveyed, provider communication quality ratings were lower for those who were unemployed, lacked trust in their providers, and had depressive symptoms. Those who frequently visited their doctor in the last year rated provider communication quality higher (Calo et al. 2014). A recent analysis of the Health Information National Trends Survey indicated that patient ratings of patient-provider communication were lowest among patients who had fair/poor health status, lacked a regular provider, did not have health insurance, and were not employed (Spooner et al. 2016).

## Health Care Infrastructure

### HOSPITAL FACILITIES

The Urban Institute conducted an analysis of 2014 American Hospital Association (AHA) survey data. Below, we report on the Puerto Rican hospitals included in AHA's database. These data showed that Puerto Rico has 59 hospitals, more than half of them for-profit and one-third nonprofit.<sup>55</sup> By contrast, about a quarter of all US hospitals are for-profit, and half are nonprofit (table 6).

TABLE 6

Hospital Ownership in Puerto Rico and the Rest of the United States, 2014

Hospital type	Puerto Rico		United States <sup>a</sup>	
	Number	Share of total (%)	Number	Share of total (%)
Nonprofit	19	32.2***	3,085	49.9***
For-profit	31	52.5***	1,613	26.1***
Non-federal government	8	13.6	1,266	20.5
Federal government	1	1.7	216	3.5
<i>Total</i>	<i>59</i>	<i>100.0</i>	<i>6,180</i>	<i>100.0</i>

Source: Authors' analysis of 2014 AHA Annual Survey data.

Notes: <sup>a</sup> Excluding Puerto Rico. \*/\*\*/\*\* Estimate differs significantly at the 0.10/0.05/0.01 levels, using two-sided tests.

The breakdown of hospitals by their primary focus is fairly similar in Puerto Rico and the United States. The AHA survey data show that about three-quarters of all hospitals in Puerto Rico and the United States are general medical/surgical hospitals. The remainder consists of a variety of specialty hospitals, including psychiatric, cancer, and children’s hospitals. Puerto Rico has a slightly higher share of children’s hospitals, cancer hospitals, and chronic disease hospitals compared with the United States (table 7). However, one respondent noted that some hospital services, particularly children’s specialty services (e.g., neurology, cardiology), have been cut because of nonpayment by the Puerto Rican government. Puerto Rico also lacks an air ambulance service because of nonpayment.

Puerto Rico does not have any critical access hospitals (CAHs), which provide hospital care in rural areas without enough people to support a full-service acute care hospital.<sup>56</sup> For Medicare FFS beneficiaries, CMS reimburses CAHs for most inpatient and outpatient services at 101 percent of reasonable costs. CAHs negotiate MA payment rates with individual plans (NORC Walsh Center for Rural Health Analysis and RUPRI Center for Rural Health Policy Analysis 2008). Ten of Puerto Rico’s municipalities meet the CMS definition of “rural” but do not have facilities that meet the criteria for CAH conversion. Current law does not allow CMS to certify new facilities as CAHs, so to meet the requirements for becoming a CAH, one would need to establish and operate an acute care hospital without the CAH designation in one of the ten qualifying rural municipalities. Additionally, Puerto Rico’s high MA penetration rate would limit the extent to which a CAH operating in Puerto Rico would benefit from higher CAH reimbursement under the Medicare FFS program (Sebelius 2013).

**TABLE 7**  
**Hospital Types in Puerto Rico and the United States, 2014**

Hospital type	Puerto Rico		United States <sup>a</sup>	
	Number	Share of total (%)	Number	Share of total (%)
General medical/surgical	45	76.3	4648	75.2
All other	14	23.7	1532	24.8

Source: Authors’ analysis of 2014 AHA Annual Survey data.

Notes: <sup>a</sup> Excluding Puerto Rico. \*/\*\*/\*\* Estimate differs significantly at the 0.10/0.05/0.01 levels, using two-sided tests.

One significant difference between hospitals in Puerto Rico and the United States is their size. Puerto Rico has more mid-size hospitals than the United States. About half of Puerto Rican hospitals have between 100 and 199 beds, while only a fifth of US beds fall into that category. Puerto Rico also does not have any very large hospitals, defined as having 500 beds or more; in contrast, 5 percent of US hospitals fall into this category (table 8).

TABLE 8

## Hospital Capacity in Puerto Rico and the United States, 2014

Number of hospital beds	Puerto Rico		United States <sup>a</sup>	
	Number	Share of total (%)	Number	Share of total (%)
6–24	2	3.4**	740	12.0**
25–49	6	10.1**	1,441	23.3**
50–99	7	11.9	1,236	20.0
100–199	30	50.9***	1,244	20.1***
200–299	9	15.3	630	10.2
300–399	3	5.1	372	6.0
400–499	2	3.4	206	3.3
500+	0	0.0*	311	5.0*
<i>Total</i>	<i>9,072</i>	<i>100.0</i>	<i>928,680</i>	<i>100.0</i>
<i>Beds per 1,000 people</i>	<i>2.56</i>	<i>N/A</i>	<i>2.91</i>	<i>N/A</i>

Source: Authors' analysis of 2014 AHA Annual Survey data.

Notes: <sup>a</sup> Excluding Puerto Rico. \*/\*\*/\*\* Estimate differs significantly at the 0.10/0.05/0.01 levels, using two-sided tests.

Another major difference between hospitals in Puerto Rico and the United States is the extent of their affiliation with a system. Puerto Rican hospitals tend to be more decentralized than hospitals in the United States. About 79.7 percent of Puerto Rican hospitals are not part of a larger organization. In comparison, 36.5 percent of US hospitals fall into this category (table 9).

TABLE 9

## Hospital System Status in Puerto Rico and the United States, 2014

System status	Puerto Rico		United States <sup>a</sup>	
	Number	Share of total (%)	Number	Share of total (%)
Not part of a system	47	79.7***	2,256	36.5***
Part of a system	12	20.3***	3,924	63.5***

Source: Authors' analysis of 2014 AHA Annual Survey data.

Notes: <sup>a</sup> Excluding Puerto Rico. \*/\*\*/\*\* Estimate differs significantly at the 0.10/0.05/0.01 levels, using two-sided tests.

Considerable variation in hospital and bed capacity exists across the commonwealth's seven DS health care regions. Puerto Rico's most populous region, the San Juan metro area, has the largest share of the commonwealth's hospitals (33.9 percent) and hospital beds (39.7 percent). The San Juan metro area has the second-lowest ratio of hospitals to residents (1 hospital for every 42,455 inhabitants) and the highest rate of hospital beds per 1,000 residents (4.2). In contrast, the Bayamón region, just outside the San Juan metro area, has a hospital-to-resident ratio of 1 to 150,415 and 2.1 hospital beds per 1,000 residents (table 10). In the United States, the residents per hospital rate is 55,760, and the beds per 1,000 residents rate is 2.9.<sup>57</sup>

TABLE 10

**Puerto Rican Hospitals by DS Region, 2014**

DS region	Hospitals			Hospital Beds			Population
	Number	Share of total (%)	Residents per hospital	Number	Share of total (%)	Beds per 1,000 residents	
Arecibo	7	11.9	64,134	935	10.3	2.1	448,935
Bayamón	4	6.8	150,415	797	8.8	1.3	601,660
Caguas	8	13.6	73,443	1228	13.5	2.1	587,547
Fajardo	3	5.1	26,399	329	3.6	4.2	79,197
Mayagüez/ Aguadilla	8	13.6	65,184	947	10.4	1.8	521,474
Ponce	9	15.3	60,968	1236	13.6	2.3	548,712
San Juan Metro	20	33.9	42,455	3600	39.7	4.2	849,106

Source: Authors' analysis of 2014 AHA Annual Survey data; US Census Bureau 2014c; "Regiones de Salud y Servicios Directos," Departamento de Salud de Puerto Rico, accessed September 30, 2016, <http://www.salud.gov.pr/Pages/Regiones-de-Salud-y-Servicios-Directos.aspx>.

**HEALTH CARE PROFESSIONALS**

According to the Association of American Medical Colleges, Puerto Rico had 8,195 active physicians who engaged in patient care in 2014 (230.9 physicians per 100,000 inhabitants). Primary care physicians constituted about 44 percent of that total, and general surgeons 2 percent. While Puerto Rico's supply of physicians and general surgeons<sup>58</sup> closely parallels that of the United States overall, Puerto Rico has more primary care physicians per 100,000 inhabitants (table 11; AAMC 2015a).

TABLE 11

**Active Direct Care Physicians in Puerto Rico and the United States by Type, 2012–14**

Physician type	Number of physicians		Physicians per 100,000 residents in Puerto Rico		Physicians per 100,000 residents in the United States	
	2012	2014	2012	2014	2012	2014
Primary care physicians	3,643	3,580	99.3	100.9	80.7	82.5
General surgeons	N/A	232	N/A	6.5	N/A	6.9
<i>All physicians</i>	8,310	8,195	226.6	230.9	225.6	234.7

Source: AAMC 2013, 2015b.

Primary care is available to Puerto Ricans through several types of organizations. Most patients enrolled in commercial and MA plans receive primary care from primary care providers located in small independent practices. Patients enrolled in Mi Salud generally receive care through independent practice associations. FQHCs, which are also credentialed as IPAs, provide primary care to the Mi Salud

patient population as well. Ninety percent of their patient population is covered by Medicaid or Medicare Platino plans or lack coverage entirely (Levis-Peralta et al. 2016). Puerto Rico has 20 FQHCs with 84 service delivery sites. These FQHCs, which receive Section 330 funding, provide care to over 330,000 people and offer a range of services, including prenatal care and primary care services.<sup>59</sup>

Medicaid MCOs reimburse IPAs using subcapitation payment arrangements that transfer significant financial risk from the MCOs to the IPAs (Levis-Peralta et al. 2016). IPAs receive a per member per month payment that, according to one site visit respondent, covers primary care, hospital admissions, ancillary services, and specialty care, among other services. FQHCs receive supplemental payments from the commonwealth for services provided to Medicaid beneficiaries (Cohen and Ghiladi 2008). According to one respondent, low Medicaid per member per month payments are discouraging IPAs from providing some preventive care and from referring their patients to specialists in some instances. The same site visit respondent also indicated that IPAs that are not FQHCs view FQHCs as competition and are frustrated that FQHCs receive additional federal financial support despite delivering the same services.

The Health Resources and Services Administration (HRSA) within the US Department of Health and Human Services has determined that Puerto Rico has 88 Health Professional Shortage Areas (HPSAs). HPSAs are geographic areas designated by HRSA as having a shortage of primary medical care, dental, or mental health providers.<sup>60</sup> Of Puerto Rico's 78 municipalities, 42 have at least one HPSA. Twelve municipalities have four or more HPSAs, and one municipality has seven HPSAs.<sup>61</sup> Fifteen of Puerto Rico's municipalities have at least one provider who is a National Health Service Corps (NHSC) scholarship awardee or loan repayer. The NHSC places health care professionals in areas of need. Those providers in turn receive scholarships from NHSC or participate in an NHSC loan repayment program.<sup>62</sup> HRSA has also determined that Puerto Rico has 72 medical underserved areas (MUAs), which are geographic areas where residents have a shortage of health services (HRSA n.d.).<sup>63</sup>

According to several site visit respondents, the lack of physician assistants (PAs) in Puerto Rico is aggravating its health care provider shortages. Puerto Rico does not have a PA program and prohibits PAs from practicing medicine in the commonwealth. Several respondents said that the Puerto Rican medical community historically has resisted the use of PAs. Puerto Rico passed a law prohibiting PAs from practicing medicine two decades ago, at a time when the commonwealth had a surplus of physicians. Physicians were concerned that insurers would insist that PAs assume responsibilities typically shouldered by physicians.

Some respondents felt that it might be more feasible to develop Puerto Rican training programs for nurse practitioners (NPs) rather than try to overturn the law prohibiting PAs from practicing medicine. Puerto Rico recently passed a law permitting NPs to practice, but the corresponding regulations are not yet complete. Though a couple of schools in Puerto Rico train NPs, most graduates leave Puerto Rico after graduation. Like PAs, NPs face resistance from the medical community because physicians view NPs as competitors.

Several sources discussed a recent uptick in the number of health care professionals migrating from the commonwealth, often to the US mainland. Although they did not specifically define the term “health care professionals,” these sources offered a variety of estimates of the number of migrating health care professionals. One report found that from 2007 to 2010, Puerto Rico experienced a net loss of 204 health care professionals (1 percent of health practitioners and technical occupations; BLS 2007; Velázquez-Estrada 2015). Another report found that between 2010 and 2012, more than 4,000 health professionals, or about 9 percent of health care practitioners and technical occupations, migrated to the US mainland (BLS 2010; Shin et al. 2015). A third report found that Puerto Rico experienced a net loss of 2,132 health care professionals, or 4 percent of health care practitioners and technical occupations, in 2014 alone (PRBLS 2014b; Velázquez-Estrada 2016).

Another set of sources focused on the commonwealth’s loss of physicians due to migration. The AAMC estimates that 361 physicians moved from Puerto Rico in 2014 (Roman 2015). Another source reported that Puerto Rico had lost more than 3,000 physicians in five years, and that the commonwealth continues to lose almost 400 physicians each year (Michelson 2015). In 2013, NBC News reported that the number of physicians in Puerto Rico had decreased by 13 percent (from 11,397 to 9,950) over the previous five years, based on estimates from Puerto Rico’s Medical Licensing and Studies Board. The report stated that primary care physicians and subspecialties (e.g., thoracic oncologists) lost the largest numbers. Other specialties with significant reductions over that period include cardiologists (from approximately 400 to 150) and anesthesiologists (from 300 to 100).<sup>64</sup>

Reasons cited for the recent surge in physician migration include increased demand on the US mainland for bilingual health care physicians and the desire among physicians to increase their income (Michelson 2015; Portela and Sommers 2015).<sup>65</sup> According to US Bureau of Labor Statistics data, the average annual salaries for primary care physicians, pediatricians, dentists, and certain specialty physicians are significantly lower in Puerto Rico than they are in Florida, Mississippi, or the United States as a whole. Table 12 provides salary information on select physician types.



TABLE 12

**Average Annual Salaries for Select Physician Types, 2015**

	<b>Puerto Rico</b>	<b>Florida</b>	<b>Mississippi</b>	<b>National</b>
Anesthesiologist	\$77,510	\$250,480	\$174,900	\$258,100
Dentist	\$62,350	170,270	\$178,610	\$172,350
Family or general practitioner	\$73,300	\$197,090	\$223,250	\$192,120
General internist	\$75,920	\$205,460	\$240,780	\$196,520
Obstetrician/gynecologist	\$101,310	\$243,560	\$270,510	\$222,400
Pediatrician	\$66,930	\$186,540	\$266,040	\$183,180
Pharmacist	\$81,590	\$116,110	\$120,300	\$119,270
Psychiatrist	\$181,550	\$161,600	\$222,040	\$193,680

Source: BLS 2015a.

A study exploring job satisfaction and desire for relocation among pediatric dentists in Puerto Rico found that 57 percent of pediatric dentists participating in the survey had considered moving to the continental United States. Their most commonly cited reasons were safety, quality of life, and income. The authors of the study speculated that the continued migration of young professionals to the US mainland could contribute to lower birthrates and lower demand for pediatric dental services in the future, and that this scenario could encourage additional migration of pediatric dentists to the US mainland (Arévalo et al. 2015).

Over the past two decades, MCOs in Puerto Rico have filed several complaints with the Federal Trade Commission charging physician violations of federal antitrust laws. One complaint from several years ago stated that eight independent nephrologists were jointly negotiating and fixing prices with a Medicaid MCO to raise their compensation and terminated their contracts with that MCO when an agreement could not be reached. Similar complaints filed over the past two decades involve an association of about 500 optometrists, an association of about 30 endodontists, and an association of about 1,800 dentists (Meier, Albert, and Brau 2016).

Available research on the future supply and demand of physician services in Puerto Rico offers a mixed outlook for the commonwealth's ability to provide health care to its population. Although the supply of health care professionals—and physicians more specifically—is declining because of migration, the general population is also migrating to the US mainland in larger numbers. In a 2013 study, Puerto Rico's DS examined the implications of the commonwealth's declining physician supply in the context of Puerto Rico's broader population loss and questioned whether Puerto Rico would have the appropriate mix of physicians to meet the health care needs of its remaining population. DS projected that general practitioners and specialists would grow at a decreasing rate and that the demand for physician services to treat obesity and diabetes would outstrip the supply of those available to treat those conditions. However, the report also found that Puerto Rico would have sufficient specialists to care for

commonwealth residents suffering from Alzheimer's and depression (Alameda Lozada 2013). One note of caution: the study's projections begin in 2013, relying on data that is even older, and thus may not fully capture Puerto Rico's more recent—and significant—migratory trends.

## MEDICAL TOURISM

According to a report prepared for Puerto Rico's Department of Economic Development and Commerce, Puerto Rico is a major medical tourism destination for residents of the US Virgin Islands and other parts of the Caribbean but has had less success attracting patients from the US mainland and other regions of the world (Advantage Business Consulting 2015). NBC News reported in 2013 that US mainland residents who travel to Puerto Rico for medical care typically want cosmetic care, and patients from other parts of the Caribbean are seeking care that is not available closer to their home (e.g., endocrinology care).<sup>66</sup> To promote medical tourism, Puerto Rico created an interagency group that includes the DS, the US State Department, the Puerto Rico Department of Economic Development and Commerce, the Puerto Rico Tourism Company, the Puerto Rico Trade and Export Company, the Puerto Rico Hospital Association, and the Foundation for Puerto Rico (PRBLS 2014a). In addition, the Puerto Rico Medical Tourism Corporation, a subsidiary of the Puerto Rico Tourism Company, began a partnership with an organization (Nueterra Global Alliance) that provides medical tourism services around the globe in 2015.<sup>67</sup> Some Puerto Rican hospitals are also making personnel and facility investments to accommodate the medical tourism market (Advantage Business Consulting 2015).

## INFECTIOUS DISEASE SURVEILLANCE

Infectious disease surveillance programs can help governments monitor trends and identify risk factors for developing certain diseases. Our review found that the Puerto Rican government engages in surveillance of some common diseases. For example, because of the commonwealth's history of dengue outbreaks, the DS, in collaboration with the Puerto Rico-based Dengue Branch of the CDC, has conducted laboratory-based passive dengue surveillance across the entire commonwealth for the past three decades; DS has taken the lead in this effort since 2012. Puerto Rican law requires reporting of dengue fever and dengue hemorrhagic fever (CDC 2011), and the surveillance program relies on provider reporting of dengue cases. However, a recent study found that Puerto Rican providers significantly underreport suspected cases of dengue to public health officials (Tomashek et al. 2014); this finding is consistent with other studies of dengue in Puerto Rico (Noyd and Sharp 2015; Tomashek et al. 2014). In 2014, the DS and the CDC began using their passive dengue surveillance system to track chikungunya in Puerto Rico, following the first locally acquired case of the disease in the western hemisphere in December 2013 (Sharp et al. 2014). The CDC added Zika virus reporting and diagnostic

testing to that surveillance system after Puerto Rico's first case of local transmission in December 2015 (Dirlikov et al. 2016).

Past research has identified additional gaps in disease surveillance in the commonwealth. A 2015 surveillance study on human papillomavirus—the most common sexually transmitted infection in the world—found that a comprehensive HPV surveillance program of Puerto Rico did not exist, and that Puerto Rico lacked sufficient information about the prevalence and incidence of HPV infection (Ortiz et al. 2015). The study also noted that the only surveillance survey of adults fielded in Puerto Rico annually (BRFSS) does not collect biological samples, which can provide more accurate information about the prevalence and distribution of diseases. The National Health and Nutrition Examination Survey, which does collect biological samples, is not fielded in Puerto Rico. Another recent study found that Puerto Rico lacks an effective surveillance system for hepatitis C, the most common blood-borne infection in the United States, despite a mandatory reporting requirement (Pérez, Albizu-García, and Torres 2015).

## Conclusion

As a territory of the United States, the Commonwealth of Puerto Rico faces some unique challenges, which affect the health of Puerto Rico's residents and their access to high-quality medical services. For more than a decade, Puerto Rico has experienced an economic decline and a concomitant increase in net emigration. These emigrants tend to be young high school graduates from households living above the federal poverty level (Velázquez-Estrada 2016). The population remaining in Puerto Rico is, as a result, becoming older.

The primary health concerns of this older adult population include five leading causes of death—cancer, diseases of the heart, diabetes, Alzheimer's disease, and cardiovascular disease—as well as chronic conditions that are more prevalent in the commonwealth than on the US mainland (e.g., asthma, diabetes, and hypertension). These health concerns highlight the need for oncology, cardiovascular, and endocrinology services in Puerto Rico. Additionally, with infant mortality rates and premature birth rates substantially above the US average, access to prenatal care services must be improved in Puerto Rico. Finally, the commonwealth's location in the Caribbean affects the health of Puerto Ricans both young and old. Puerto Rico is often on the front lines of exposure to vector-borne diseases such as dengue, chikungunya, and Zika. Consequently, strong disease surveillance programs in the commonwealth could help maintain the health of Puerto Rico's residents and provide a first line of defense to the US mainland.

The majority (94 percent) of Puerto Rico's population is insured (US Census Bureau 2014a), but the commonwealth relies much more heavily on public coverage than the US mainland does. In Puerto Rico, and especially outside of the San Juan metropolitan area, access to care seems to be limited primarily by a lack of available health care facilities and providers. Thirty-four percent of the commonwealth's hospitals are located in the San Juan metro area (PAHO 2007). Puerto Rico has 88 Health Professional Shortage Areas and a corresponding 72 medically underserved areas designated by HRSA.<sup>68</sup>

As a territory rather than a state, Puerto Rico receives significantly less funding for its public health insurance programs, is not covered by private insurance patient protection provisions of the ACA, and does not have access to subsidized Marketplace coverage. In addition, differences in program administration and eligibility rules for Medicare mean that Puerto Rican residents currently incur over \$7 million per year in late enrollment penalties (Mach et al. 2016; Portela and Sommers 2015). Until health care finance systems in Puerto Rico become stronger, there will be pressure on the commonwealth to reduce investments in Puerto Rico's health infrastructure, and on health professionals and individuals to continue moving to the US mainland.

All available evidence suggests that Puerto Rico is losing health professionals. They are moving to the US mainland for a better quality of life with higher incomes. However, even after accounting for expansions in health insurance coverage that could increase demand for health care services, Puerto Rico may not have net shortages of physicians, even in primary care, because its population is declining. However, physicians seem to be poorly distributed across Puerto Rico, with a surplus in the San Juan metro area relative to demand and shortages in outlying areas (Alameda Lozada 2013). Puerto Rico may have a shortage of endocrinologists, relative to the prevalence of diabetes there. Obstetricians/gynecologists, oncologists, and cardiologists may also be in short supply, although this has not yet been evaluated.

Common measures of access to care (e.g., having a usual source of care, having an annual check-up, and receiving recommended health screenings) suggest that as of 2014, Puerto Ricans had not yet experienced diminished access to care as a result of shortages of health professionals (CDC 2014a; Portela and Sommers 2015). Nevertheless, indicators of access and quality will need to be monitored closely in the coming years.

# Notes

1. Stephen Mihm, "Congress Goofed. Puerto Rico Pays," *Bloomberg View*, December 3, 2015, <http://www.bloombergview.com/articles/2015-12-03/bankruptcy-was-option-for-puerto-rico-before-congress-goof>.
2. "Puerto Rico Economic Facts," Government Development Bank for Puerto Rico, <http://www.gdb-pur.com/economy/fact-sheet.html>.
3. Michelle Kaske and Tatiana Darie, "Puerto Rico's Slide," *Bloomberg QuickTake*, updated December 23, 2016, <https://www.bloomberg.com/quicktake/puerto-ricos-slide>.
4. Where possible, we tried to corroborate information from media sources with peer-reviewed or gray literature.
5. In 1998, the AFASS was dissolved and the administration of all remaining public health care facilities was returned to the Puerto Rico Department of Health.
6. Medicaid is a public health insurance program for low-income people, and CHIP is a public health insurance program for children (from birth to age 19) in families with incomes too high to qualify for Medicaid but who can't afford private coverage; both Medicaid and CHIP are administered by states and territories. Medicare is a public health insurance program for people ages 65 and older and younger people with disabilities and end-stage renal disease; it is administered by the US federal government. Medicare includes Part A coverage for hospital care, Part B coverage for physician services, Part C coverage for Part A and Part B benefits through a managed care plan (optional; also known as Medicare Advantage), and Part D coverage for prescription drugs (optional). In Puerto Rico, Medicare Platino plans are Medicare Advantage plans for individuals who are dually eligible for Medicare and Medicaid.
7. For a map of DS service areas, see "Regiones de salud y servicios directos," Puerto Rico Departamento de Salud, <http://www.salud.gov.pr/Pages/Regiones-de-Salud-y-Servicios-Directos.aspx>. For a map of ASES service areas, see "Regiones," Molina Healthcare of Puerto Rico, <http://www.psgmolinahealthcare.com/es/Pages/regions.aspx>. ASES service areas include an additional "virtual region" serving children in foster care who are in the custody of the Administración de Familias y Niños and certain survivors of domestic violence (Sebelius 2013).
8. "Health Expenditure, Total (% of GDP)," World Health Organization Global Health Expenditure database, *World Bank Open Data*, <http://data.worldbank.org/indicator/SH.XPD.TOTL.ZS>.
9. "US mainland" refers to the 50 US states and the District of Columbia.
10. "Puerto Rico," in *World Factbook* (Washington, DC: Central Intelligence Agency), <https://www.cia.gov/library/publications/the-world-factbook/geos/rq.html>.
11. Data reported are crude rates not adjusted for age differences between the populations of Puerto Rico and the US mainland.
12. Hypertension data come from the 2013 Behavioral Risk Factor Surveillance System (BRFSS). Hypertension data were not collected by BRFSS in 2014.
13. "2013 Child Asthma Data: Prevalence Tables," CDC, last updated March 20, 2015, <https://www.cdc.gov/asthma/brfss/2013/child/tableC1.htm>.
14. "List of Countries by Incidence of Type 1 Diabetes Ages 0 to 14," Diabetes UK, published January 2, 2013, [https://www.diabetes.org.uk/About\\_us/News\\_Landing\\_Page/UK-has-worlds-5th-highest-rate-of-Type-1-diabetes-in-children/List-of-countries-by-incidence-of-Type-1-diabetes-ages-0-to-14/](https://www.diabetes.org.uk/About_us/News_Landing_Page/UK-has-worlds-5th-highest-rate-of-Type-1-diabetes-in-children/List-of-countries-by-incidence-of-Type-1-diabetes-ages-0-to-14/).

15. "Chikungunya Virus: Symptoms, Diagnosis, and Treatment," CDC, last updated April 6, 2016, <http://www.cdc.gov/chikungunya/symptoms/index.html>.
16. "Zika Virus: Case Counts in the US," CDC, accessed September 1, 2016, <http://www.cdc.gov/zika/geo/united-states.html>.
17. "Other Sexually Transmitted Diseases: Human Papillomavirus," CDC, last reviewed November 17, 2015, <http://www.cdc.gov/std/stats14/other.htm#hvpv>.
18. Kaiser Commission on Medicaid and the Uninsured, "8 Questions and Answers about Puerto Rico," updated September 26, 2016, <http://kff.org/disparities-policy/fact-sheet/8-questions-and-answers-about-puerto-rico/>.
19. As of 2015, ASES contracted with five managed care organizations (MCOs) to serve both the traditional Medicaid programs and those funded only by the commonwealth. First Medical Health Plan Inc. serves the San Juan, North, and virtual regions. Triple-S Salud serves the Metro North and West regions (see ASES website). Molina Healthcare of Puerto Rico serves the Southwest and East regions. PMC Medicare Choice serves the Southeast region, and MMM Multi Health serves the Northeast region. ASES also contracts with a single pharmacy benefit manager, MC-21, to serve all the regions. In addition, mental health and substance abuse coverage is carved out and provided by APS Healthcare for all regions.
20. "History of Poverty Thresholds," summary of Gordon M. Fisher, "The Development and History of the Poverty Thresholds," *Social Security Bulletin* 55 (4): 3–14, <https://aspe.hhs.gov/history-poverty-thresholds>.
21. The Instituto de Estadísticas de Puerto Rico (IEPR) recently collaborated with the Council for Community and Economic Research (C2ER) to create a cost-of-living index allowing for comparison of the cost of living in the San Juan-Carolina-Caguas metropolitan area relative to the US mainland. The index is based on a basket of goods and services typically purchased by affluent professional and managerial households. Based on estimates from these data, the overall cost of living in the San Juan area of Puerto Rico was 12 percent higher than the cost of living on the US mainland. According to the index, food costs 25 percent more in Puerto Rico, housing costs 4 percent less, utilities cost 58 percent more, transportation costs 3 percent less, and miscellaneous goods and services cost 12 percent more. Health care services are estimated to be 66 percent lower in Puerto Rico. However, the estimated cost of health care services is based only on an annual eye exam, an annual dental cleaning, a routine 15-minute doctor visit for a problem of low to moderate severity, the cost of Advil, and the cost of 5 insulin pens for individuals with no insurance (C2ER 2015).
22. "Poverty Guidelines," US Office of the Assistant Secretary for Planning and Evaluation, posted January 25, 2016, <https://aspe.hhs.gov/poverty-guidelines>.
23. The President's FY17 Budget includes a proposal to expand eligibility for Puerto Rico's traditional Medicaid program to 100 percent of the FPL. Together with other proposed changes, this would reduce the fiscal burden on the commonwealth to cover the cost of both its traditional Medicaid beneficiaries and its commonwealth-funded Medicaid beneficiaries.
24. 133 percent of the Puerto Rican poverty level is equivalent to 50 percent of the FPL.
25. "Preguntas frecuentes," Departamento de Salud de Puerto Rico, <https://www.medicaid.pr.gov/FAQ.aspx>.
26. According to Arbona and Ramírez de Arellano (1978), the original 1965 FMAP was set at 50 percent with a ceiling because of lobbying efforts by the Puerto Rico Medical Association, which wanted to retain privately funded clients and restrain the amount and use of public funds for medical care. After Medicaid and Medicare were established, primary care physicians began to reduce their employment in the commonwealth's municipal diagnostic and treatment centers and set up private clinics to serve Medicaid and Medicare clients (Arbona and Ramírez de Arellano 1978). Others have argued that FMAPs for Puerto Rico and other US territories were set to the lowest FMAP level for the states (50 percent) because residents of Puerto Rico and some other territories do not pay federal income tax on income earned in the territory unless they are employees of the US government (Kerr et al. 2010).

27. This enhanced FMAP applies to states that had already begun to implement the ACA Medicaid expansion at the time of the law's enactment and is unrelated to the Supreme Court decision that shifted the law's Medicaid expansion from mandatory to optional for states.
28. Kaiser Commission, "Puerto Rico."
29. The President's FY17 Budget includes a proposal to immediately raise the FMAP in Puerto Rico and other US territories to 60 percent and gradually increase the FMAP to 83 percent after the initial increase. US Department of Health and Human Services, "HHS Fact Sheet: Working to Solve the Health Care Challenges in Puerto Rico," news release, October 17, 2016, <https://www.hhs.gov/about/news/2016/10/17/hhs-fact-sheet-working-solve-health-care-challenges-puerto-rico.html>.
30. The President's FY17 Budget includes a proposal to lift the federal cap on Medicaid funding to Puerto Rico and other US territories. HHS, "Fact Sheet."
31. Kaiser Commission, "Puerto Rico."
32. "HHS FY 2017 Budget in Brief - CMS - Medicaid," HHS Office of Budget, last reviewed February 12, 2016, <https://www.hhs.gov/about/budget/fy2017/budget-in-brief/cms/index.html>; and Kaiser Commission, "Puerto Rico."
33. Puerto Rico restricts eyeglass benefits to children under age 21 (through the Early and Periodic Screening, Diagnostic and Treatment benefit).
34. James P. O'Drobinak, David Rodríguez, Víctor Ramos, Joaquín Vargas, Ramón Alejandro Pabón, Elliot Pacheco, Dennis Rivera, et al., "A Letter from the Puerto Rico Healthcare Community to the PROMESA Economic Development Task Force Members," July 29, 2016, <http://nebula.wsimg.com/40c152a8cf911d5e18ea1707218ea39d?AccessKeyId=C2485EFE08948AE5AAE0&disposition=0&alloworigin=1>.
35. O'Drobinak et al., "Letter."
36. This estimate for annual Medicare spending per enrollee in Puerto Rico is based on a calculation of Medicare Advantage spending by every managed care company reporting Medicare Net Premium to the PR Office of the Insurance Commissioner in corporate reports submitted in 2014, CMS Medicare FFS 2013 data for Part A and Part B total reimbursement and enrollment, and Medicare Advantage/Part D monthly enrollment data by contract/plan/state/county for December 2014. In this analysis, Medicare FFS 2013 data was used as a proxy for 2014 data because 2014 data are not yet available and trends for Medicare FFS have shown little variation over the past two years.
37. "Acute Inpatient Prospective Payment System, FY 2017 Final Rule and Correction Notice Data Files," CMS, last modified August 15, 2016, <https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/FY2017-IPPS-Final-Rule-Home-Page-Items/FY2017-IPPS-Final-Rule-Data-Files.html>; "CMS-1631-FC: Revisions to Payment Policies under the Physician Fee Schedule and Other Revisions to Part B for CY 2016," CMS, published November 16, 2015, <https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/PhysicianFeeSched/PFS-Federal-Regulation-Notices-Items/CMS-1631-FC.html>; and Maria Levis, "The Price of Inequality for Puerto Rico," *Health Affairs Blog*, December 29, 2015, <http://healthaffairs.org/blog/2015/12/29/the-price-of-inequality-for-puerto-rico/>.
38. "Puerto Rico - Medicare Spending and Usage," HealthGrove, <http://medicare-usage.healthgrove.com/l/2350/Puerto-Rico>.
39. Puerto Rico Healthcare Crisis Coalition, "Puerto Rico Healthcare Crisis Coalition Commends Resident Commissioner Pierluisi for Introducing Comprehensive Bill to Fix Island's Healthcare Disparities," news release, June 3, 2015, <http://puertoricohealthcarecrisis.com/2015/06/03/puerto-rico-healthcare-crisis-coalition-commends-resident-commissioner-pierluisi-for-introducing-comprehensive-bill-to-fix-islands-healthcare-disparities/>.



40. "Acute Inpatient Prospective Payment System," CMS.
41. "CMS-1631-FC," CMS; and "Physician Payments to Increase under Medicare," *Puerto Rico Report*, posted November 3, 2016, <http://www.puertoricoreport.com/physician-payments-increase-medicare/>.
42. Xavira Negggers Crescioni, "CMS Reduces Cuts to MA Funding, Leaving Puerto Rico Healthcare Industry Unscathed," *Caribbean Business*, April 17, 2014.
43. Michael A. Fletcher, "Already Deep in Debt, Puerto Rico Now Faces a New Crisis," *Washington Post*, May 26, 2015, <https://www.washingtonpost.com/news/wonk/wp/2015/05/26/already-deep-in-debt-puerto-rico-now-faces-a-new-crisis/>.
44. CMS, "Supporting Medicare in Puerto Rico," news release, April 4, 2016, <https://www.cms.gov/Newsroom/MediaReleaseDatabase/Fact-sheets/2016-Fact-sheets-items/2016-04-04-2.html>.
45. "Best Puerto Rico Medicare Advantage Plans," HealthGrove, <http://medicare-advantage-plans.healthgrove.com/d/a/Puerto-Rico>.
46. Kaiser Commission, "Puerto Rico."
47. "Finding Health Insurance," *Living in Puerto Rico*, posted December 30, 2014, <http://livinginpuertorico.com/health-insurance-puerto-rico>.
48. Kaiser Commission, "Puerto Rico."
49. Danica Coto, "Doctors Flee Puerto Rico for US Mainland," *NBC News*, April 17, 2013, <http://nbclatino.com/2013/04/17/doctors-flee-puerto-rico-for-us-mainland/>.
50. Martin Z. Braun, "Puerto Rico Says Sick Will Head North without Health-Care Fix," *Bloomberg*, December 7, 2015, <http://www.bloomberg.com/news/articles/2015-12-07/puerto-rico-says-sick-will-head-north-without-health-care-fix>.
51. Edison Reynaldo Misla, "US Sen. Bill Nelson Seeks to Expand Medicare Part D Program to Puerto Rico," *Caribbean Business*, December 10, 2015.
52. "Human Papillomavirus," CDC.
53. Measures included hemoglobin A1c control, retinal eye examination, low-density lipoprotein cholesterol control, nephropathy screening, blood pressure control, cardiovascular disease (including low-density lipoprotein cholesterol control, blood pressure control, and use of a beta blocker after myocardial infarction), cancer screening (colorectal and breast), and appropriate medications (including systemic corticosteroids and bronchodilators for chronic obstructive pulmonary disease and disease-modifying antirheumatic drugs).
54. Using five criteria (disease prevalence and morbidity/mortality in Medicare population, strong scientific evidence, reliability, presence of performance gap, ability to intervene), researchers developed 24 process-of-care measures related to primary or secondary prevention or treatment of AMI, breast cancer, diabetes mellitus, heart failure, pneumonia, and stroke. The 24 measures include most of the Healthcare Effectiveness Data and Information Set clinical measures but cover more conditions and measure more elements of care in addition to addressing FFS Medicare.
55. Levis-Peralta and colleagues (2016) reported that Puerto Rico had 67 operating hospitals in 2013, using data provided by DS.
56. Additional information about CAHs is available at "What Are Critical Access Hospitals (CAH)?," US Department of Health and Human Services, <http://www.hrsa.gov/healthit/toolbox/RuralHealthITtoolbox/Introduction/critical.html>.
57. American Hospital Association, "Fast Facts on US Hospitals," January 2016, <http://www.aha.org/research/rc/stat-studies/fast-facts2016.shtml>.



58. For information on the availability of other specialty physicians, see “Puerto Rico Physician Workforce Profile,” Association of American Medical Colleges, <https://www.aamc.org/download/359280/data/puertorico.pdf>.
59. US Department of Health and Human Services, “HHS Awards \$5 Million to Puerto Rico Health Centers to Fight the Spread of Zika Virus,” news release, April 26, 2016, <http://www.hhs.gov/about/news/2016/04/26/hhs-awards-5-million-to-puerto-rico-health-centers.html>; and “Number of Federally-Funded Federally Qualified Health Centers,” Kaiser Family Foundation, <http://kff.org/other/state-indicator/total-fqhcs/>.
60. A primary care HPSA must have a ratio of 3,500 inhabitants to 1 full-time-equivalent primary care physician, though exceptions and other criteria are considered. Complete definitions and criteria for primary HPSAs, dental HPSAs, and mental health HPSAs are available at “Health Professional Shortage Area (HPSA) Application and Scoring Process,” US Health Resources and Services Administration, <http://bhpr.hrsa.gov/shortage/hpsas/designationcriteria/designationcriteria.html>.
61. “Shortage Areas,” HRSA Data Warehouse, US Health Resources and Services Administration, <https://datawarehouse.hrsa.gov/topics/shortageAreas.aspx>.
62. More information on NHSC is available at “National Health Service Corps,” HRSA Data Warehouse, US Health Resources and Services Administration, <https://datawarehouse.hrsa.gov/topics/nhsc.aspx>.
63. “Medically Underserved Areas/Populations (MUA/P): State Summary of Designated MUA/P,” HRSA Data Warehouse, US Health Resources and Services Administration, [https://ersrs.hrsa.gov/ReportServer/Pages/ReportViewer.aspx?/HGDW\\_Reports/BCD\\_MUA/BCD\\_MUA\\_State\\_Statistics&rs:Format=PDF](https://ersrs.hrsa.gov/ReportServer/Pages/ReportViewer.aspx?/HGDW_Reports/BCD_MUA/BCD_MUA_State_Statistics&rs:Format=PDF). Additional information about the definition and criteria used to identify MUAs is available at “Medically Underserved Areas and Populations (MUA/Ps),” US Health Resources and Services Administration, <http://www.hrsa.gov/shortage/mua/>.
64. Coto, “Doctors Flee.”
65. Ibid.
66. Ibid.
67. “Seleccionada la compañía que coordinará servicios a pacientes de turismo médico en Puerto Rico,” *Diario de Puerto Rico* (blog), February 21, 2015, <http://diariodepuertorico.com/2015/02/seleccionada-la-compania-que-coordinara-servicios-a-pacientes-de-turismo-medico-en-puerto-rico/>.
68. “Shortage Areas,” HRSA Data Warehouse; and “MUA/P,” HRSA Data Warehouse.

# References

- AAMC (Association of American Medical Colleges Center for Workforce Studies). 2013. *Puerto Rico Physician Workforce Profile*. Washington, DC: AAMC.
- . 2015a. *2015 State Physician Workforce Data Book*. Washington, DC: AAMC.
- . 2015b. *Puerto Rico Physician Workforce Profile*. Washington, DC: AAMC.
- AARP. 2011. *Voices of 50+ Puerto Rico: Dreams and Challenges*. Washington, DC: AARP.
- Adams, Laura, Melissa Bello-Pagan, Matthew Lozier, Kyle R. Ryff, Carla Espinet, Jomil Torres, Janice Perez-Padilla, et al. 2016. “Update: Ongoing Zika Virus Transmission – Puerto Rico, November 1, 2015–July 7, 2016.” *Morbidity and Mortality Weekly Report* 65 (30): 774–79. Atlanta: CDC.
- Advantage Business Consulting. 2015. *Plan for a Medical Tourism Program in Puerto Rico*. San Juan, PR: Advantage Business Consulting.
- AHA (American Hospital Association). 2014. *AHA Annual Survey Database*. Chicago: AHA.
- Alameda Lozada, José I. 2013. *The Demand and Supply of Physicians in Puerto Rico: Historical Trends and Forecasting 2013 to 2019*. San Juan: Puerto Rico Department of Health.
- Arbona, Guillermo, and Annette B. Ramírez de Arellano. 1978. *Regionalization of Health Services: The Puerto Rican Experience*. New York: Oxford University Press.
- Arévalo, Oscar, Daniel M. Saman, Miguel Tabares, Ana Hernandez, and Rebecca Sanders-Ward. 2015. “Job Satisfaction and Relocation Desire among Pediatric Dentists in Puerto Rico.” *Puerto Rico Health Sciences Journal* 34 (4): 201–07.
- Arriola, Carmen S., Melissa C. Mercado-Crespo, Brenda Rivera, Ruby Serrano-Rodriguez, Nora Macklin, Angel Rivera, Samuel Graitcer, Mayra Lacen, Carolyn B. Bridges, and Erin D. Kennedy. 2015. “Reasons for Low Influenza Vaccination Coverage among Adults in Puerto Rico, Influenza Season 2013–2014.” *Vaccine* 33 (32): 3829–35.
- Ayala, César J. 1996. “The Decline of the Plantation Economy and the Puerto Rican Migration of the 1950s.” *Latino Studies Journal* 7 (1): 61–90.
- BLS (US Bureau of Labor Statistics). 2007. *Occupational Employment Statistics*. Washington, DC: BLS. Retrieved September 30, 2016.
- . 2010. *Occupational Employment Statistics*. Washington, DC: BLS.
- . 2015a. “May 2015 Occupation Profiles: Healthcare Practitioners and Technical Occupations.” *Occupational Employment Statistics*. Washington, DC: BLS.
- . 2015b. “May 2014 State Occupational Employment and Wage Estimates: Puerto Rico.” *Occupational Employment Statistics*. Washington, DC: BLS.
- . 2016. *Labor Force Statistics from the Current Population Survey*. Washington, DC: BLS.
- C2ER (Council for Community and Economic Research). 2015. *Cost of Living Index Manual*. Arlington, VA: C2ER.
- Calo, William A., Ana P. Ortiz, Vivian Colon-Lopez, Sarah Krasny, and Guillermo Tortolero-Luna. 2014. “Factors Associated with Perceived Patient-Provider Communication Quality among Puerto Ricans.” *Journal of Health Care for the Poor and Underserved* 25 (2): 491–502.

- Castro, Eida M., Julio C. Jiménez, Gwendolyn Quinn, Myra García, Yesenia Colón, Axel Ramos, Thomas Brandon, et al. 2015. "Identifying Clinical and Support Service Resources and Network Practices for Cancer Patients and Survivors in Southern Puerto Rico." *Support Care Cancer* 23 (4): 967–75.
- CDC (Centers for Disease Control and Prevention). 2011. "2010: Largest Dengue Outbreak in Puerto Rico History." *Dengue Update* 3 (1).
- . 2014a. "BRFSS Prevalence and Trends Data." Behavioral Risk Factor Surveillance System.
- . 2014b. "Flu Vaccination Coverage, United States, 2013–14 Influenza Season." FluVaxView.
- . 2015. "High School YRBS: Puerto Rico 2015 Results." Youth Risk Behavior Surveillance System.
- Chapin-Bardales, Johanna, Travis Sanchez, Gabriela Paz-Bailey, Kathy Hageman, Michael W. Spiller, Yadira Rolon-Colon, and Sandra Miranda de Leon. 2016. "Factors Associated with Recent Human Immunodeficiency Virus Testing among Men Who Have Sex with Men in Puerto Rico, National Human Immunodeficiency Virus Behavioral Surveillance System, 2011." *Sexually Transmitted Diseases* 43 (6): 346–52.
- CMS (Centers for Medicare and Medicaid Services). 2014. "Monthly Enrollment by Contract/Plan/State/County." Medicare Advantage/Part D Contract and Enrollment Data.
- . 2016. "Announcement of Calendar Year (CY) 2017 Medicare Advantage Capitation Rates and Medicare Advantage and Part D Payment Policies and Final Call Letter." Washington, DC: CMS.
- Cohen, Benjamin, and Kathy Ghiladi. 2008. "Recent Court Decisions Involving FQHC Payments and Methodology." Washington, DC: National Association of Community Health Centers.
- Cohn, D'Vera, Eileen Patten, and Mark Hugo Lopez. 2014. *Puerto Rican Population Declines on Island, Grows on US Mainland*. Washington, DC: Pew Research Center.
- Collins, Susan M., Barry P. Bosworth, and Miguel A. Soto-Class. 2006. *Restoring Growth in Puerto Rico: Overview and Policy Options*. Washington, DC: Brookings Institution Press.
- Colon-Burgos, Jose Felix, H. M. Colon-Jordan, V. E. Reyes-Ortiz, Heriberto A. Marin-Centeno, and R. Rios-Mota. 2013. "Disparities and Barriers Encountered by Immigrant Dominican Mothers Accessing Prenatal Care Services in Puerto Rico." *Journal of Immigrant and Minority Health* 16 (4): 646–51.
- Comisión para Evaluar el Sistema de Salud del Estado Libre Asociado de Puerto Rico. 2005. *Evaluación del Sistema de Salud de Puerto Rico*. San Juan: Comisión para Evaluar el Sistema de Salud del Estado Libre Asociado de Puerto Rico.
- Commonwealth of Puerto Rico. 2014. *Puerto Rico Medicaid Quality Strategy 2013–2016*. San Juan: Commonwealth of Puerto Rico.
- Departamento de Salud. 2015a. *Puerto Rico HIV/AIDS Surveillance Summary: Cumulative HIV/AIDS Cases Diagnosed as of December 31, 2015*. San Juan: Departamento de Salud de Puerto Rico.
- . 2015b. *Resumen General de la Salud en Puerto Rico*. San Juan: Departamento de Salud de Puerto Rico.
- . 2016a. *Informe Semanal de Vigilancia de Chikungunya*. San Juan: Departamento de Salud de Puerto Rico.
- Deren, Sherry, Camila Gelpí-Acosta, Carmen E. Albizu-García, Ángel González, Don C. Des Jarlais, and Salvador Santiago-Negrón. 2014. "Addressing the HIV/AIDS Epidemic among Puerto Rican People Who Inject Drugs: The Need for a Multiregion Approach." *American Journal of Public Health* 104 (11): 2030–36.
- Dirlikov, Emilio, Kyle R. Ryff, Jomil Torres-Aponte, Dana L. Thomas, Janice Perez-Padilla, Jorge Munoz-Jordan, Elba V. Caraballo, et al. 2016. "Update: Ongoing Zika Virus Transmission — Puerto Rico, November 1, 2015–April 14, 2016." *Morbidity and Mortality Weekly Report* 65 (17): 451–55. Atlanta: CDC.

- Elliott, Marc N., Amelia M. Haviland, Jacob W. Dembosky, Katrin Hambarsoomian, and Robert Weech-Maldonado. 2012. "Are There Differences in the Medicare Experiences of Beneficiaries in Puerto Rico Compared with Those in the US Mainland?" *Medical Care* 50 (3): 243–48.
- Federal Reserve Bank of New York. 2012. *Report on the Competitiveness of Puerto Rico's Economy*. New York: Federal Reserve Bank of New York.
- . 2014. *An Update on the Competitiveness of Puerto Rico's Economy*. New York: Federal Reserve Bank of New York.
- Fernández, María E., Yen-Chi L. Le, Natalie Fernández-Espada, William A. Calo, Lara S. Savas, Camille Vélez, Angela Pattatucci Aragon, and Vivian Colón-López. 2014. "Knowledge, Attitudes, and Beliefs about Human Papillomavirus (HPV) Vaccination among Puerto Rican Mothers and Daughters, 2010: A Qualitative Study." *Preventing Chronic Disease* 11 (E212).
- Fortuny, Karina, and Ajay Chaudry. 2011. *A Comprehensive Review of Immigrant Access to Health and Human Services*. Washington, DC: Urban Institute.
- GAO (US Government Accountability Office). 2010. *Oral Health: Efforts Under Way to Improve Children's Access to Dental Services, but Sustained Attention Needed to Address Ongoing Concerns*. Washington, DC: GAO.
- . 2014. *Puerto Rico: Information on How Statehood Would Potentially Affect Selected Federal Programs and Revenue Sources*. Washington, DC: GAO.
- . 2016. *Medicaid and CHIP: Increased Funding in US Territories Merits Improved Program Integrity Efforts*. Washington, DC: GAO.
- IOM (Institute of Medicine). 1993. *Access to Health Care in America*. Washington, DC: National Academy Press.
- . 2001. *Crossing the Quality Chasm: A New Health System for the 21st Century*. Washington, DC: National Academy Press.
- Jencks, Stephen F., Timothy Cuerdon, Dale R. Burwen, Barbara Fleming, Peter M. Houck, Annette E. Kusmaul, David S. Nilasena, Diana L. Ordin, and David R. Arday. 2000. "Quality of Medical Care Delivered to Medicare Beneficiaries: A Profile at State and National Levels." *JAMA* 284 (13): 1670–76.
- Jiménez, J., D. Rivera, P. Benítez, H. Tarrats, and A. Ramos. 2013. "Integrating Mental Health Services into a General Hospital in Puerto Rico." *Journal of Clinical Psychology in Medical Settings* 20 (3): 294–301.
- Kerr, James T., Nilsa Gutierrez, Michael Melendez, Peter Reisman, Reginald Slaten, and Iris Bermudez. 2010. *Commonwealth of Puerto Rico: Health Care System and Federal Health Care Financing*. New York, NY: CMS Region II.
- Krueger, Anne O., Ranjit Teja, and Andrew Wolfe. 2015. *Puerto Rico - A Way Forward*. San Juan: Government Development Bank for Puerto Rico.
- Langellier, Brent A., Molly A. Martin, Glorisa Canino, Jeremiah R. Garza, and Alexander N. Ortega. 2012. "The Health Status of Youth in Puerto Rico." *Clinical Pediatrics* 51 (6): 569–73.
- Levis-Peralta, María, Antonio Llompert, María Cecilia Rodríguez, Marie Cynthia Sanchez, Antonio Sosa-Pascual, Sarah Bliss Matousek, and Rosemarie Day. 2016. *Description of the State Health Care Environment: Puerto Rico State Health Innovation Plan*. Rio Piedras: Puerto Rico Department of Health.
- Lopez-Charneco, Magdalena, Cynthia M. Pérez, Marievelisse Soto-Salgado, Luis Rodríguez, Daisy González, Ruby Serrano, Marcia Cruz-Correa, and Ana Patricia Ortiz. 2013. "Correlates of Colorectal Cancer Screening among Hispanics: Results from the 2008 Puerto Rico Behavioral Risk Factor Surveillance System Survey." *Puerto Rico Health Sciences Journal* 32 (2): 68–75.

- Mach, Annie L., Patricia A. Davis, Sarah A. Donovan, Jim Hahn, Suzanne M. Kirchhoff, Alison Mitchell, Paulette C. Morgan, C. Stephen Redhead, and Scott R. Talaga. 2016. *Puerto Rico and Health Care Finance: Frequently Asked Questions*. Report R44275. Washington, DC: Congressional Research Service.
- MaCurdy, Thomas, K. Piccinini, M. Chou, S. Sherpa, A. Kamen, T. Bhuyain, and J. Rolnick. 2016. *Report on the CY 2017 Update of the Geographic Practice Cost Index for the Medicare Physician Fee Schedule*. Burlingame, CA: Acumen.
- Meier, Markus H., Bradley S. Albert, and Saralisa C. Brau. 2016. *Overview of FTC Actions in Health Care Services and Products*. Washington, DC: US Federal Trade Commission.
- Michelson, Shelley. 2015. *On Life Support: The Puerto Rico Healthcare Crisis*. New York: NewOak Capital.
- NORC Walsh Center for Rural Health Analysis and RUPRI Center for Rural Health Policy Analysis. 2008. "Critical Access Hospitals' Experiences with Medicare Advantage Plans."
- Noyd, David H., and Tyler M. Sharp. 2015. "Recent Advances in Dengue: Relevance to Puerto Rico." *Puerto Rico Health Sciences Journal* 34 (2): 65–70.
- Ortiz, Ana Patricia, Edmir Marrero, Cristina Muñoz, Cynthia M. Pérez, Guillermo Tortolero-Luna, Josefina Romaguera, Nahir Rodríguez, Andrea González-Falero, Joel Palefsky, and Erick Suárez. 2015. "Methods in HPV Surveillance: Experiences from a Population-Based Study of HPV Infection among Women in the San Juan Metropolitan Area of Puerto Rico." *Puerto Rico Health Sciences Journal* 34 (3): 117–27.
- Ortiz-Ortiz, Karen J., José J. Ortiz-Martínez de Andino, Carlos R. Torres-Cintrón, Maribel Tirado-Gómez, Andrea González-Falero, Daniela Caballero-Varona, Ana Patricia Ortiz, and Naydi Pérez-Ríos. 2014. "Effect of Type of Health Insurance Coverage on Leukemia Survival in Adults in Puerto Rico." *Puerto Rico Health Sciences Journal* 33 (3): 132–35.
- PAHO (Pan American Health Organization). 2007. *Health Systems Profile of Puerto Rico*. Washington, DC: PAHO.
- Pérez, Cynthia M., Carmen E. Albizu-García, and Esther A. Torres. 2015. "Tackling the Health Challenge Posed by Hepatitis C in Puerto Rico: A Call for Immediate Public Health Actions." *Puerto Rico Health Sciences Journal* 34 (2): 53–59.
- Portela, Maria, and Benjamin D. Sommers. 2015. "On the Outskirts of National Health Reform: A Comparative Assessment of Health Insurance and Access to Care in Puerto Rico and the United States." *Milbank Quarterly* 93 (3): 584–608.
- PRBLS (Puerto Rico Bureau of Labor Statistics). 2014a. *Puerto Rico Economic Analysis Report 2012–2013*. Hato Rey: PRBLS.
- . 2014b. *Puerto Rico Economic Analysis Report 2013–2014*. Hato Rey: PRBLS.
- President's Task Force on Puerto Rico's Status. 2011. *Report by the President's Task Force on Puerto Rico's Status*. Washington, DC: US Office of Intergovernmental Affairs.
- Reyes, Juan Carlos, Carola T. Sánchez-Díaz, Guillermo Tortolero-Luna, Hector M. Colón, and Ana Patricia Ortiz. 2015. "Demographic and High-Risk Behaviors Associated with HPV and HPV Vaccine Awareness among Persons Aged 15–74 Years in Puerto Rico." *Puerto Rico Health Sciences Journal* 34 (4): 195–200.
- Rivera-Hernandez, Maricruz, Bryan Leyva, Laura M. Keohane, and Amal N. Trivedi. 2016. "Quality of Care for White and Hispanic Medicare Advantage Enrollees in the United States and Puerto Rico." *JAMA Internal Medicine* 176 (6): 787–94.
- Rivero-Mendez, Marta, Erick L. Suárez-Pérez, and Solymar S. Solís-Báez. 2015. "Measuring Health Literacy among People Living with HIV Who Attend a Community-Based Ambulatory Clinic in Puerto Rico." *Puerto Rico Health Sciences Journal* 34 (1): 31–37.
- Roman, Jesse. 2015. "The Puerto Rico Healthcare Crisis." *Annals of the American Thoracic Society* 12 (12): 1760–63.

- Santos-Lozada, Alexis Raúl. 2012. "Transformations of Public Healthcare Services in Puerto Rico from 1993 until 2010." MA diss., University of Puerto Rico.
- Sebelius, Kathleen. 2013. *Report to the President's Task Force on Puerto Rico Status*. Washington, DC: US Department of Health and Human Services.
- Sharp, Tyler M., Nicole M. Roth, Jomil Torres, Kyle R. Ryff, Nicole M. Pérez Rodríguez, Chanis Mercado, Maria del Pilar Diaz Padró, et al. 2014. "Chikungunya Cases Identified through Passive Surveillance and Household Investigations — Puerto Rico, May 5–August 12, 2014." *Morbidity and Mortality Weekly Report* 63 (48): 1121–28. Atlanta: CDC.
- Shin, Peter, Jessica Sharac, Marie Nina Luis, and Sara Rosenbaum. 2015. "Puerto Rico's Community Health Centers in a Time of Crisis." Washington, DC: George Washington University Milken Institute School of Public Health, Department of Health Policy and Management.
- Spooner, Kiara K., Jason L. Salemi, Hamisu M. Salihu, and Roger J. Zoorob. 2016. "Disparities in Perceived Patient-Provider Communication Quality in the United States: Trends and Correlates." *Patient Education and Counseling* 99 (5): 844–54.
- Tomashek, Kay M., Brad J. Biggerstaff, Mary M. Ramos, Carmen L. Pérez-Guerra, Enid J. Garcia Rivera, and Wellington Sun. 2014. "Physician Survey to Determine How Dengue Is Diagnosed, Treated, and Reported in Puerto Rico." *PLOS Neglected Tropical Diseases* 8(10).
- Tossas-Milligan, Katherine Y., Robert F. Hunter-Mellado, Angel M. Mayor, Diana M. Fernández-Santos, and Mark S. Dworkin. 2016. "Late HIV Testing in a Cohort of HIV-Infected Patients in Puerto Rico." *Puerto Rico Health Sciences Journal* 35 (2): 113–21.
- US Census Bureau. 2010. "Median Age by Sex, 2006–2010 American Community Survey." [American FactFinder](#).
- . 2014a. "Health Insurance Coverage Status: 2014 American Community Survey 1-Year Estimates." [American FactFinder](#).
- . 2014b. "Selected Economic Characteristics: 2010–2014 American Community Survey 5-Year Estimates." [American FactFinder](#).
- . 2014c. "Age and Sex: 2010–2014 American Community Survey 5-Year Estimates." [American FactFinder](#).
- . 2015a. "Median Age by Sex, 2011–2015 American Community Survey 5-Year Estimates." [American FactFinder](#).
- . 2015b. "Cumulative Estimates of Resident Population Change for the United States, Regions, States, and Puerto Rico and Region and State Rankings: April 1, 2010, to July 1, 2015." Puerto Rico Commonwealth Population Totals Table 2.
- . 2015c. "Estimates of Resident Population Change for the United States, Regions, States, and Puerto Rico and Region and State Rankings: July 1, 2014, to July 1, 2015." Puerto Rico Commonwealth Population Totals Table 3.
- Velázquez-Estrada, Alberto L. 2015. *Perfil del migrante: 2013*. San Juan: Instituto de Estadísticas de Puerto Rico.
- . 2016. *Perfil del migrante: 2014*. San Juan: Instituto de Estadísticas de Puerto Rico.
- Xu, Jiaquan, Sherry L. Murphy, Kenneth D. Kochanek, and Brigham A. Bastian. 2016. "Deaths: Final Data for 2013." *National Vital Statistics Report* 64 (2).

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