PUERTO RICO
INSTITUTE OF STATISTICS

REPORT
to the
BOARD OF GOVERNMENT
of the
PUERTO RICO PHYSICIANS
AND SURGEONS GUILD

Regarding the possible existence of a Public Housing Prevalence Bias in the Estimation of the Office Rent component of the Geographic Practice Cost Index (GPCI) used by the Centers for Medicare and Medicaid Services (CMS) to provide differential compensation to physicians in different parts of the United States and Puerto Rico for providing services under Medicare Part B.

July 17, 2015

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Executive Summary

The Puerto Rico Physicians and Surgeons Guild (*Colegio de Médicos Cirujanos de Puerto Rico*) requested the technical assistance of the Puerto Rico Institute of Statistics (PRIS) to understand a potential bias in the calculation of the Office Rent component of the Geographic Practice Cost Indexes (GPCIs) prepared by the Centers for Medicare and Medicaid Services (CMS). The GPCIs are used to adjust the compensation that physicians receive for providing services under Medicare Part B (see Physician Fee Schedule (PFS)) that may arise as a result of potential differences in the costs of providing Medicare services across different regions of the United States and Puerto Rico.

The purpose of this report is to present PRIS findings regarding CMS's use of data from the American Community Survey (ACS) and the Puerto Rico Community Survey (PRCS) of the U.S. Census Bureau to estimate the median gross rent of a 2-bedroom housing unit in different regions of the United States and Puerto Rico, which serves as a proxy for the calculation of the Office Rent component of the GPCIs. In specific, we control for the prevalence of non-market housing (i.e. public housing) in each PFS payment locality to test for the existence of a bias. We find that:

1) After controlling for non-market housing, the median gross rent of a 2-bedroom housing unit changes in a statistically significant way in all PFS payment localities. This provides evidence to support the existence of a bias related to the differential prevalence of non-market housing in different parts of the United States and Puerto Rico.
2) Amongst all PFS payment localities, Puerto Rico obtains the lowest estimate for the median gross rent of a 2-bedroom housing unit ($360). Once HUD public housing rent thresholds are applied, Puerto Rico continues to receive the lowest estimate for the median gross-rent of a 2-bedroom housing unit ($510). But, in the case of Puerto Rico, this represents a statistically significant increase of 42 percent, by far the largest percentage increase amongst all PFS payment localities.
3) The use of uncontrolled residential rent estimates to proxy for commercial rents introduces a bias associated with factors unrelated to commercial rent markets, such as the prevalence of public housing, amongst others. Doctors in Puerto Rico have been affected more by this statistical bias than doctors in any part of the United States. We estimate that this statistical bias artificially reduces Puerto Rico's GPCI by about 4 percent. According to a panel of experts, the total economic impact of this bias could reach $120 million annually. We term this bias the "Public Housing Prevalence Bias."
4) The Department of Housing and Urban Development (HUD) has been using for many years the ACS/PRCS to estimate adequately controlled residential rent estimates, known as Fair Market Rents (FMR). In fact, prior to calendar year 2012, CMS used FMR estimates as the proxy for the Office rent component of the GPCI. But, when CMS switched to using its own uncontrolled residential rent estimates prepared from the ACS/PRCS, Puerto Rico's Practice Expense GPCI fell by 20 percent, the largest drop of any of the 89 PFS payment localities.
5) There is evidence that suggests that the costs of renting a high-quality residential housing unit in the San Juan, Puerto Rico Metropolitan Statistical Area, including energy costs, is much higher than properly controlled ACS/PRCS gross rent estimates would suggest. In specific, the Cost of Living Index of the Council for Community and Economic Research based in Arlington, Virginia suggests that the rent plus energy costs in Puerto Rico could be as high as in Beaumont, TX MSA and Chicago, IL MSA.

We recommend several ways that CMS could proceed to correct for the Public Housing Prevalence Bias in the Office Rent component of the Puerto Rico Geographic Practice Cost Index. The remediation of this situation should not have to wait any more time.

I. Introduction

Title XVIII of the Social Security Act establishes regulations for Medicare, a health insurance program of the United States Government for people age 65 or older,[1] administered by the Centers for Medicare and Medicaid Services (CMS). Participants automatically pay into the system via payroll taxes on a regular basis throughout most of their working lives. The program currently covers people in the United States, Puerto Rico, the U.S. Virgin Islands, and Guam. In almost all cases, participants pay the same percent no matter where they live or where they obtain their medical services.

The Social Security Act also requires that CMS develop and update at least every three years the Physician Fee Schedule (PFS), which is used to determine physician compensation for providing services under Medicare Part B. The PFS is composed of three components (Work, Practice Expense, and Malpractice Premium) for 89 payment localities.[2]

The Practice Expense component is sub-divided into several components, including the topic of this study, the Office Rent component. This component attempts to capture the cost associated with the commercial rent necessary for a space of sufficient size and quality to adequately operate a basic doctor's office.

Section 1848(e)(1)(A) of the Social Security Act requires CMS to develop measures of the relative cost differences among the payment localities compared to the national average for each of the components of the PFS. To do so, CMS prepares Geographic Practice Cost Indexes (GPCIs) to adjust for cost differences associated with each of the components of the costs, amongst the 89 different Medicare payment localities.

However, currently, there is no publically available data on commercial office rental rates with sufficient geographic detail and reliability that can serve to adjust for cost differences associated with the Office Rent component.[3] Due to this lack of suitable commercial office rent data, CMS has relied on residential rental rates as a proxy for many years.

In particular, for several years, CMS used residential rent statistics prepared by Housing and Urban Development (HUD) using multiple sources of information including the American and Puerto Rico

[1] It also offers coverage to other people with certain disabilities or medical conditions.
[2] The current Physician Fee Schedule (PFS) locality structure was developed and implemented 18 years ago in 1997. It has 89 total PFS localities; 34 localities are statewide areas (that is, only one locality for the entire state). There are 52 localities in the other 16 states, with 10 states having 2 localities, 2 states having 3 localities, 1 state having 4 localities, and 3 states having 5 or more localities. The District of Columbia, Maryland, and Virginia suburbs, Puerto Rico, and the Virgin Islands are additional localities that make up the remainder of the total of 89 localities.
[3] Over the years, CMS has tested several alternatives without success.

Community Surveys (ACS/PRCS) from the U.S. Census Bureau.[4] However, starting in the calendar year 2012, CMS tested and approved the use of its own rent statistics it had prepared using ACS/PRCS data directly.

CMS has the responsibility of making sure that the GPCIs it proposes adequately reflect actual cost differences in the provision of Medicare services, not other unrelated factors. To do so requires controlling for any potential unrelated factors that may generate biases in the calculation of the GPCIs that have economically meaningful implications.

In this brief research note, we examine whether the prevalence of non-market housing (i.e. public housing) has influenced CMS estimates for the Office Rent component of the GPCIs, assigned to each of the 89 PFS payment localities. In specific, we answer the following questions:

- Have differences in the prevalence of non-market housing generated a bias in the residential rent statistics prepared by CMS to estimate the Office Rent component of the GPCIs?
- If so, what has been its impact?
- Are there alternative methods that CMS could employ to correct for this bias?

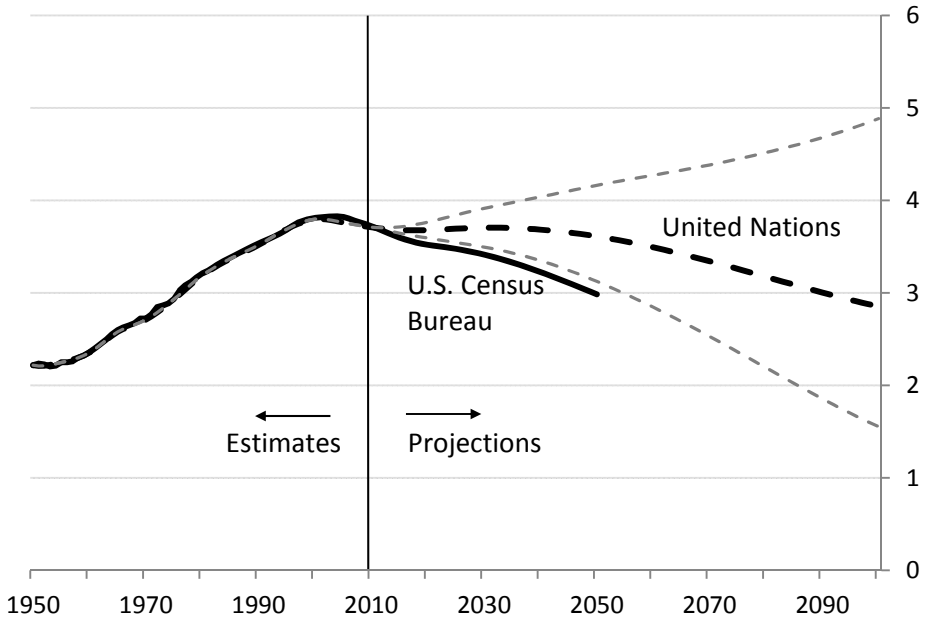
[4] See Fair Market Rent (FMR) program of HUD: http://www.huduser.org/portal/datasets/fmr.html.

II. Background

Demographic developments and outlook

Over the past ten years, Puerto Rico has experienced a loss of about 7.3 percent of its population, which is equivalent to about 278 thousand people.[5] This is the first population reduction in the recorded history of Puerto Rico.[6] The reduction owes largely to a secular downward trend in the number of births, as well as to a relatively high level of net outward migration. According to official population projections, this trend is expected to continue for the rest of this century. See Figure 1.

Figure 1. Population of Puerto Rico
(millions of persons)

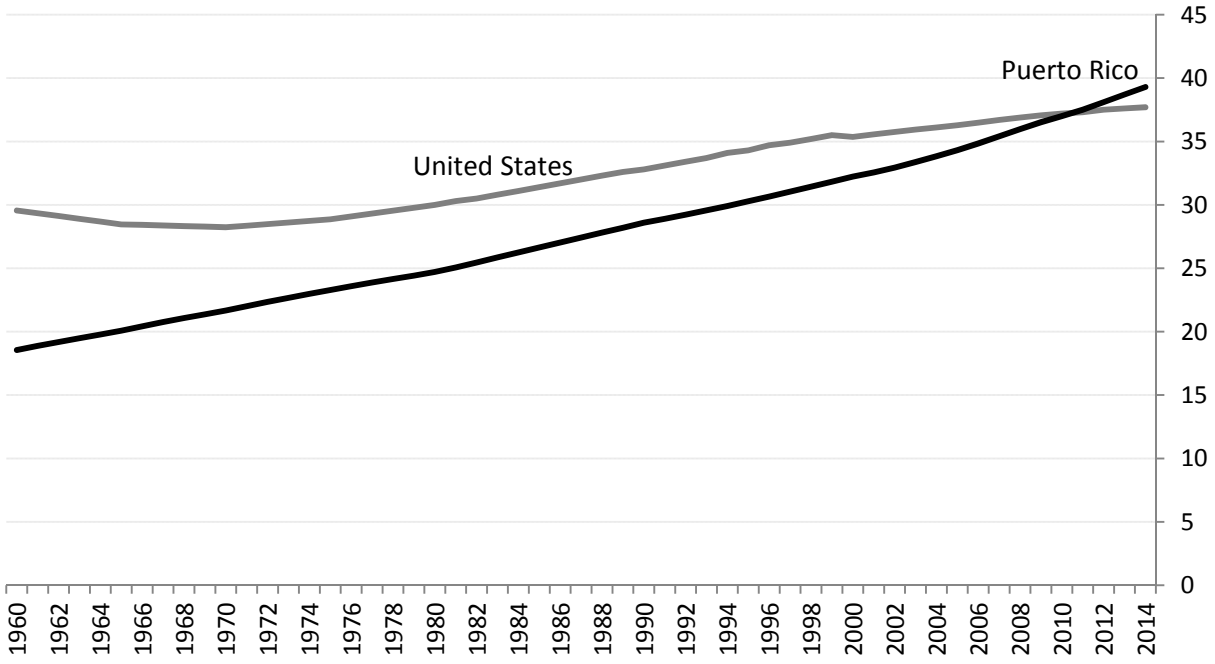


Source: Estimados anuales de la población 1950-2000, Junta de Planificación de Puerto Rico; Annual Population Estimates 2000-2010, U.S. Census Bureau; International Database, U.S. Census Bureau; World Population Prospects: The 2012 Revision, Population Division of the United Nations Department of Economic and Social Affairs.

Recent outward migrants have been relatively young, a factor which has accelerated the aging of Puerto Rico's overall population. In 2011, the median age in Puerto Rico surpassed the median age of the United States for the first time in recorded history. See Figure 2.

[5] Source: U.S. Census Bureau, Annual Population Estimates 2004-2014 (2014 vintage and 2000-10 intercensal estimates).
[6] In the 16th Century, it is believed that the Taíno inhabitants of Puerto Rico became extinct as a culture following settlement by Spanish colonists, primarily due to infectious diseases to which they had no immunity. It is unclear whether the population of Puerto Rico as a whole declined during this period.

Figure 2. Median Age of the Population
(in years)



Source: Estimados anuales de la población 1950-2000, Junta de Planificación de Puerto Rico; Annual Population Estimates 2000-2010, U.S. Census Bureau.

Puerto Rico's housing markets

According to the 3-year estimates of the 2013 Puerto Rico Community Survey of the U.S. Census Bureau, there are 1.6 million housing units in Puerto Rico, of which 1.3 million are occupied. Of these, approximately 385 thousand are occupied by a renter. In turn, of these, 115 thousand have 2 bedrooms.

Unfortunately, neither the American Community Survey nor the Puerto Rico Community Survey ask whether the housing unit is located in a public housing development project. Therefore, we cannot use the results of the Puerto Rico Community Survey alone to gauge the extent to which public housing exists in Puerto Rico.

Nevertheless, the Department of Housing and Urban Development (HUD) publishes detailed statistics on the characteristics of residents of public housing development projects across the United States and Puerto Rico. In specific, according to HUD's Residential Characteristics Report,[7] there were at least 18 thousand 2-bedroom renter-occupied public housing units in Puerto Rico as of May 2015.

[7] See http://portal.hud.gov/hudportal/HUD?src=/program_offices/public_indian_housing/systems/pic/50058/rcr.

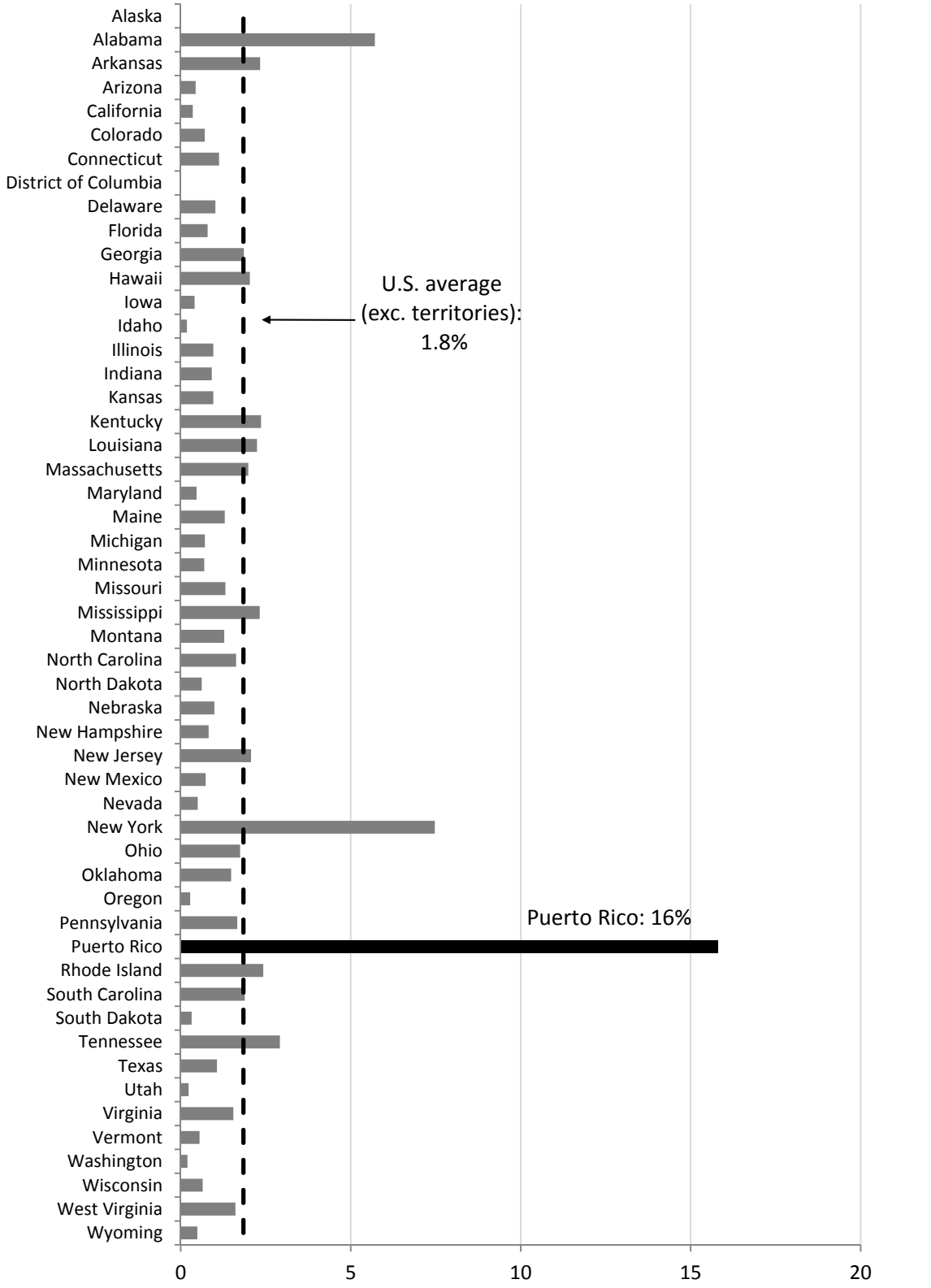
This represents about 16 percent of all 2-bedroom renter-occupied housing units, almost 9 times the national average. See Figure 3.

On the other hand, Figure 4 presents the median gross rent by state and Puerto Rico according to the 3-year estimates of the 2013 American and Puerto Rico Community Surveys of the U.S. Census Bureau. Nationwide, the median gross rent paid is estimated to be about $900 per month. This is about twice the median gross rent paid in Puerto Rico of $452 per month.

In this research note, we examine whether these two observations are related. In specific, we examine whether the greater provision of public housing in Puerto Rico is in part responsible for the very low median gross rent estimates that can be obtained for Puerto Rico from the uncontrolled residential rent estimates that can be gleaned from the standard tables of the Puerto Rico Community Survey of the U.S. Census Bureau.

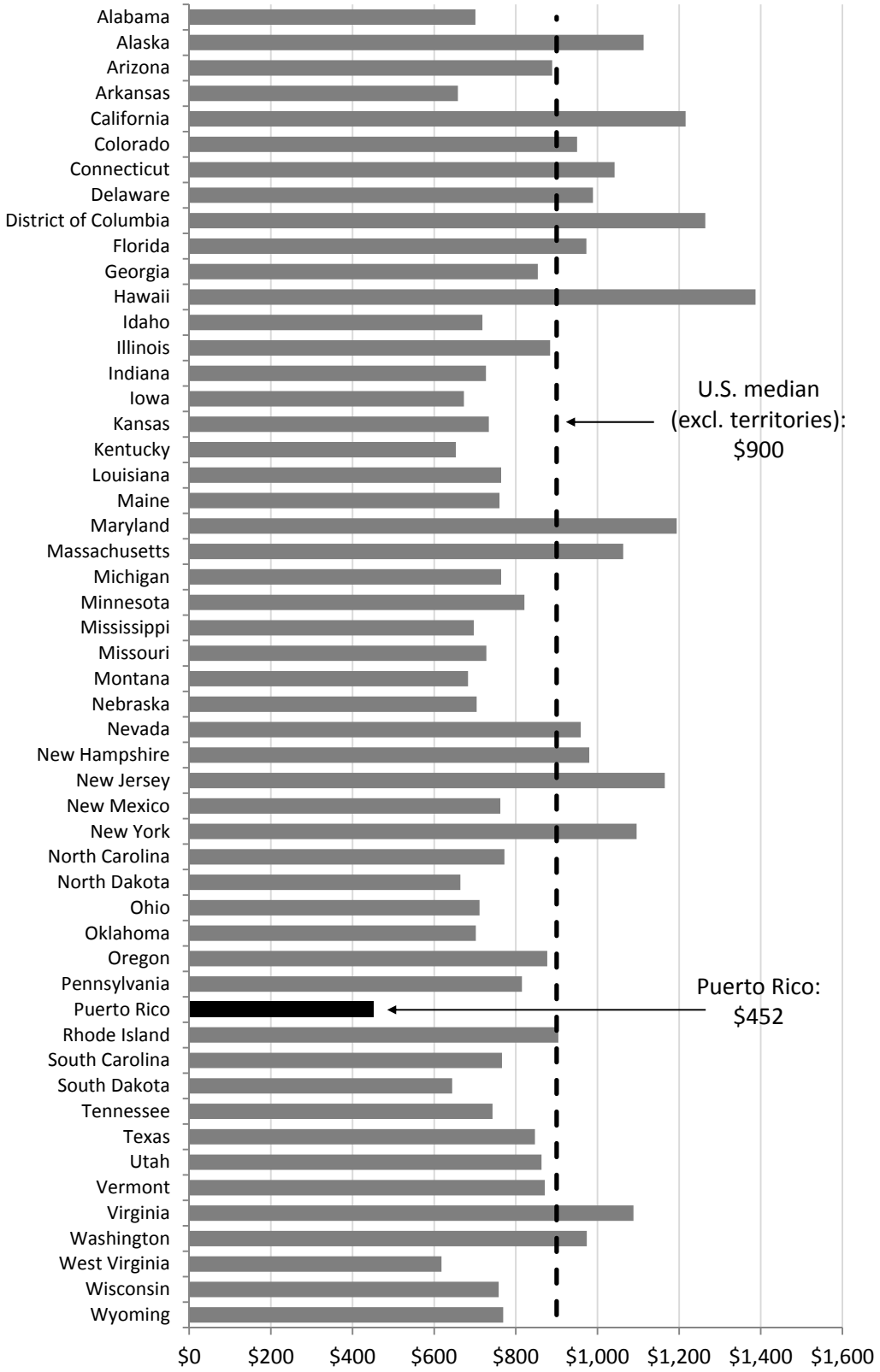
Why might these two variables be related? Public housing rents are relatively very low, and are therefore typically located in the lower part of the rent distribution. Therefore, all else equal, an increase in the number of public housing units in the distribution will typically tend to lower measures of central tendency, such as the median.

Figure 3. Percent of 2-Bedroom Renter-Occupied Housing Units that are in Public Housing



Source: Report Characteristics Report, HUD as of May 31, 2015; American and Puerto Rico Community Survey, U.S. Census Bureau, 2013 3-year estimates.

Figure 4. Median Gross Rent of Renter-Occupied Housing Units



Source: American and Puerto Rico Community Survey, U.S. Census Bureau, 2013 3-year estimates.

III. Methodology

We use data from the American and Puerto Rico Community Surveys 2008-10 Public Use Microdata Sample (PUMS) to estimate the Median Gross Rent[8] of a 2-Bedroom Renter-Occupied Housing Unit in each of the 89 PFS payment localities.[9,10] Currently, CMS uses the results of this survey during the 3-year period, comprising calendar year 2008 through calendar year 2010, to estimate the GPCIs.

The medians are calculated using the appropriate replicate weights provided by the U.S. Census Bureau. Public Use Microdata Areas (PUMAs) from the 2000 Census were classified according to the PFS payment localities used by CMS. See Table 2 in the Appendix for a table showing the relation between the 2000 PUMAs and the PFS payment localities.

In order to control for differences in the prevalence of public housing, we estimate the Median Gross Rents for a 2-Bedroom housing unit, after excluding units which are likely to be non-market housing units. To determine which housing units to exclude we employ a simple criteria developed by the Department of Housing and Urban Development (HUD).

In specific, using internal administrative data,[11] HUD prepares estimates for the rent paid by public housing tenants in each of its regions, which it uses as thresholds or cut-offs. Housing units that pay a rent that is equal to or lower than this rent threshold or cut-off are considered to be either assisted housing or otherwise at a below-market rent.[12] See the Table 3 in the Appendix for a list of the rent thresholds used in each of the PFS payment localities.

We obtained the most recent rent cut-offs for over 4 thousand counties in the United States. The counties were classified and recoded following the 89 PFS payment localities.[13,14] Standard errors were computed using the replicate weights provided in the PUMS.

[8] Gross rent is the contract rent plus the estimated average monthly cost of utilities (electricity, gas, and water and sewer) and fuels (oil, coal, kerosene, wood, etc.) if these are paid by the renter (or paid for the renter by someone else). Gross rent is intended to eliminate differentials that result from varying practices with respect to the inclusion of utilities and fuels as part of the rental payment. The estimated costs of water and sewer, and fuels are reported on a 12-month basis but are converted to monthly figures for the tabulations.
[9] The U.S. Virgin Islands is excluded from the analysis for lack of a Community Survey.
[10] We must estimate these rents, since CMS does not publish the actual estimates used in preparing the GPCIs.
[11] To generate this "cut-off" rent, HUD uses administrative data on public housing rents from the Multifamily Tenant Characteristics System (MTCS). There are several advantages of using MTCS data to generate the cut-off rent. Regular availability of MTCS data allows HUD to update the cut-off rent annually. Second, there is enough MTCS data to generate cut-off rents at the geographic level of the 89 PFS payment localities.
[12] In fact, these housing units are excluded from HUD's Fair Market Rent (FMR) statistics.
[13] In those cases in which HUD uses a rent cut-off for part, but not all of, a PFS payment locality, we applied the rent cut-off to the entire PFS payment locality.

We test the following null hypothesis:

Ho: Controlling for differences in the prevalence of non-market housing does not significantly change the median gross rent of a 2-bedroom housing unit.

against the alternative hypothesis:

Ha: Controlling for differences in the prevalence of public housing does significantly change the median gross rent of a 2-bedroom housing unit

In order to compare the medians of the gross rent, we must employ a non-parametric test for two independent variables, known as the Mann-Whitney U test. All statistical significance tests were performed at a 95% confidence level.

[14] In those cases in which HUD used more than one rent cut-off for different parts of a PFS payment locality, we used the weighted median of the rent cut-offs. The weights used were the population estimates from the 2010 Census for each county.

IV. Results

After controlling for non-market rental housing, the median gross rent of a 2-bedroom housing unit changes in a statistically significant way in all PFS payment localities. See Table 1. This provides evidence to support the existence of a bias related to the differential prevalence of non-market housing in different parts of the United States and Puerto Rico.

Amongst all PFS payment localities, Puerto Rico obtains the lowest estimate for the median gross rent of a 2-bedroom housing unit ($360). Once HUD public housing rent thresholds are applied, Puerto Rico continues to receive the lowest estimate for the median gross-rent of a 2-bedroom housing unit ($510). But, in the case of Puerto Rico, this represents a statistically significant increase of 42%, markedly, the largest amongst all PFS payment localities. The second largest percent increase is experienced by New York, Manhattan (22%). See Figure 5.

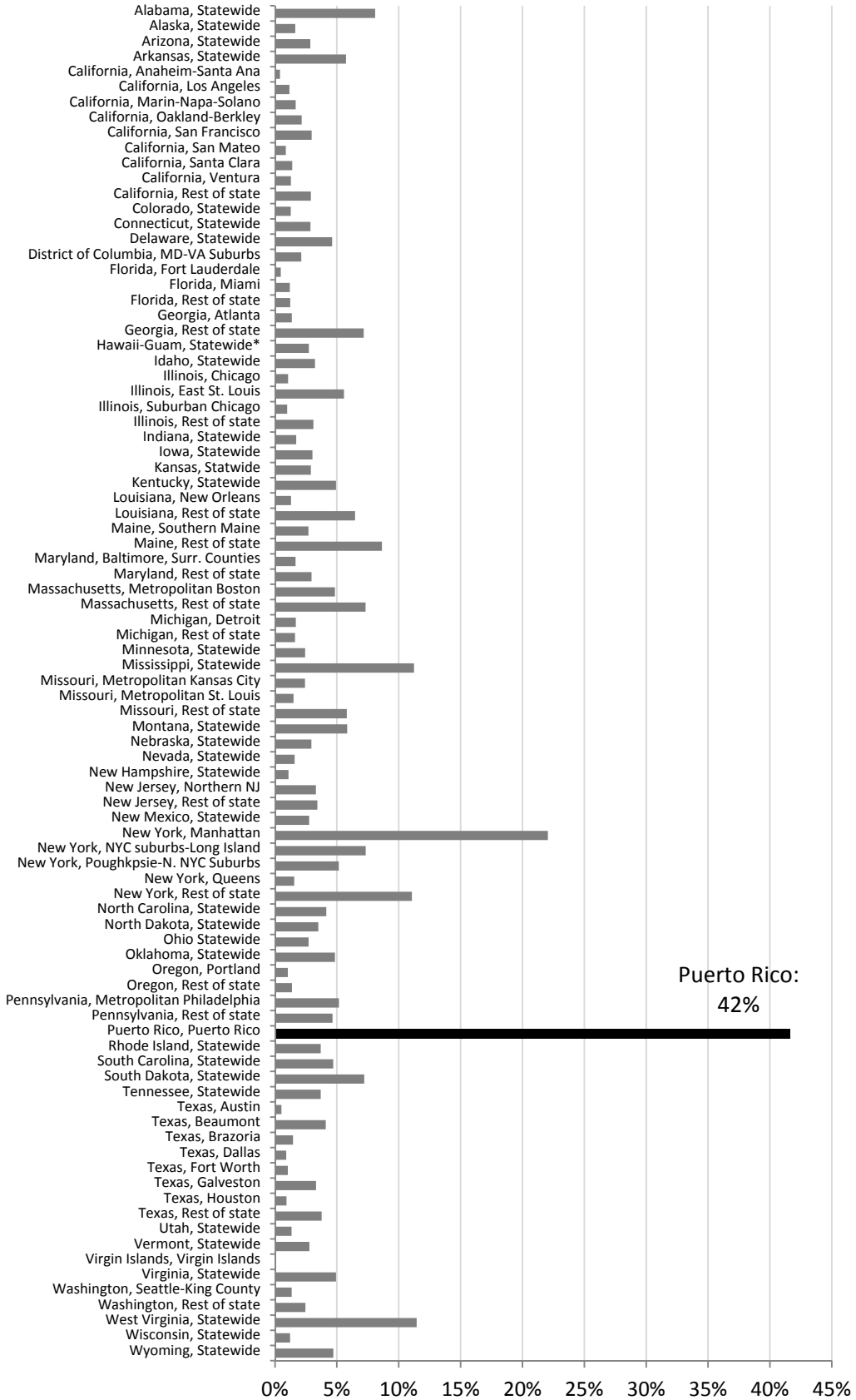
Table 1. Median Gross Rent for Two Bedrooms Housing Units by PFS payment locality: 2008-2010

Physicia Fee Schedule (PFS) Payment Locality Area	All renter-occupied housing units that pay cash rent					
	All units		All units with rent above HUD rent cut-off		Percent increase	Statistically significant change?
	Estimate	S.E.	Estimate	S.E.		
1 Alabama, Statewide	$630	±4	$681	±10	8%	YES
2 Alaska, Statewide	$976	±37	$992	±26	2%	YES
3 Arizona, Statewide	$840	±4	$864	±8	3%	YES
4 Arkansas, Statewide	$610	±5	$645	±10	6%	YES
5 California, Anaheim-Santa Ana	$1,484	±10	$1,490	±13	0%	YES
6 California, Los Angeles	$1,286	±9	$1,301	±6	1%	YES
7 California, Marin-Napa-Solano	$1,260	±19	$1,281	±26	2%	YES
8 California, Oakland-Berkley	$1,296	±13	$1,324	±14	2%	YES
9 California, San Francisco	$1,690	±48	$1,740	±29	3%	YES
10 California, San Mateo	$1,606	±43	$1,620	±43	1%	YES
11 California, Santa Clara	$1,504	±34	$1,525	±13	1%	YES
12 California, Ventura	$1,403	±25	$1,421	±23	1%	YES
13 California, Rest of state	$1,001	±6	$1,030	±6	3%	YES
14 Colorado, Statewide	$860	±10	$871	±7	1%	YES
15 Connecticut, Statewide	$1,047	±11	$1,077	±16	3%	YES
16 Delaware, Statewide	$952	±24	$996	±22	5%	YES
17 District of Columbia, MD-VA Suburbs	$1,363	±18	$1,392	±38	2%	YES
18 Florida, Fort Lauderdale	$1,067	±10	$1,072	±9	0%	YES
19 Florida, Miami	$1,084	±11	$1,097	±7	1%	YES
20 Florida, Rest of state	$890	±5	$901	±4	1%	YES
21 Georgia, Atlanta	$885	±7	$897	±8	1%	YES
22 Georgia, Rest of state	$642	±10	$688	±10	7%	YES
23 Hawaii-Guam, Statewide*	$1,316	±28	$1,352	±44	3%	YES
24 Idaho, Statewide	$650	±11	$671	±11	3%	YES
25 Illinois, Chicago	$940	±6	$950	±7	1%	YES
26 Illinois, East St. Louis	$681	±16	$719	±9	6%	YES
27 Illinois, Suburban Chicago	$1,013	±16	$1,023	±15	1%	YES
28 Illinois, Rest of state	$678	±14	$699	±6	3%	YES
29 Indiana, Statewide	$700	±2	$712	±7	2%	YES
30 Iowa, Statewide	$661	±8	$681	±10	3%	YES
31 Kansas, Statwide	$690	±12	$710	±9	3%	YES
32 Kentucky, Statewide	$608	±10	$638	±7	5%	YES
33 Louisiana, New Orleans	$930	±15	$942	±18	1%	YES
34 Louisiana, Rest of state	$680	±7	$724	±7	6%	YES
35 Maine, Southern Maine	$925	±24	$950	±28	3%	YES
36 Maine, Rest of state	$671	±17	$729	±15	9%	YES
37 Maryland, Baltimore, Surr. Counties	$1,084	±11	$1,102	±10	2%	YES
38 Maryland, Rest of state	$915	±24	$942	±24	3%	YES
39 Massachusetts, Metropolitan Boston	$1,281	±19	$1,343	±16	5%	YES
40 Massachusetts, Rest of state	$915	±15	$982	±15	7%	YES
41 Michigan, Detroit	$830	±8	$844	±13	2%	YES
42 Michigan, Rest of state	$680	±4	$691	±9	2%	YES
43 Minnesota, Statewide	$820	±10	$840	±12	2%	YES
44 Mississippi, Statewide	$632	±14	$703	±12	11%	YES
45 Missouri, Metropolitan Kansas City	$742	±11	$760	±15	2%	YES
46 Missouri, Metropolitan St. Louis	$800	±13	$812	±12	1%	YES
47 Missouri, Rest of state	$586	±12	$620	±5	6%	YES
48 Montana, Statewide	$651	±14	$689	±19	6%	YES
49 Nebraska, Statewide	$680	±11	$700	±14	3%	YES
50 Nevada, Statewide	$945	±10	$960	±10	2%	YES
51 New Hampshire, Statewide	$1,006	±12	$1,017	±14	1%	YES
52 New Jersey, Northern NJ	$1,210	±17	$1,250	±17	3%	YES
53 New Jersey, Rest of state	$1,108	±16	$1,146	±15	3%	YES
54 New Mexico, Statewide	$690	±9	$709	±9	3%	YES
55 New York, Manhattan	$1,147	±61	$1,400	±43	22%	YES
56 New York, NYC suburbs-Long Island	$1,118	±8	$1,200	±12	7%	YES
57 New York, Poughkpsie-N. NYC Suburbs	$1,027	±27	$1,080	±20	5%	YES
58 New York, Queens	$1,270	±24	$1,300	±12	2%	YES
59 New York, Rest of state	$732	±8	$813	±15	11%	YES
60 North Carolina, Statewide	$700	±2	$729	±5	4%	YES
61 North Dakota, Statewide	$599	±14	$620	±12	3%	YES
62 Ohio Statewide	$700	±2	$719	±7	3%	YES
63 Oklahoma, Statewide	$640	±6	$671	±6	5%	YES
64 Oregon, Portland	$871	±6	$880	±9	1%	YES
65 Oregon, Rest of state	$730	±4	$740	±6	1%	YES
66 Pennsylvania, Metropolitan Philadelphia	$967	±15	$1,017	±11	5%	YES
67 Pennsylvania, Rest of state	$709	±10	$742	±6	5%	YES
68 Puerto Rico, Puerto Rico	$360	±12	$510	±8	42%	YES
69 Rhode Island, Statewide	$920	±16	$954	±12	4%	YES
70 South Carolina, Statewide	$680	±4	$712	±7	5%	YES
71 South Dakota, Statewide	$610	±14	$654	±19	7%	YES
72 Tennessee, Statewide	$676	±8	$701	±7	4%	YES
73 Texas, Austin	$955	±13	$960	±11	1%	YES
74 Texas, Beaumont	$731	±38	$761	±29	4%	YES
75 Texas, Brazoria	$825	±55	$837	±29	1%	YES
76 Texas, Dallas	$876	±8	$884	±10	1%	YES
77 Texas, Fort Worth	$865	±14	$874	±11	1%	YES
78 Texas, Galveston	$874	±51	$903	±39	3%	YES
79 Texas, Houston	$861	±7	$869	±11	1%	YES
80 Texas, Rest of state	$742	±4	$770	±6	4%	YES
81 Utah, Statewide	$750	±5	$760	±8	1%	YES
82 Vermont, Statewide	$900	±15	$925	±41	3%	YES
83 Virgin Islands, Virgin Islands	n/a	n/a	n/a	n/a	n/a	n/a
84 Virginia, Statewide	$851	±7	$893	±9	5%	YES
85 Washington, Seattle-King County	$1,114	±15	$1,129	±13	1%	YES
86 Washington, Rest of state	$815	±11	$835	±10	2%	YES
87 West Virginia, Statewide	$559	±9	$623	±14	11%	YES
88 Wisconsin, Statewide	$740	±2	$749	±10	1%	YES
89 Wyoming, Statewide	$658	±14	$689	±30	5%	YES

* The 23rd PFS payment locality includes Hawaii and Guam. However, because Guam does not participate in the Community Surveys, it is excluded in this analysis.

Source: Public Use Microdata Sample (PUMS), American Community Survey (ACS) and Puerto Rico Community Survey (PRCS), 3-year estimate 2008-2010, U.S. Census Bureau. Standard errors are calculated using replicating weights.

Figure 5. Percent increase in median gross rent after removing non-market housing units



V. Discussion

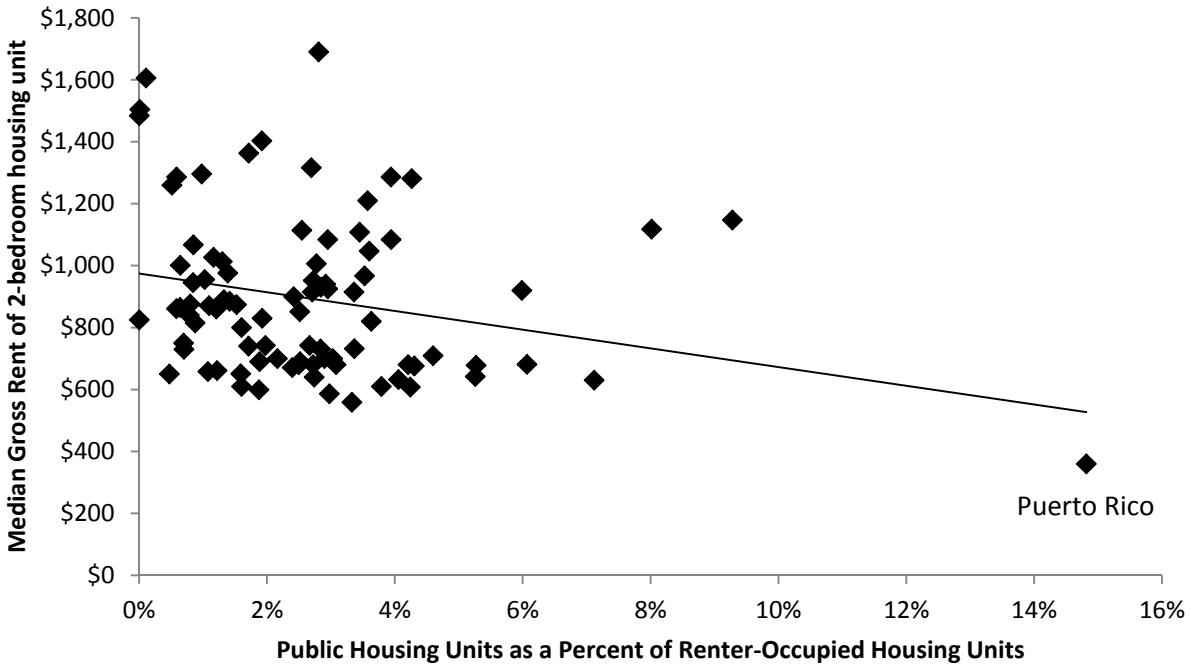
How do we know there is a bias?

This research note presents evidence that the ACS/PRCS-based estimates of the median gross rent of 2-bedroom housing units are statistically different when we apply HUD rent thresholds to exclude housing units whose rent is so low that they are considered to be either assisted housing or otherwise at a below-market rent.

The relative prevalence of this type of non-market housing across different parts of the United States and Puerto Rico has little (if anything) to do with commercial rent markets for medical offices and facilities in different parts of the United States and Puerto Rico.

Therefore, the use of uncontrolled residential rent estimates to proxy for commercial rents introduces a bias related to the relative prevalence of non-market housing across different parts of the United States and Puerto Rico. Current CMS practice includes the use of these biased uncontrolled residential rent estimates. Figure 6 highlights the situation for Puerto Rico.

Figure 6. Median Gross Rent by Percent of Renter-Occupied Housing Units



Source: American and Puerto Rico Community Survey, U.S. Census Bureau, 2010 3-year estimates (vertical axis). Residents Characteristics Report, Department of Housing and Urban Development (HUD) as of May 31, 2015, and American and Puerto Rico Community Survey, U.S. Census Bureau 2013 5-year estimates (horizontal axis).
Note: The horizontal axis presents the number of Annual Contributions Contracts (ACC) that were awarded in public housing facilities from HUD, as a percent of the number of renter-occupied housing units estimated in the ACS/PRCS.

Does it have a meaningful impact on the GPCIs of any payment locality?

Our results indicate that physicians and surgeons in Puerto Rico have been affected more by this statistical bias than physicians and surgeons in any part of the United States.

In the latest review, the Practice Expense GPCI had a cost share weight of 44.839 percent, of which 10.223 percentage points owed to the Office Rent component.[15] Therefore, a 42% increase in the Median Gross Rent used as a proxy for the Office Rent component implies an increase of Puerto Rico's GPCI by about 4%, or equivalently an increase of the Practice Expense GPCI of Puerto Rico by about 10%.

What about any impacts on the broader economy and health care sector?

In order to gauge the impact of the Public Housing Prevalence Bias on the overall Health Care sector in Puerto Rico, the Puerto Rico Institute of Statistics formed a panel of health care experts to independently assess the potential economic impact of this bias. In specific, we invited a group of health care experts[16] to prepare estimates on the total impact of a 10% increase in Puerto Rico's Practice Expense GPCI on Medicare receipts by entities in Puerto Rico.

The calculation of such estimates relies on numerous assumptions that need to be made about the way in which such an increase would be implemented. However, to simplify matters, we provided panel members with ample flexibility to make the assumptions necessary to provide a very rough estimate of the total impact of the bias. Here is a summary of the results:

- Between $7 and $15 million in additional annual expenses through Medicare Part B's Fee For Service would be paid to Puerto Rico physicians directly.

- Between $50 and $60 million in additional expenses would be paid through Medicare Advantage, on account of the resulting increase in the benchmark.

Therefore, total direct economic impact is between $57 and $75 million annually. Moreover, taking into account indirect and induced multiplier effects, the total impact on the health care sector could rise to as high as $120 million annually.

[15] See https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/PhysicianFeeSched/Downloads/CY2015-PFS-FR-GPCI.pdf.

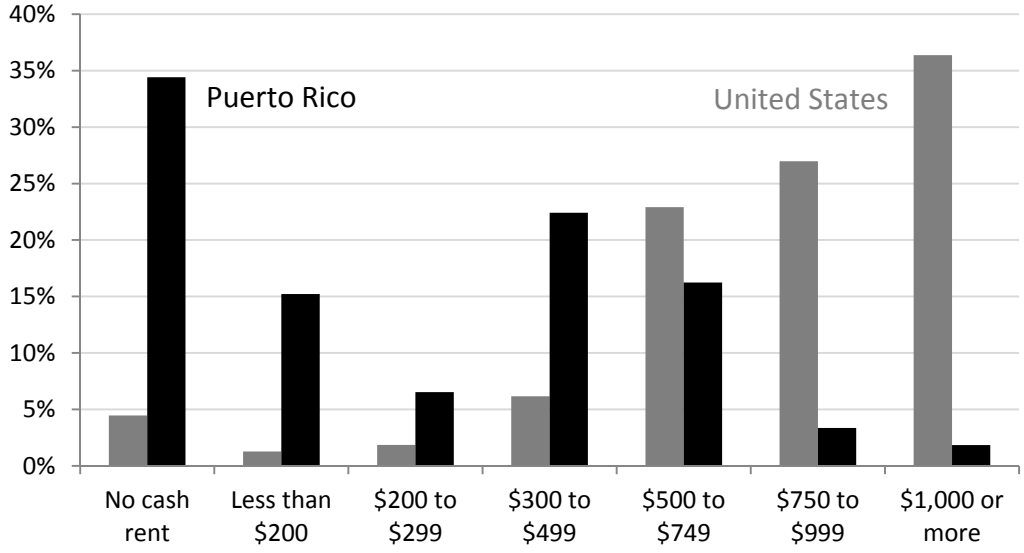
[16] The panel was composed of Dr. Jose E. Laborde, President, JEL Consulting Inc., a private health care analytics company that advises the Puerto Rico Health Insurance Administration, and Mr. Roberto Pando, Senior VP Strategy, Medical Card System, Inc., one of the main health insurance providers in Puerto Rico.

Are there any additional sources of potential bias?

Yes. Figure 7 presents the distribution of the gross rent of a 2-bedroom housing unit in the United States and Puerto Rico. In this chart, we also include the housing units that pay no cash rent. In Puerto Rico almost 35 percent of 2-bedroom renter-occupied housing units pay no cash rent. In the United States, this only occurs in less than 5 percent of units. A sizable gap also exists in housing units that pay cash rents for less than $200 a month.

This gap can be attributed to several types of factors, including socio cultural differences, as well as socio economic differences of the residents of Puerto Rico. These factors have no bearing or any relation to the cost of providing medical services.

Figure 7. Distributions of Gross Rent of a 2-Bedroom Housing Unit



Source: American and Puerto Rico Community Survey, U.S. Census Bureau, 2013 3-year estimates.

Is there any source of data that controls for differences in the prevalence of public housing?

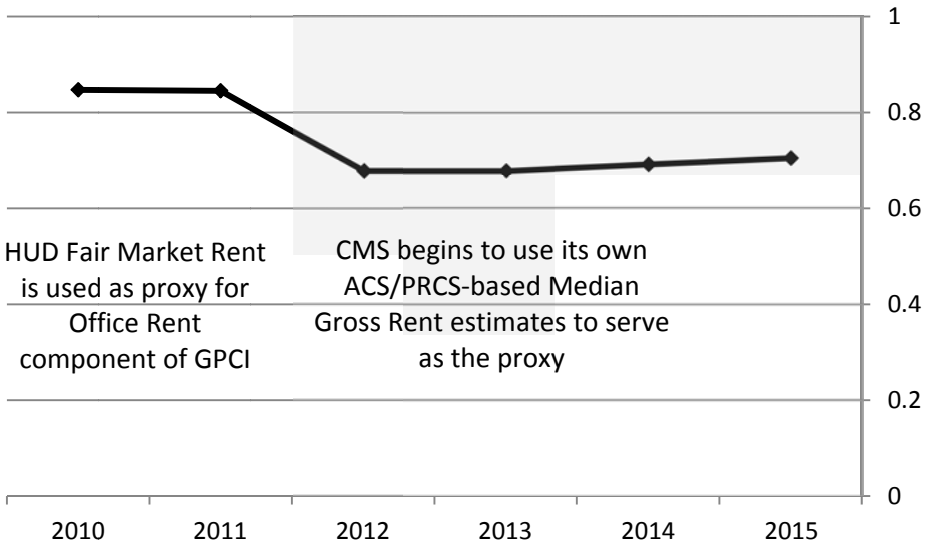
Yes, the Fair Market Rent (FMR) estimated by the Department of Housing and Urban Development (HUD). This statistical product is produced by HUD using ACS/PRCS median gross rent data, amongst other sources of historical information. The FMR is the rent used by HUD in the implementation of its Section 8 housing subsidies. In addition to the non-market housing thresholds, the housing experts at HUD take into account differences in the quality of the housing stock in different parts of the United States and Puerto Rico, amongst other factors that can bias rent statistics. For more details on the FMR methodology, see: http://www.huduser.org/portal/datasets/fmr.html.

For how long has this been going on?

Prior to Calendar Year 2012, CMS used FMR estimates as the proxy for the Office rent component of the GPCI. In fact, when CMS used HUD's FMR as the proxy before Calendar Year 2012, the Practice Expense GPCI for Puerto Rico was higher than it is today.

Moreover, Puerto Rico's Practice Expense GPCI fell by 20 percent the first year that CMS replaced HUD's FMR data with its own ACS/PRCS median gross rent estimates. See Figure 8. This was the largest drop of any of the 89 PFS payment localities.

Figure 8. Puerto Rico's Practice Expense GPCI



Source: Addendum E: Geographic Practice Cost Indices, Physician Fee Schedule, CY 2012-2015.

The identification of the Public Housing Prevalence Bias, which has been undertaken in this study, should prompt policymakers to immediately correct this situation which has gone on long enough.

Are there any additional data sources that control for these aspects as well?

The Council for Community and Economic Research's (C2ER) Cost-of-Living Index (COLI) provides reference prices in more than 300 urban and other areas in the United States. It employs a simple methodology that attempts to measure the cost-of-living for a specific standard of living.

COLI is designed to answer the following question: How do urban areas compare in the cost of maintaining a standard of living appropriate for moderately affluent professional and managerial households?

We would argue that the relative gross rent costs of such a household in different parts of the country is a better proxy for the cost necessary to rent a space for a doctor's office that is adequate in terms of space and quality for the provision of medical services. After all, a physician's office contains sensitive equipment and supplies that need to be stored securely in a temperature-controlled environment. State and local health regulations do not allow a doctor to setup an office in an inadequate facility. Said in another way, physicians are very likely to use high-quality commercial office spaces. In this same vein, the housing units considered in the estimation of the median gross rent should include only the relatively more high-quality housing units that tend to attract moderately affluent professional and managerial households.

The COLI methodology includes a basket with 57 categories, including the following relevant categories:

I) Apartment Rent

Apartment complexes sampled must be suitable for a childless professional and managerial couple with household income in the top 20% for their area. They are required to be suitable for a professional or managerial couple in terms of commuting, shopping, entertainment needs, and neighborhood quality. Apartment complexes should be no more than 10 years old. Sampled apartments should be 950 sq.ft. or pro-rated to an equivalent of 950 sq.ft. Sample apartments should be unfurnished, with 2 bedrooms and 1½ or 2 baths, amongst other criteria.

II) Total Energy Costs

COLI takes great care in incorporating different types of energy costs for the household, as these vary across the United States and Puerto Rico. C2ER has developed a computer model that incorporates local weather data from the National Oceanographic & Atmospheric Administration. This model allows COLI to measure the total energy costs from an equivalent level of consumption expected of a moderately affluent professional and managerial household.

According to the COLI results for the first quarter of 2015, apartment rents (as specified above) and total energy costs in the San Juan, Puerto Rico Metropolitan Statistical Area (MSA) are estimated to be about $848 and $438 per month, respectively. Summing these components provides a partial estimate of gross rents, which we believe is very illustrative: $1,286 per month. See Table 2.

This places Puerto Rico's gross rent in between major metropolitan areas of the United States, such as the Chicago, Illinois Metropolitan Statistical Area (MSA) with an estimate of $1,326 per month, and Beaumont, TX MSA with an estimate of $1,218 per month. Despite this observation, the median gross rent estimate from the ACS/PRCS that are used by CMS for Puerto Rico ($360) are less than half of the estimate used for Beaumont, TX ($731).

Table 2. Comparison of gross rent estimates: COLI versus ACS/PRCS

	COLI – 1st quarter of 2015			Median Gross Rent for 2-bedroom housing unit from ACS/PRCS	CY 2015 Practice Expense GPCI
	Apartment rent	Energy	Sum		
Chicago, IL MSA	$1,158	$168	$1,326	$940	1.037
San Juan, PR MSA	$848	$438	$1,286	$360	0.705
Beaumont, TX MSA	$1,045	$173	$1,218	$731	0.902

VI. Recommendations

1. Correct for the Public Housing Prevalence Bias in the Office Rent component of Puerto Rico Geographic Practice Cost Index

   There are a number of ways to do this:

   a) Exclude housing units with rents below the non-market housing rent thresholds developed by the U.S. Department of Housing and Urban Development (HUD), when estimating the median gross rents.

   b) Return to using the Fair Market Rents (FMR) of HUD. The FMR is calculated with great care to control for differences in the quality of the housing stock, as well as for the prevalence of non-market housing. It is also based on the median gross rents obtained from ACS/PRCS. It is available in relatively smaller geographies (not just statewide), and can be easily converted to the PFS payment localities.

   c) Tie Puerto Rico's office rent to a specific geography in the United States, for instance to Beaumont, TX or to Chicago, IL.[17]

2. Implement one of the above corrections immediately.

   We estimate that the health care sector of Puerto Rico is losing almost $120 million annually as a result of this statistical bias. The bias was first introduced in Calendar Year 2012. Therefore, over the course of the 3-year period between 2012 and 2015, the total income lost to Puerto Rico's health care sector rises to $360 million. It only took one year to implement this bias and in the process reduce Puerto Rico's GPCI. It should not take any longer than one year to implement the correction to this bias.

[17] A similar strategy has been followed for the U.S. Virgin Islands in the past due to data quality issues.

VII. Conclusion

CMS's use of uncontrolled residential rent estimates in different regions of the United States and Puerto Rico introduces a bias in the calculation of the Office Rent component of the GPCIs. In specific, the Public Housing Prevalence Bias, identified in this report, causes an underestimation in the uncontrolled median gross residential rent estimates in those regions with relatively large segments of the population living in public housing. This federal statistical bias costs the Puerto Rico economy an estimated $120 million annually. Policymakers need to immediately correct this bias. We have presented several potential methods that could be used to correct for this bias.

References

Junta de Planificación (2010). Multiplicadores Interindustriales de Puerto Rico: Insumo-Producto 2002. Obtained from: http://www.jp.pr.gov/Portal_JP/LinkClick.aspx?link=http%3a%2f%2fgis.jp.pr.gov%2fExterno_Econ%2fMultiplicadores%2fMultiplicadores+Interindustriales+2002.pdf&tabid=299&mid=969

Appendix

Table 3: Relation between the PFS localities and the 2000 PUMAs

PFS Locality	Counties	2000 PUMA	Rent cut-off
1) Alabama	(statewide)	0100100 thru 0102600	$269
2) Alaska	(statewide)	0200101 thru 0200400	$347
3) Arizona	(statewide)	0400101 thru 0400900	$414
4) Arkansas	(statewide)	0500100 thru 0501900	$262
5) Anaheim/Santa Ana, CA	Orange	0606801 thru 0607607	$414
6) Los Angeles, CA	Los Angeles	0604500 thru 0606120, and 0606122 thru 0606126	$414
7) Marin/Napa/Solano, CA	Marin, NAPA, and Solano	0601000 thru 0601303	$414
8) Oakland/Berkeley, CA	Alameda and Contra Costa	0602101 thru 0602108, and 0602401 thru 0602410	$414
9) San Francisco, CA	San Francisco	0602201 thru 0602207	$414
10) San Mateo, CA	San Mateo	0602301 thru 0602306	$414
11) Santa Clara, CA	Santa Clara	0602701 thru 0602714	$414
12) Ventura, CA	Ventura	0606200 thru 0606602	$414
13) Rest of California	all except	0600100 thru 0600900, 0601401 thru 0602002, 0602500 thru 0602602, 0602801 thru 0604407, 0606121, 0606701, 0606702, and 0607700 thru 0608200	$414
14) Colorado	(statewide)	0800101 thru 0801000	$325
15) Connecticut	(statewide)	0900100 thru 0902500	$416
16) Delaware	(statewide)	1000101 thru 1000300	$495
17) DC + MD/VA Suburbs	District of Columbia; Alexandria City, Arlington, Fairfax, Fairfax City, Falls Church City in Virginia; Montgomery and Prince George's in Maryland	1100101 thru 1100105, 2401001 thru 2401107, and 5100100 thru 5100305	$313
18) Ft. Lauderdale, FL	Broward, Collier, Indian River, Lee, Martin, Palm Beach, and St. Lucie	1203200 thru 1203903	$269
19) Miami, FL	Dade and Monroe	1204001 thru 1204020	$269
20) Rest of Florida	all except	1200101 thru 1203100	$269
21) Atlanta, GA	Butts, Cherokee, Clayton, Cobb, Dekalb, Douglas, Fayette, Forsyth, Fulton, Gwinnett, Henry, Newton, Paulding, Rockdale and Walton	1300700 thru 1302000	$269
22) Rest of Georgia	all except	1300100 thru 1300600, and 1302100 thru 1304300	$269
23) Hawaii	(statewide)	1500100 thru 1500307	$414
24) Idaho	(statewide)	1600100 thru 1600900	$347
25) Chicago, IL	Cook	1703401 thru 1703519	$257
26) East St. Louis, IL	Bond, Calhoun, Clinton, Jersey, Macoupin, Madison, Monroe, Montgomery, Randolph, St. Clair, and Washington	1700400, 1700500, and 1701000 thru 1701202	$257
27) Suburban Chicago, IL	Dupage, Kane, Lake, and Will	1703003 thru 1703305	$257
28) Rest of Illinois	all except	1700101 thru 1700300, 1700600 thru 1700900, and 1701300 thru 1703002	$257
29) Indiana	(statewide)	1800100 thru 1803800	$257
30) Iowa	(statewide)	1900100 thru 1901900	$289
31) Kansas	(statewide)	2000100 thru 2001600	$289
32) Kentucky	(statewide)	2100100 thru 2102500	$269
33) New Orleans, LA	Jefferson, Orleans, Plaquemines, and St. Bernard	2201801 thru 2201905	$262

PFS Locality	Counties	2000 PUMA	Rent cut-off
34) Rest of Louisiana	all except	2200101 thru 2201700, and 2202001 thru 2202500	$262
35) Southern Maine	Cumberland and York	2300100 thru 2300400	$416
36) Rest of Maine	all except	2300500 thru 2301000	$416
37) Baltimore/Surr. counties, MD	Anne Arundel, Baltimore, Baltimore City, Carroll, Harford and Howard	2400400 thru 2400602, 2400801 thru 2400902, and 2401201 thru 2401204	$313
38) Rest of Maryland	all except	2400100 thru 2400300, 2400700, and 2401300 thru 2401600	$313
39) Metropolitan Boston	Middlesex, Norfolk, and Suffolk	2500300 thru 2500600, 2501300, 2501400, 2502400 thru 2504000	$416
40) Rest of Massachusetts	all except	2500100, 2500200, 2500700 thru 2501200, 2501500 thru 2502300, and 2504100 thru 2504800	$416
41) Detroit, MI	Macomb, Oakland, Washtenaw and Wayne	2602501 thru 2602508, 2603200, 2603300, 2603600 thru 2604104	$257
42) Rest of Michigan	all except	2600100 thru 2602400, 2602601 thru 2603100, 2603400, 2603500	$257
43) Minnesota	(statewide)	2700100 thru 2702500	$257
44) Mississippi	(statewide)	2800100 thru 2802300	$269
45) Metropolitan Kansas City, MO	Clay, Jackson, and Platte	2900800 thru 2901100	$289
46) Metropolitan, St. Louis, MO	Jefferson, St. Charles, St. Louis, and St. Louis City	2901601 thru 2901900	$257
47) Rest of Missouri	all except	2900100 thru 2900700, 2901200 thru 2901500, 2902000 thru 2902700	$289
48) Montana	(statewide)	3000100 thru 3000700	$325
49) Nebraska	(statewide)	3100100 thru 3100904	$289
50) Nevada	(statewide)	3200100 thru 3200511	$414
51) New Hampshire	(statewide)	3300100 thru 3301100	$416
52) Northern New Jersey	Bergen, Essex, Hudson, Hunterdon, Middlesex, Morris, Passaic, Somerset, Sussex, Union, and Warren	3400301 thru 3401002, and 3401301 thru 3401903	$495
53) Rest of New Jersey	all except	3400101 thru 3400200, 3401101 thru 3401203, and 3402001 thru 3402400	$495
54) New Mexico	(statewide)	3500100 thru 3501100	$262
55) Manhattan, NY	New York	3603801 thru 3603810	$495
56) NYC Suburbs/Long Island, NY	Bronx, Kings, Nassau, Richmond, Rockland, Suffolk, and Westchester	3603400 thru 3603505, 3603601 thru 3603710, 3603901 thru 3604018, and 3604114 thru 3604312	$495
57) Poughkpsie/NYC	Columbia, Delaware, Dutchess, Greene, Orange, Putnam, Sullivan, and Ulster	3601900, 3602500, 3603101 thru 3603303, 3603506	$495
58) Queens, NY	Queens	3604101 thru 3604114	$495
59) Rest of New York	all except	3600100 thru 3601800, 3602000 thru 3602402, and 3602601 thru 3603000	$495
60) North Carolina	(statewide)	3700100 thru 3704800	$269
61) North Dakota	(statewide)	3800100 thru 3800500	$325
62) Ohio	(statewide)	3900100 thru 3904800	$257
63) Oklahoma	(statewide)	4000100 thru 4001700	$262
64) Portland, OR	Clackamas, Multnomah, and Washington	4101301 thru 4101313	$347
65) Rest of Oregon	all except	4100100 thru 4101200	$347
66) Metropolitan Philadelphia, PA	Bucks, Chester, Delaware, Montgomery, and Philadelphia	4203901 thru 4204303	$495
67) Rest of Pennsylvania	all except	4200100 thru 4204303	$313

PFS Locality	Counties	2000 PUMA	Rent cut-off
68) Puerto Rico	(statewide)	7202500 thru 7200500	$269
69) Rhode Island	(statewide)	4400100 thru 4400700	$416
70) South Carolina	(statewide)	4500100 thru 4502300	$269
71) South Dakota	(statewide)	4600100 thru 4600700	$325
72) Tennessee	(statewide)	4700100 thru 4703202	$269
73) Austin, TX	Travis	4805301, 4805302, and 4805304 thru 4805402	$262
74) Beaumont, TX	Jefferson	4804300 and 4804400	$262
75) Brazoria, TX	Brazoria	4804801 and 4804802	$262
76) Dallas, TX	Dallas	4802301 thru 4802315	$262
77) Ft. Worth, TX	Tarrant	4802501 thru 4802511	$262
78) Galveston, TX	Galveston	4804901 and 4804902	$262
79) Houston, TX	Harris	4804601 thru 4804625	$262
80) Rest of Texas	all except	4800100 thru 4802202, 4802400, 4802600 thru 4804200, 4804501 thru 4804503, 4804701, 4804702, 4805000 thru 4805202, 4805303, 4805500 thru 4806900	$262
81) Utah	(statewide)	4900100 thru 4900700	$325
82) Vermont	(statewide)	5000100 thru 5000400	$416
83) Virgin Islands	(statewide)	n/a	n/a
84) Virginia	All Counties, except Alexandria City, Arlington, Fairfax, Fairfax City, and Falls Church City	5100400 thru 5103500	$313
85) Seattle (King County), WA	King	5301801 thru 5302009	$347
86) Rest of Washington	all except	5300100 thru 5301702, and 5302101 thru 5302200	$347
87) West Virginia	(statewide)	5400100 thru 5401200	$313
88) Wisconsin	(statewide)	5500100 thru 5502500	$257
89) Wyoming	(statewide)	5600100 thru 5600400	$325