



DIGITAL ACCESS TO
SCHOLARSHIP AT HARVARD
DASH.HARVARD.EDU



HARVARD LIBRARY
Office for Scholarly Communication

On the Outskirts of National Health Reform: A Comparative Assessment of Health Insurance and Access to Care in Puerto Rico and the United States

The Harvard community has made this article openly available. [Please share](#) how this access benefits you. Your story matters

Citation	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. <i>The Milbank Quarterly</i> 93 (3): 584-608.
Published Version	doi:10.1111/1468-0009.12138
Citable link	http://nrs.harvard.edu/urn-3:HUL.InstRepos:14085958
Terms of Use	This article was downloaded from Harvard University's DASH repository, and is made available under the terms and conditions applicable to Open Access Policy Articles, as set forth at http://nrs.harvard.edu/urn-3:HUL.InstRepos:dash.current.terms-of-use#OAP

On the Outskirts of National Health Reform:

**A Comparative Assessment of Health Insurance and Access to Care in Puerto Rico
and the United States**

Maria Portela, M.D., M.P.H., and Benjamin D. Sommers, M.D., Ph.D.

Harvard School of Public Health
Boston, Massachusetts

CORRESPONDING AUTHOR:
Benjamin D. Sommers, MD, PhD
677 Huntington Ave, Kresge Room 406
Boston, MA 02115
(617) 432-3271
bsommers@hsph.harvard.edu

Date: January 26, 2015

Publication Note:

This is a preprint of an electronic version of an Article published in *The Milbank Quarterly*, 93(3):584-608. Milbank Memorial Fund © 2015.

Acknowledgments:

We are grateful to Dr. Joxel Garcia for thoughtful feedback and advice on this manuscript and to Juliana Stone for excellent research assistance. Dr. Sommers' work on this project was supported in part by grant number K02HS021291 from the Agency for Healthcare Research and Quality (AHRQ). The authors have no financial conflicts of interest to report. Dr. Sommers serves part time in the Office of the Assistant Secretary for Planning and Evaluation at the Department of Health and Human Services (HHS). The views presented here are those of the authors and do not represent the views of HHS or AHRQ.

ABSTRACT

Context: Puerto Rico is the U.S.'s largest territory, home to nearly 4 million American citizens. Yet it has remained largely on the outskirts of U.S. health policy, including the Affordable Care Act (ACA). This paper presents an overview of Puerto Rico's health care system and a comparative analysis of coverage and access to care in Puerto Rico versus the mainland U.S.

Methods:

We analyzed 2011-2012 data from the Behavioral Risk Factor and Surveillance System, and 2012 data from the American Community Survey and its counterpart the Puerto Rican Community Survey. Among adults 18 and over, we examined the following outcomes: health insurance coverage; access measures such as having a usual source of care and cost-related delays in care; self-reported health; and the receipt of recommended preventive services such as cancer screening and glucose testing. We used multivariate regression models to compare Puerto Rico and the U.S., adjusted for age, income, race/ethnicity, and other demographic variables.

Findings: Uninsured rates were significantly lower in Puerto Rico (unadjusted 7.4% vs. 15%, adjusted difference -12.0%, $p < 0.001$). Medicaid was far more common in Puerto Rico. Puerto Rican residents were more likely than those in the mainland U.S. to have a usual source of care and a check-up within the past year, and fewer experienced cost-related delays in care. Screening rates for diabetes, mammograms, and Pap smears were comparable or better in Puerto Rico, while colonoscopy rates were lower. Self-reported health was slightly worse, while obesity and smoking rates were lower.

Conclusions: Despite its far poorer population, Puerto Rico outperforms the mainland U.S. on several measures of coverage and access. However, Congressional policies capping federal Medicaid funds to the territory have contributed to budgetary challenges. While the ACA significantly increases federal resources in Puerto Rico, ongoing restrictions on Medicaid funding and premium tax credits pose substantial health policy challenges in the territory.

Keywords: Puerto Rico, Access to Care, Health Insurance, Health Reform

INTRODUCTION

The Commonwealth of Puerto Rico is home to 3.6 million residents, 97% of them U.S. citizens, a population larger than that of approximately 20 states in the U.S.¹ Additionally, over 4.7 million Americans living in the 50 states are of Puerto Rican origin, and tens of thousands of people move back and forth between the territory and the mainland U.S. annually.² Yet, this large group of citizens has generally been an afterthought in American health policy, particularly in light of the major changes implemented under the Affordable Care Act (ACA). This paper presents an overview of Puerto Rico's health system and new analysis of current health care data, with a focus on health insurance coverage and access to care. Our objective was to provide insights into potential areas for federal policies to improve health care for the millions of American citizens living in Puerto Rico, as well as identify lessons that Puerto Rico's own health policy experiences may offer the rest of the mainland U.S.

Political and Economic Overview

Puerto Rico is by land area and population the largest of the five U.S. territories. Acquired by the U.S. in 1898 during the Spanish-American War, Puerto Ricans born on the island have been recognized as U.S. citizens since the Jones Act of 1917. As a commonwealth, Puerto Rico is subject to U.S. federal laws, but the island also has its own constitution. Demographically, 3.6 million Puerto Ricans live on the island, and over 4.7 million Latinos of Puerto Rican origin live in the mainland U.S.^{1,2} There are also approximately 100,000 foreign residents in the island, roughly two-thirds of whom are unauthorized immigrants.³ Puerto Ricans residing on the island

have different rights than those who reside in the mainland. Island Puerto Rican residents are allowed to vote in the primaries for U.S. presidential candidates but not national elections, and – as discussed below – often face significant limitations on their eligibility for public services available elsewhere in the mainland U.S.

Conversely, Puerto Rican residents in the mainland are entitled to full voting rights in all U.S. elections and as well as eligibility for public programs and subsidies, the same as any other U.S. citizen. In Congress, Puerto Ricans have a resident commissioner that advocates for the territory’s constituents but is not allowed to vote.

Economic conditions in Puerto Rico are worse than in any state in the U.S. For instance, in 2012, the poverty rate in Puerto Rico was over 45%, more than twice the level of Mississippi, the poorest state in the mainland U.S.⁴ As of 2012, Puerto Rico’s per capita income was slightly over \$19,000 compared to \$50,000 in the U.S.⁵ Income inequality in Puerto Rico is also a significant issue, with a Gini coefficient that exceeds all 50 states and the District of Columbia.⁵

Overview of Puerto Rico’s Health Care System

Similar to the mainland U.S., Puerto Rico’s health care system is funded by multiple sources, primarily a combination of private health insurance and public dollars from federal and state/territorial sources, described in further detail below. The health care system in Puerto Rico has undergone significant changes in the last 20 years. In 1993, Puerto Rico created La Reforma (“The Reform”), under the direction of Governor (and former physician) Pedro Rosselló. Prior to that, the Commonwealth had relied heavily on the direct provision of health care by government-owned public regional and

district hospitals, as well as municipal clinics. In part inspired by the Clinton health plan, Rosselló implemented reforms aimed at converting the Commonwealth's governmental role from one of direct provision of health care to instead serving primarily as a health insurer.⁶ In doing so, one of the reform's goals was to reduce disparities in access that critics attributed to the public provision of health care. By moving towards a health-insurance based model that utilized privately-employed providers, La Reforma was intended to give lower-income beneficiaries access to a broader array of primary and specialty physicians and to increase consumer choice.⁷ La Reforma further aimed to decrease bureaucracy and control costs by introducing managed care organizations administrating both public and private plans.⁸

Initial projections were that the reform would cost between \$860 million and \$1.3 billion per year. However, costs quickly topped \$1.4 billion per year and the government fell into an increasing deficit by the early 2000s.⁹ La Reforma was expanded and amended in 2011, and renamed Mi Salud ("My Health"). Mi Salud is now the umbrella for the Commonwealth's Medicaid, Children's Health Insurance Program (CHIP), and Medicare, and it also covers all the territory's government employees in the program.^{10,11} Overall, per capita health care spending in Puerto Rico (approximately \$3200) is just over one-third that of the U.S (\$8,900), according to 2012 statistics.^{12,13}

Here, we briefly highlight some of the key policy differences in the current insurance systems in Puerto Rico and in the mainland U.S.

Medicaid

Medicaid plays a large role in Puerto Rico's health care system, but it differs in several important ways from the program in the mainland U.S. Generally, states receive matching federal funds to cover between 50% and 83% of their Medicaid costs, depending on the state's Federal Matching Assistance Percentage (FMAP), a formula based on each state's share of the population living below the poverty level. Subject to broad federal guidelines for the program, states are able to spend as much as they see fit on Medicaid and receive their federal match in an open-ended fashion.¹⁴ Similarly, from the beneficiaries' vantage point, Medicaid is an "entitlement program": if they meet eligibility criteria for the program, they are generally guaranteed the right to enroll in the program and expenditures are not capped.

However, in Puerto Rico and other U.S. territories, the funding arrangement for Medicaid is quite different. In spite of high poverty levels, historically the territorial FMAP had been set at 50%, and more importantly, Congress caps the amount of spending eligible for federal reimbursement, meaning that Puerto Rico's Medicaid program essentially operates as a block grant and not as an entitlement program.¹⁵ Determined by Congress in the budget process, the annual federal spending caps for the territories generally have been far below total Medicaid spending, meaning that the actual contribution that the federal government has made to Medicaid programs in the territories — the true match rate — was far below 50 percent before the ACA. One estimate from 2005 is that the actual share of Puerto Rico's Medicaid costs reimbursed by the federal government was just 18%.¹⁵⁻¹⁷ In addition, Puerto Rico and the other territories are not eligible under current law to receive Medicaid Disproportionate

Share Hospital subsidies, which represents another important policy choice by Congress that limits the resources available in Puerto Rico's health care safety net.

Despite these federal funding constraints, Puerto Rico has aggressively offered coverage to its low-income population using Medicaid, far beyond what many mainland U.S. states had done prior to the ACA. Medicaid eligibility in Puerto Rico relies on a different income measure – the Commonwealth Poverty Level (which is roughly half the Federal Poverty Level, or FPL) – and the territory offered coverage to those with incomes up to 100% of the Commonwealth Poverty Level prior the ACA. Further broadening the program's reach compared to most states in the mainland U.S., Puerto Rico's Medicaid was available to non-disabled low-income adults without children (subject to citizenship requirements) – the so-called “childless adults” targeted by the ACA's Medicaid expansion.¹⁴ As discussed below, the ACA did not offer territories the same funding for the Medicaid expansion as is available to states. Nonetheless, since passage of the ACA, Puerto Rico has expanded Medicaid coverage up to 133% of the Commonwealth Poverty Level, which corresponds to roughly to 65-75% of the FPL.

Medicare

Unlike Medicaid, Medicare in Puerto Rico operates fairly similarly to how it functions in the mainland U.S., though with a much greater reliance on Medicare advantage plans – nearly 70% enrollment as of 2012.¹⁸ There is no funding cap, and beneficiaries are generally eligible for the same coverage as those receiving Medicare in the states. In addition, Puerto Rico does receive Medicare DSH payments, and

starting in fiscal year 2014, these payments to the Commonwealth have been increased substantially.¹⁹ However, there are some differences between Medicare in the mainland U.S. and in Puerto Rico. The low-income subsidy for Part D drug coverage is not an entitlement and instead operates as a territory-run block grant. Also, unlike in the mainland U.S., enrollment in Medicare Part B is *not* an opt-out program in which most individuals default into coverage at the time of Part A enrollment. Instead, Puerto Rican residents must actively sign up for Part B, and many do not do so. Not signing up at the time of initial eligibility subjects individuals to fines if they enroll in Part B at a later date; as a result, elderly Puerto Rican residents currently incur over \$7 million per year in late enrollment penalties.²⁰

The Affordable Care Act

Puerto Rico was largely excluded from the provisions of the ACA. While some provisions of the ACA treat Puerto Rico as a state, others treat it as a separate territory with its own authority. For instance, the Individual Mandate, the Employer Mandate, premium tax credits for purchasing private coverage in health insurance Marketplaces, and entitlement funding of the Medicaid expansion up to 133% FPL do not apply to Puerto Rico. Residents of Puerto Rico are not able to use the Federal Marketplace to purchase coverage, even without subsidies. The combination of the ACA's new insurance requirements without the availability of subsidies led to concerns that the law would destabilize insurance markets in the territories. In response, the Centers for Medicare and Medicaid Services clarified in July 2014 that territories are exempted from most of the insurance requirements outlined in the

Affordable Care Act – including guaranteed issue, prohibition on lifetime and annual limits, coverage of preventive health services, community rating, and essential health benefits.²¹ Although these provisions were designed to increase access to health insurance under the ACA, they may be economically infeasible to implement without the federal tax credits to support a broad risk pool in the insurance market, which was CMS’s rationale for exempting the territories from the requirements. Nonetheless, for the time being, Puerto Rico has decided to honor these original policy requirements to the best of its abilities, despite limited funding and the lack of premium tax credits.²²

However, there have been other notable changes in the Commonwealth as part of the ACA. First, the cap for federal Medicaid funds to the territory was dramatically increased, going from \$260 million in 2008 to roughly \$1 billion per year from 2012-2019^{15,23}; funding after 2019 has yet to be determined. In addition, the Medicaid FMAP has been raised from 50% to 55% for all the territories as of July 2011. Territories also were given the option of implementing their own Marketplaces. While Puerto Rican residents are not eligible for federal tax credits for Marketplace coverage, Puerto Rico did receive a one-time grant of \$925 million that the Commonwealth plans to use to establish a local Marketplace with partial subsidies available to households earning up to \$25,000 per year.^{10,23,24}

Previous Research and Study Objective

Despite being home to millions of mainland U.S. citizens and facing a host of distinctive policy challenges, including providing care in a lower-resource setting than any of the 50 states, Puerto Rico has not been particularly well-studied in health services

research. While some targeted studies have analyzed aspects of Puerto Rico's Reforma of 1993,²⁵⁻²⁷ the research literature has little information on the current state of access to care in Puerto Rico, and how these outcomes compare to the mainland U.S. as a whole. One recent study compared patient experiences among Medicare beneficiaries in Puerto Rico versus the mainland U.S., finding that Puerto Ricans had worse experiences getting needed care and getting care quickly but better doctor-patient communication and customer service.²⁸ However, given the near-universal coverage rates among the elderly in both settings, these results provide little insight into the experiences of the population as a whole – and particularly among uninsured working-age adults.

With ongoing questions about how Puerto Rico will be able to finance its health care system, and states exploring coverage expansions under the ACA in a variety of distinctive economic, political, and demographic contexts, understanding what is and what is not working well in Puerto Rico in terms of health care access could provide valuable insights. The objective of our empirical analysis is to use recent national survey data to provide a snapshot of insurance coverage, access to care, and several measures of health in Puerto Rico compared to the mainland U.S.

METHODS

Data Source

The primary source for the analysis was the 2011-2012 Behavioral Risk Factor and Surveillance System (BRFSS), a telephone survey conducted by the Centers for Disease Control and Prevention. The BRFSS is an annual household survey of adults 18 and over, conducted in all 50 states, the District of Columbia, and participating U.S.

territories. Starting in 2011, the survey includes both landline and cellphone-only users. The survey is available in multiple languages, and more than 98% of respondents in Puerto Rico are administered the survey in Spanish.²⁹ Domains covered by the survey include demographics, income, whether a person has any health insurance, and several measures related to health care use and health status. Overall response rates for the BRFSS in 2012 were 58% in Puerto Rico, compared to the U.S. median of 45%.³⁰

We supplemented these primary analyses with 2012 data from the Census Bureau's American Community Survey (ACS) and the Puerto Rico Community Survey, which provide more detailed information than the BRFSS on different types of insurance coverage.

Outcomes

Our coverage outcomes were the percentage of adults with any health insurance and the proportions reporting each type of health insurance (Medicaid, Medicare, private coverage, and other insurance). We examined several general measures of health care access including having a personal doctor, delaying care in the prior year due to costs, and having had a general check-up in the prior year – outcomes which were all identified by a recent Department of Health and Human Services expert panel as highly-relevant metrics for state-level access to care.³¹ We also examined access to several specific recommended preventive services: mammogram in the past two years for women ages 40-75, Pap smears in the past three years for women ages 21-65, colorectal screening (either fecal occult blood testing or colonoscopy/sigmoidoscopy) for men and women ages 50-75, and glucose screening for diabetes among adults older than 45 and among

obese adults of any age.³²⁻³⁵ We also examined several measures of health: self-reported health status on a five-point scale, body-mass index, smoking status, and reported history of depression.

Statistical Analysis

We first conducted descriptive unadjusted comparisons between Puerto Rico and the mainland U.S. for each measure. We then estimated multivariate regression models for each outcome, with the covariate of interest a binary indicator for *Puerto Rico*, and adjusted for population features that may generate significant differences in the health-related measures we are examining. These features included age (in years, plus an indicator variable for those over 65 years), sex, household income, educational attainment, urban versus rural residence, marital status, and employment. For race and ethnicity, we took two different approaches, to account for the fact that nearly the entire sample in Puerto Rico is of Latino ethnicity. Our primary model adjusted directly for Latino ethnicity separately from race. In sensitivity analyses, we only analyzed people reporting Latino ethnicity (comparing Latinos in Puerto Rico with Latinos in the mainland U.S.). Unless noted below, the results were similar across both models.

All the study outcomes were binary, and analyses used logistic regression models. Adjusted results were then converted into predicted probabilities for ease of interpretation.

Our primary analyses compared the full Puerto Rican population to the mainland U.S. population. Secondary analyses of access to care also examined the subset of adults

without health insurance. All analyses were conducted in Stata 12.0, using the BRFSS and/or ACS survey weights and accounting for the survey design.

RESULTS

Table 1 presents summary statistics for the sample. 99% of Puerto Ricans in the sample were of Latino ethnicity versus 15% of mainland U.S. residents. A higher share of Puerto Rico's population was female. Puerto Ricans were less likely to have completed high school or to be employed, and had significantly lower household incomes.

Table 2 shows the distribution of insurance coverage, from the ACS data. The uninsured rate in Puerto Rico was significantly lower than in the mainland U.S., with only 7.4% being uninsured versus 15.0% for the mainland U.S. ($p < 0.001$). After adjustment for economic and demographic factors, these differences were even larger, with a 12.0 percentage-point lower likelihood of being uninsured for adults in Puerto Rico compared to similar individuals in the mainland U.S. ($p < 0.001$). Table 2 also shows that the payer mix in Puerto Rico was much more reliant on Medicaid, with 45.9% of residents reporting Medicaid compared to just 18.0% in the mainland U.S. ($p < 0.001$). Conversely, private coverage was significantly less common in Puerto Rico compared to the mainland U.S. in unadjusted analysis (40.8% versus 64.7%, $p < 0.001$); though after adjustment, private coverage rates were actually higher in Puerto Rico than in the mainland U.S. (+4.8 percentage points, $p < 0.001$).

Table 3 describes several measures of access to care. Among the full population, access to care was significantly better in Puerto Rico for all outcomes, after economic

and demographic adjustment. There was a 12.8 percentage-point higher likelihood of having a usual source of care among adults in Puerto Rico than among those in the mainland U.S. ($p<0.001$), and a 13.1 percentage-point higher likelihood of having had a check-up in the past year ($p<0.001$). There was a 7.6 percentage-point lower likelihood of cost-related delays in care ($p<0.001$). Even among those without any coverage, uninsured adults in Puerto Rico were more likely to have a usual source of care and have had a checkup in the prior year, and less likely to have delayed medical care due to costs than uninsured adults in the mainland U.S.

Table 4 presents several recommended health screening measures. For two of these tests – mammography and blood sugar screening – both unadjusted and adjusted rates were significantly higher among Puerto Ricans by 5-16 percentage points ($p<0.01$ for both). For pap smears, rates in the mainland U.S. and Puerto Rico were similar ($p=0.72$). For colon cancer screening, adjusted rates of colonoscopy were lower in Puerto Rico compared to the mainland U.S. (-7.9%, $p<0.001$), while fecal occult blood testing rates were higher (+10.0, $p<0.001$), and overall rates of screening did not differ significantly between the two locations (-1.0%, $p=0.42$).

Table 5 shows several health-related measures from the BRFSS. More so than the other variables, the estimates here depended on the particular model. Puerto Ricans were significantly less likely to report excellent or very good health (-2.1%, $p<0.001$). Rates of depression did not differ significantly in our main models, though in estimates for Latinos only, Puerto Ricans had lower rates of depression ($p=0.001$). Puerto Ricans were less likely to be obese in all models (-3.6% after adjustment, $p<0.001$). Findings on smoking were mixed. Puerto Ricans were less likely to smoke in unadjusted models and

in the adjusted model examining Latinos only ($p=0.05$); however, in the full sample, the difference in smoking was not statistically significant after adjustment (-0.7% , $p=0.22$).

DISCUSSION

In this cross-sectional comparison of adults in Puerto Rico and the mainland U.S., we find that health insurance coverage and basic measures of access to care are significantly better in Puerto Rico than the rest of the U.S., despite the former's much lower per capita income and policy limitations on federal financial support for health care.

The bulk of these differences in coverage and access may be due to the territory's more readily available Medicaid coverage, which accounted for nearly all of the 20 percentage-point advantage in uninsured rates (after adjustment) in Puerto Rico compared to the mainland U.S. Meanwhile, after accounting for socioeconomic status and demographics, private coverage rates in Puerto Rico were quite similar to those in the mainland U.S.. This pattern of greater access to care is consistent with prior research on cross-state variation within the mainland U.S., which has shown that states with more generous Medicaid eligibility have much better access to care among low-income individuals.^{37,38} However, even when limiting the sample to uninsured adults, those living in Puerto Rico had better access to care than uninsured adults in the mainland U.S., suggesting that these differences in access were not completely mediated by Puerto Rico's higher coverage rates.

Rates of receipt of preventive services were similar or higher in Puerto Rico for 3 of the 4 conditions we measured. More specifically, adherence rates for recommended

screening for breast cancer and diabetes were significantly higher in Puerto Rico than in the mainland U.S., both before and after adjustment. Meanwhile, recommended cervical cancer screening rates were similar in the mainland U.S. and Puerto Rico – both at roughly 85%. Rates of colorectal cancer screening, however, differed significantly by modality: colonoscopy was less common in Puerto Rico, while fecal occult blood testing (FOBT) more common, with an overall similar percentage of adults receiving any screening. While FOBT remains a recommended option for colorectal screening, it is considered by many to be an inferior test due to its lower sensitivity and inability to treat any positive findings without undergoing a diagnostic colonoscopy.³⁹ Puerto Rico’s greater use of FOBT in lieu of colonoscopy may in part reflect relative resource constraints – since colonoscopy is by far the most expensive of the screening tests we evaluated. The lower rates of colonoscopy may also reflect in part cultural barriers towards the procedure,^{40,41} and research has shown that outreach efforts using community health workers or clinical navigators can greatly expand colonoscopy rates, especially among racial and ethnic minorities.^{42,43}

In terms of health measures, obesity and smoking rates were generally lower in Puerto Rico, though overall self-reported health was slightly worse. The former may relate directly to cultural differences that promote fewer risky health behaviors in Puerto Rico, which is consistent with patterns of assimilation among immigrants to the mainland U.S., where first-generation Americans typically adopt less healthy behaviors than their immigrant parents.^{41,44} Meanwhile, overall economic distress in Puerto Rico may be in part responsible for worse perceptions of physical health; other cultural differences not

captured by simple adjustment for race and ethnicity may also have contributed to these differences in self-reported health.

Overall, our analysis highlights the relatively high rates of coverage, access to care, and preventive health care in Puerto Rico, despite the territory's challenges of higher poverty rates and less federal financial support compared to mainland states. One critical reaction to this analysis might be to argue that Puerto Rico's health system – operating at a fraction of the price – surely cannot provide adequate care compared to the mainland U.S. While much more clinically-detailed information would be needed than we have in our data in order to answer this question directly, taken as a whole, our measures of access and preventive care do not indicate that coverage in Puerto Rico is an empty benefit. In fact, health care in the Commonwealth may be preferable in many cases to the care received by similarly-situated individuals living in the mainland U.S. Population-level measures of health also cast doubt on the notion that health care in the Commonwealth is demonstrably inferior, as Puerto Rico enjoys nearly a 5% lower age-adjusted mortality rate than the rest of the mainland U.S., and 26% lower mortality than Mississippi, the state with a per capita income closest to that of Puerto Rico⁴⁵ – though of course numerous factors influence life expectancy, of which health care is only one factor.

Limitations

Our study has several important limitations. First, while we used validated government surveys for our data sources, our outcomes are all self-reported, which means that issues such as recall bias and social desirability bias may have affected our

outcomes. To the extent that these biases may vary between Puerto Rico and the mainland U.S., this could have produced some of the observed differences in our analysis. Demographic factors such as age, gender, and education have been shown to affect the quality of self-reported data, though our estimates did adjust directly for these factors.⁴⁶ In addition, response rates were somewhat higher in Puerto Rico than in the mainland U.S. (58% vs. 45%), which may also have impacted our results, though the direction of potential bias on our results is unclear. However, the BRFSS's use of population-representative weighting to account for non-response has been shown to mitigate potential bias.⁴⁷

While we measured several preventive services recommended by national guidelines, our data sources do not allow us to comment on the quality of the health care services rendered nor patients' experiences with their health care, both of which are important questions for future research. Findings from the Consumer Assessment of Healthcare Providers and Systems suggest that there are important differences in these areas among Medicare beneficiaries in Puerto Rico versus the mainland U.S., but it is unclear how these patterns may differ for younger adults not in Medicare.²⁸

Finally, our analyses are cross-sectional and observational. While the patterns in the data we presented are suggestive regarding relative strengths and limitations in the Puerto Rican health care system, we are unable to attribute any of these outcomes directly to policy decisions made by the territory or by federal policymakers. Numerous unmeasured factors including cultural norms, economic conditions, available resources, and environmental influences may all have contributed to some of the observed differences between coverage, access, and health measured in our sample. Furthermore,

given that the BRFSS did not collect data in Puerto Rico until the late 1990s, we are unable to comment directly on the extent to which the Commonwealth's reform efforts beginning in 1993 produced any changes in the access outcomes studied here. Our analysis is best thought of as descriptive and exploratory, providing a broad overview of how the Puerto Rican health system and mainland U.S. health system compare on several measures, rather than a policy evaluation of Puerto Rico's reform efforts or Congressional policy towards the territory, which is beyond the scope of our paper and our data sources.

Policy Implications and Conclusions

Despite the fact that Puerto Rico's Medicaid program has a federal match rate far lower than that of other relatively poor states, is subject to a statutory cap, and is excluded from Medicaid DSH payments, Puerto Rico currently enjoys significantly greater levels of coverage and access to care than the mainland U.S. as a whole. The pattern of markedly higher Medicaid coverage rates in the Commonwealth, associated with much better access to care in a low-income population, suggests that Medicaid eligibility may play a key role in expanding access to care and to recommended preventive services in resource-poor settings. This pattern of findings is consistent with recent studies in Oregon, Massachusetts, and several other states showing significant gains in access to care and recommended preventive services related to the expansion of Medicaid or subsidized state coverage.⁴⁸⁻⁵¹

It is notable that as of July 2014 nearly half the states continue to reject expanding Medicaid under the ACA, in large part due to concerns about state budget impacts,⁵²

while Puerto Rico – with a poverty rate twice as high and federal support for Medicaid far less than what states are eligible for under the ACA – has already made the commitment to cover the bulk of its low-income uninsured population. If Puerto Rico can achieve coverage rates of over 90% with far fewer resources, it becomes challenging to see states’ resistance to the ACA expansion as one resulting from economic necessity rather than political and ideological opposition to the law.

Our findings also have important policy implications for Puerto Rico itself. For the measures related to primary care access that we evaluated, Puerto Rico’s health system performs very well. However, disparities in access for colonoscopy suggest that specialist-delivered services may be an area of greater concern. Specialist shortages may be related to both internal and external factors, such as increasing demand in the mainland U.S. for bilingual physicians and significantly lower physician salaries in Puerto Rico compared to the mainland U.S., both of which have been linked to increasing migration of physicians away from the Commonwealth.⁵³

While the territory enjoys relatively high levels of coverage and access to care compared to the mainland U.S., its current budget pressures threaten to erode these accomplishments. Current Medicaid funding for Puerto Rico and the other territories remains far below the level received by the states. While the ACA significantly increased Puerto Rico’s federal support for Medicaid by lifting its statutory cap nearly three-fold, the current match rate of 55% is still markedly lower than that received by other low-income parts of the mainland U.S.; by contrast, Mississippi – with a poverty rate half as high as Puerto Rico – currently receives a 74% federal match rate. Furthermore, Puerto Rico is ineligible for the ACA’s 100% match rate to cover

childless adults up to 138% of the FPL. Finally, the ACA's increase in the Medicaid cap was only guaranteed through 2019, and without an extension, the expiration of this funding would leave Puerto Rico at risk for returning to its pre-ACA days of less than 20% effective federal support for Medicaid.

Thus, federal policies prioritize spending health care funds on citizens living in the mainland U.S. over U.S. citizens in Puerto Rico. Territorial status currently plays the determining role in Congress's differential treatment of these two groups of citizens. In part, this may be justified by the differential tax obligations of residents of Puerto Rico versus those in the mainland U.S. Most residents of Puerto Rico (except those employed by the U.S. government) are not subject to the federal income tax, though Puerto Rican residents pay several other forms of federal tax including commodity taxes, Social Security and Medicare payroll taxes, and import/export taxes. Exploring a different political status (such as statehood or a modification of current territorial status) could significantly impact federal funding for health care in Puerto Rico, but this approach is far from straightforward. Puerto Rico has had a long internal struggle over its political status, and statehood – even if desired by some of the population of the Commonwealth – would require a vote of admission to the Union by the U.S. Congress. Thus, for the time being, the territory's political status is likely to lead to continuing funding differences for health care (and other public services) compared to the mainland U.S.

In conclusion, despite having a population that is far poorer, Puerto Rico outperforms the mainland U.S. on several measures of coverage and access. However, national policies capping federal support to the territory have contributed to major budgetary challenges. While the Affordable Care Act significantly increases federal

resources in Puerto Rico for the next several years, the territory's health policy efforts are subject to continuing restrictions on Medicaid funding and premium tax credits compared to the rest of the mainland U.S. Future research monitoring these issues will be valuable to informing ongoing federal policy towards the Commonwealth, and continuing analyses of Puerto Rico's distinctive health care system can shed light on the intersection of federal policies and health care for low-income populations.

REFERENCES

1. U.S. Census Bureau. Annual Estimates of the Resident Population by Single Year of Age and Sex for the United States, States, and Puerto Rico Commonwealth. 2014.
2. Motel S, Patten E. Hispanics of Puerto Rican Origin in the United States, 2010-2012.
3. U.S. Census Bureau. Selected characteristics of people's nativity and citizenship in the past 12 months: American Community Survey 5-Year Estimates. 2008-2012.
4. U.S. Census Bureau. Characteristics of people at specified levels of poverty in the past 12 months: American Community Survey 5-Year Estimates. 2008-2012.
5. Noss A. Household Income for States: 2010 and 2011: U.S. Census Bureau; 2012.
6. Santos-Lozada AR. Transformations of public healthcare services in Puerto Rico from 1993 until 2010 Population Association of American 2013 Annual Meeting Program 2013.
7. Health Systems Profile: Puerto Rico. Washington, DC: Pan American Health Organization; 2007.
8. Organizacion Panamericana de la Salud P. Perfil De Los Sistemas De Salud. Washington DC 2007.
9. Hayashi A, Finnegan B, Shin P, Jones E, Rosenbaum S. Examining the Experiences of Puerto Rico's Community Health Centers Under the Government Health Insurance Plan. The George Washington University School of Public Health and Health Services: Geiger Gibson/RCHN Community Health Foundation Research Collaborative 2009.
10. Maldonado L. Health Reform Impact For Puerto Rico: Milliman Healthcare Reform Briefing Paper; 2010.
11. Spending and Enrollment Detail for CBO's August 2010 Baseline: Children's Health Insurance Program (CHIP). Washington, D.C.: Congressional Budget Office; 2010.
12. The World Bank. Health expenditure per capita (current US\$) 2012.
13. Puerto Rico Chamber of Commerce. Some Facts For Reference: Puerto Rico Health & Insurance Conference; 2014.
14. Kaiser. Medicaid Moving Forward. Washington, DC: Kaiser Family Foundation; 2014.
15. Medicaid and CHIP: Opportunities Exist to Improve U.S. Insular Area Demographic Data That Could Be Used to Help Determine Federal Funding. Washington, DC: U.S. Government Accountability Office; 2009.
16. Hearing on The Future of Medicaid: Strategies for Strengthening American's Vital Safety Net. US Senate Finance Committee. Commonwealth of Puerto Rico: Governor Anibal Acevedo-Vilá; 2005.
17. Medicaid in the Territories – Current Law and Changes Proposed in Health Reform: U.S. Department of Health and Human Services: Office of Intergovernmental Affairs; 2010.
18. Kaiser. Medicare Advantage (MA) Plan Penetration. Washington, DC: Kaiser Family Foundation; 2012.
19. Medicare payments to PR hospitals to surge. Caribbean Business 2013.

20. Pierluisi Continues His Efforts to Improve Access to Medicare Part B in Puerto Rico. 2012. (Accessed 5 July 2014, at <http://pierluisi.house.gov/media-center/press-releases/pierluisi-continues-his-efforts-to-improve-access-to-medicare-part-b-in>)
21. Tavenner M. Letter to Commissioner Gregory R. Francis. Washington, DC: Centers for Medicare and Medicaid Services; 2014.
22. Personal Communication: Jorge Mas, Director of Administración de Seguros de Salud, July 2014.
23. Diaz-Gines FR. A New Economy in Health Care. Puerto Rico Health & Insurance Conference 2011 2011.
24. Crescioni XN. Obamacare health plan and its impact on Puerto Rico's health services. Caribbean Business. Puerto Rico; 2014.
25. Baez-Feliciano DV, Thomas JC, Gomez MA, et al. Changes in the AIDS epidemiologic situation in Puerto Rico following health care reform and the introduction of HAART. *Revista panamericana de salud publica = Pan American journal of public health* 2005;17:92-101.
26. Chirikos TN, Lopez-Garcia J, Cintron Vargas C, Gonzalez OL, Perez-Grau MP, Baez-Diaz L. Evaluation of breast cancer care under Puerto Rico's Health Care Reform. *Journal of health care for the poor and underserved* 2007;18:116-38.
27. Alegria M, McGuire T, Vera M, Canino G, Matias L, Calderon J. Changes in access to mental health care among the poor and nonpoor: results from the health care reform in Puerto Rico. *American journal of public health* 2001;91:1431-4.
28. Elliott MN HA, Dembosky JW, Hambarsoomian K, Weech-Maldonado R. Are there differences in the Medicare experiences of beneficiaries in Puerto Rico compared with those in the U.S. mainland? . *Med Care* 2012;50:243-8.
29. About the Behavioral Risk Factor Surveillance System (BRFSS) 2012. Behavioral Risk Factor Surveillance System: Center for Disease Control and Prevention; 2013.
30. Behavioral Risk Factor Surveillance System 2012 Summary Data Quality Report. Atlanta, GA: Centers for Disease Control and Prevention; 2013.
31. Davern M. Recommendations for Monitoring Access to Care among Medicaid Beneficiaries at the State-level Office of the Assistance of Planning and Evaluation US Department of Health and Human Services 2013.
32. U.S. Preventive Services Task Force. Screening for Type 2 Diabetes Mellitus in Adults: Clinical Summary of U.S. Preventive Services Task Force Recommendation 2008.
33. U.S. Preventive Services Task Force. Screening for Colorectal Cancer: U.S. Preventive Services Task Force Recommendation Statement; 2008.
34. U.S. Preventive Services Task Force. Screening for Cervical Cancer: U.S. Preventive Services Task Force Recommendation Statement; 2012.
35. U.S. Preventive Services Task Force. Screening for Breast Cancer; 2013.
36. Cutler D, Gruber J. Does Public Insurance Crowd Out Private Insurance? . *The quarterly journal of economics* 1996:391-460.
37. Clark CR, Ommerborn MJ, Coull BA, Pham DQ, Haas J. State Medicaid eligibility and care delayed because of cost. *The New England journal of medicine* 2013;368:1263-5.

38. Weissman JS, Zaslavsky AM, Wolf RE, Ayanian JZ. State Medicaid coverage and access to care for low-income adults. *J Health Care Poor Underserved* 2008;19:307-19.
39. Niv Y, Sperber AD. Sensitivity, specificity, and predictive value of fecal occult blood testing (Hemoccult II) for colorectal neoplasia in symptomatic patients: a prospective study with total colonoscopy. *The American journal of gastroenterology* 1995;90:1974-7.
40. Dayna S E, MD, Gray, D. Patient Attitudes and Issues in Colon Cancer Screening. *Journal of general internal medicine* 2009;24:963-70.
41. Afaible-Munsuz A, Liang, S. Y., Ponce, N. A., & Walsh, J. M. Acculturation and colorectal cancer screening among older Latino adults: differential associations by national origin. *Journal of general internal medicine* 2009;24:963-70.
42. Percac-Lima S, Grant, R. W., Green, A. R., Ashburner, J. M., Gamba, G., Oo, S. A culturally tailored navigator program for colorectal cancer screening in a community health center: a randomized, controlled trial. *Journal of general internal medicine* 2009;24:211-7.
43. Christie J IS, Lihau-Nkanza I. A randomized controlled trial using patient navigation to increase colonoscopy screening among low-income minorities. *J Natl Med Assoc* 2008;100:278-84.
44. McCarthy WJ, Flores Y, Zheng H, Hanson TL. Immigrant generational status and ethnic differences in health. *American journal of public health* 2005;95:1494; author reply -5.
45. Murphy SL XJ, Kochanek, KD. Deaths: Final Data for 2010: U.S. Department of Health and Human Services; 2013.
46. Short ME, Goetzel, R. Z., Pei, X., Tabrizi, M. J., Ozminkowski, R. J., Gibson, T. B. How accurate are self-reports? Analysis of self-reported health care utilization and absence when compared with administrative data. *Journal of occupational and environmental medicine* 2009;51:786-96.
47. Assessing the Representativeness of Public Opinion Surveys. Pew Research Center, 2012. at [http://www.people-press.org/files/legacy-pdf/Assessing the Representativeness of Public Opinion Surveys.pdf](http://www.people-press.org/files/legacy-pdf/Assessing%20the%20Representativeness%20of%20Public%20Opinion%20Surveys.pdf).)
48. Sommers BD, Baicker K, Epstein AM. Mortality and access to care among adults after state Medicaid expansions. *The New England journal of medicine* 2012;367:1025-34.
49. Sommers BD, Long SK, Baicker K. Changes in mortality after Massachusetts health care reform: a quasi-experimental study. *Annals of internal medicine* 2014;160:585-93.
50. Baicker K, Taubman SL, Allen HL, et al. The Oregon experiment--effects of Medicaid on clinical outcomes. *The New England journal of medicine* 2013;368:1713-22.
51. Van Der Wees P, Zaslavsky, A. M., & Ayanian, J. Z. Improvements in health status after massachusetts health care reform. *The Milbank quarterly* 2013;91:663-89.
52. Sommers BD, Epstein AM. U.S. governors and the Medicaid expansion--no quick resolution in sight. *The New England journal of medicine* 2013;368:496-9.
53. Coto D. Doctors Flee Puerto Rico For US Mainland. AP: The Big Story 2013.

54. Koebler J. Despite Referendum, Puerto Rico Statehood Unlikely Until At Least 2015. US News and World Report 2012.

Table 1: Descriptive Statistics for the Study Sample (n = 980,095)

Variable	Puerto Rico (%, or mean)	United States (%, or mean)	p-value
Male	46.9%	48.7%	0.001
Age, yrs	45.6	46.4	<0.001
Elderly (>65 yrs), %	17.8%	17.9%	0.70
Race			
-White	54.1%	74.6%	<0.001
-Black	6.4%	12.1%	<0.001
-Asian	0.1%	4.7%	<0.001
-Native American	0.2%	1.7%	<0.001
-Other	39.3%	6.9%	<0.001
Latino Ethnicity	98.9%	14.6%	<0.001
Education			
-Less than high school	30.0%	15.0%	<0.001
-High school diploma	25.8%	28.9%	<0.001
-Some college	44.0%	55.7%	<0.001
Rural	0%	13.8%	<0.001
Married	39.7%	50.0%	<0.001
Working	40.1%	55.2%	<0.001
Household Income, Annual			
-Less than \$15,000	40.4%	11.4%	<0.001
-\$15,000 to \$24,999	23.5%	15.9%	<0.001
-\$25,000 to \$34,999	7.6%	9.7%	<0.001
-\$35,000 to \$49,999	5.7%	12.1%	<0.001
-\$50,000 or More	5.3%	37.2%	<0.001
-Don't Know or Refused	17.5%	13.6%	<0.001

Notes:

Estimates are for all adults ages 18 and older in the 2011-2012 Behavioral Risk Factor Surveillance System.

P-values represent between-group differences (unadjusted) for Puerto Rico versus the United States.

Table 2: Insurance Coverage for Adults in Puerto Rico versus the United States

Outcome	Unadjusted			Adjusted			
	Puerto Rico (%)	United States (%)	p-value	Odds Ratio	95% Confidence Interval	p-value	Predicted difference, PR-US (percentage points)
Uninsured	7.4%	15.0%	<0.001	0.15	(0.15, 0.16)	<0.001	-12.0%
Medicaid	45.9%	18.0%	<0.001	2.31	(2.23, 2.38)	<0.001	+9.9%
Medicare	19.5%	15.7%	<0.001	1.93	(1.78, 2.09)	<0.001	+1.9%
Private Health Insurance	40.8%	64.7%	<0.001	1.39	(1.35, 1.44)	<0.001	+4.8%
VA/Military Healthcare	1.5%	2.2%	<0.001	1.12	(1.01, 1.24)	0.03	+0.2%

Notes:

PR = Puerto Rico. US = United States.

Estimates are for all adults ages 18 and older in the 2012 American Community Survey (n=2,441,532) and Puerto Rico Community Survey (n=26,371). Adjusted estimates are from a multivariate regression model controlling for age (in years, plus an indicator variable for those over 65 years), sex, household income (as a percentage of FPL in four categories - <50%, 50-100%, 100-200%, >200%), educational attainment, urban versus rural residence, marital status, and employment.

Table 3: Access to Care for Adults in Puerto Rico versus the United States

Outcome	Unadjusted			Adjusted			
	Puerto Rico (%)	United States (%)	p-value	Odds Ratio	95% Confidence Interval	p-value	Predicted difference, PR-US (percentage points)
<i>ALL ADULTS</i>							
Any Health Insurance	91.0%	81.2%	<0.001	8.28	(7.55, 9.07)	<0.001	+15.5%
Check-up in Past Year	76.7%	67.3%	<0.001	2.09	(1.96, 2.22)	<0.001	+13.1%
Usual Source of Care	82.7%	77.9%	<0.001	3.20	(2.98, 3.44)	<0.001	+12.8%
No Delays in Care Due to Cost	82.9%	83.3%	0.45	2.13	(1.98, 2.28)	<0.001	+7.6%
<i>UNINSURED ADULTS</i>							
Check-up in Past Year	48.7%	39.6%	<0.001	1.46	(1.23, 1.74)	<0.001	+8.9%
Usual Source of Care	35.9%	41.6%	0.003	1.41	(1.17, 1.69)	<0.001	+7.7%
No Delays in Care Due to Cost	62.0%	53.9%	<0.001	1.40	(1.18, 1.67)	<0.001	+7.8%

Notes:

PR = Puerto Rico. US = United States.

Estimates are for adults ages 18 and older in the 2011-2012 Behavioral Risk Factor Surveillance System.

Sample excludes item non-response for each particular outcome.

Adjusted estimates are from a multivariate regression model controlling for age (in years, plus an indicator variable for those over 65 years), sex, household income, educational attainment, urban versus rural residence, marital status, and employment.

Table 4: Preventive Health Services for Adults in Puerto Rico versus the United States

Outcome	Unadjusted			Adjusted			
	Puerto Rico (%)	United States (%)	p-value	Odds Ratio	95% Confidence Interval	p-value	Predicted difference, PR-US (percentage points)
Colonoscopy (Adults 50-75)	44.2%	65.8%	<0.001	0.68	(0.60, 0.77)	<0.001	-7.9%
Fecal Occult Blood Testing (Adults 50-75)	33.4%	33.9%	0.65	1.58	(1.37, 1.81)	<0.001	+10.0%
Ever Any Colon Cancer Screening (Adults 50-75)	59.4%	72.5%	<0.001	0.95	(0.83, 1.08)	0.42	-1.0%
Mammogram in past 2 years (Women 40-75)	84.6%	81.4%	0.001	1.58	(1.31, 1.91)	<0.001	+5.8%
Pap smear in past 3 years (Women 21-65)	85.5%	85.4%	0.90	0.97	(0.80, 1.17)	0.72	-0.4%
Blood sugar in past 3 years (At-Risk Patients*)	77.4%	63.8%	<0.001	2.22	(1.94, 2.53)	<0.001	+15.5%

Notes:

PR = Puerto Rico. US = United States.

Estimates are for adults in the 2011-2012 Behavioral Risk Factor Surveillance System. Sample excludes item non-response for each particular outcome.

Adjusted estimates are from a multivariate regression model controlling for age (in years, plus an indicator variable for those over 65 years), sex, household income (as a percentage of FPL, plus an indicator for those households not reporting any income information), educational attainment, urban versus rural residence, marital status, and employment.

* Defined based on U.S. Preventive Services Task Force criteria of obesity (body-mass index ≥ 30 , or age ≥ 45).

Table 5: Selected Health Measures for Adults in Puerto Rico versus the United States

Outcome	Unadjusted			Adjusted			
	Puerto Rico (%)	United States (%)	p-value	Odds Ratio	95% Confidence Interval	p-value	Predicted difference, PR-US (percentage points)
Excellent or Very Good Health	30.1%	50.9%	<0.001	0.91	(0.86, 0.96)	0.002	-2.1%
Obesity	27.3%	27.6%	0.67	0.82	(0.78, 0.88)	<0.001	-3.6%
Current Smoker	13.7%	19.5%	<0.001	0.95	(0.87, 1.03)	0.22	-0.7%
Reports History of Depression	16.6%	16.9%	0.46	0.98	(0.91, 1.05)	0.59	-0.3%

Notes:

PR = Puerto Rico. US = United States.

Estimates are for all adults ages 18 and older in the 2011-2012 Behavioral Risk Factor Surveillance System. Sample excludes item non-response for each particular outcome.

Adjusted estimates are from a multivariate regression model controlling for age (in years, plus an indicator variable for those over 65 years), sex, household income (as a percentage of FPL, plus an indicator for those households not reporting any income information), educational attainment, urban versus rural residence, marital status, and employment.