New York City Government Poverty Measure 2005–2016

An Annual Report from the Office of the Mayor

Appendix H: Medical Out-Of-Pocket Expenditures

NYC Opportunity

Appendix H

Medical Out-of-Pocket Expenditures

Following the National Academy of Sciences' (NAS) recommendation, the NYCgov measure of income is net of what families spend for their medical care. Medical out-of-pocket expenditures (MOOP) are the sum of co-pays, deductibles, and the cost of health services that are not covered by insurance, including health insurance premiums. Since the American Community Survey (ACS) does not report this information, it must be imputed from an outside data source. We use the Medical Expenditures Panel Survey (MEPS) to impute the two components of MOOP (i.e., premiums and spending on medical care services) into the ACS.

To disaggregate the impacts of out-of-pocket expenses on premiums from medical spending, we impute premiums separately from medical spending. We use a predictive mean matching (PMM) method – a statistical matching technique that uses nearest neighbor algorithms – to identify and link similar units between the MEPS and ACS data. There are two distinct aspects of our application of PMM in MOOP imputations. First, the distance in PMM is constructed based on the conditional expected values estimated through a two-part model. The two-part models are chosen to account for the skewed distribution of medical costs with a large proportion of zero values. In addition, a few important determinants of premiums and medical spending were used as matching criteria. This is to further ensure that the important joint distributions are preserved for the subsequent data analysis.

In the sections below, we provide more details on the MEPS – the source data from which we draw imputed values, our predictive mean matching methodology, and a brief evaluation of its performance.

Source Data: MEPS

MEPS data provide national estimates of health care utilization, expenditures, source of payments, and health insurance coverage for the U.S. civilian non-institutionalized population. The survey uses an overlapping panel design, introducing a new panel each year. For each panel, the data are collected through a series of five rounds of interviews covering a two-year span. The data from the overlapping panels are then used to produce annual estimates. Although it supports annual estimates, the information on premiums is limited to private health insurance coverage and collected only once per panel, at the beginning of the first round of each year's survey. In a later section, we discuss in detail how we remediate the lack of information on premiums paid for public coverage.

As source data for our MOOP imputation, the MEPS has several key advantages over other surveys. First, it captures the changing dynamics of health insurance coverage status during the reference year (e.g., month-to-month change in coverage status and type, and durations without coverage) and the relationship between insurance and health care expenditures. Second, it measures MOOP with greater accuracy. Specifically, the MEPS collects health care expenses for all survey participants for each medical event (hospital stays, office visits, prescription drugs, and other health care services and supplies) experienced in a given year, the participants' health conditions, and the amount from each payment source (private, Medicare, Medicaid, and self or family). The MEPS then uses medical provider data to verify and replace, if needed, information about spending for health care events reported by a household.

Our sample of donor cases is constructed by linking a family of two interrelated 2015 MEPS data files: the Full Year (FY) and the Person Round Plan Public Use (PRPL) files. The former contains all the information pertaining to medical expenses. The latter provides monthly premiums paid out-of-pocket by the policyholder for each private plan held at the beginning of each data collection year. It also states whether the reported plan was active for at least a day per month throughout 2015, enabling calculation of total premium payment for the duration of enrollment. Linking the PRPL file to the FY file requires a careful consideration of the complex structure of the MEPS data. If an individual began their private insurance coverage in the middle of the year, a premium value would not be recorded in the PRPL file. To bypass this limitation, we summarize each person's and family's coverage status and type, based on the coverage reported at the beginning of the year. The text box below further describes health insurance typology.

We also limit the premium records in MEPS PRPL files to those insurance plans providing a comprehensive health care plan that provides physician and hospital coverage. The exclusion of premiums paid for stand-alone insurance plans that provide dental, vision, or prescription coverage only is necessary because those are not captured in the ACS. Total premiums paid by the family are aggregated at the health insurance unit (HIU) level – the subfamily unit in which all family members would be eligible for coverage under one family plan (see HIU text box below). This

Health Insurance Typology

We summarize health insurance coverage for a nonelderly adult using five types of coverage, and create the following categorical summary variables of insurance coverage by their type and composition:

1. Employer Sponsored Insurance (ESI) Only: Individuals and family members covered by an insurance policy sponsored by a current or former employer; this includes Veterans Affairs (VA) related insurance plans.

2. Non-ESI Private Only: Individuals and family members covered by a private non-group plan, including plans purchased through a state exchange

3. Public and Private Insurance: Individuals and family members covered by both public and private insurance

4. Public Only: Individuals and family members covered by public only, i.e., Medicaid, Medicare, or State Children's Health Insurance Program (SCHIP)

5. Uninsured: Individuals and family members uninsured for the entire calendar year

The five categorical summary variables of insurance coverage for elderly adults include:

1. Medicare Only: Person is covered by Medicare only

2. Medicare and Private Insurance: Person is covered by both Medicare and private coverage (private coverage includes CHAMP, VA, and insurance sponsored by a current or former employer)

3. Medicare and Medicaid: Person is covered by both Medicaid and Medicare

4. Private or Medicaid: Person without Medicare who reports having private or public coverage other than Medicare

5. Uninsured: Person is uninsured for the entire calendar year

is necessary because unlike the MEPS, the ACS does not collect information on policyholder status and thus aggregation to a proper unit is required. In addition, because MEPS data lag the ACS by a year, in order to bring them to 2016 values all measures of MOOP are adjusted for inflation using the medical care component of the Consumer Price Index for All Urban Consumers (CPI-U).[1]

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1 For further information about the MEPS, see the Agency for Healthcare Research and Quality website at: http://meps.ahrq.gov/mepsweb

Construction of Health Insurance Unit (HIU)

Following the MEPS definition of HIU, we use the following rules to identify who should be in the same HIU for the ACS families:

1. An adult, his or her spouse, and their unmarried biological, adopted, or step children under age 19 are inseparable.

2. Full-time college students ages 19 to 23 should also be placed in their parent's HIU; the result is a change in how we create NYCgov poverty units. Health insurance units take priority over tax unit assignment of young adults. (See Appendix A for further discussion of this change.)

3. Married minors compose their own HIUs.

4. Unmarried children without parents present in the household are put in a nearest blood relatives' health insurance unit, including grandparents or great-grandparents.

5. Foster children form a separate health insurance unit from their foster parents.

Remediating Missing Premiums for Public Coverage

As mentioned above, the MEPS does not collect information on premiums paid for public insurance coverage plans, including Medicaid, the State Children's Health Insurance Program (SCHIP), and Medicare Part B. As a remedy, we simulate program rules in order to logically impute missing premiums for those who are covered by public health insurance coverage. The Family Health Plus Program, New York State's Medicaid program, does not require recipients to contribute toward the premium. Thus we assign zero premium costs to those who reported Medicaid coverage.

To assign Child Health Plus premiums, we look at all children identified as public insurance recipients. We aggregate incomes for everyone in the same health insurance unit and compare that against the Federal Poverty Line (FPL). Families are required to pay a monthly per-child premium based on their income's percentage of the FPL. For all categories of participants there is also a family cap. For example, families with incomes between 160 percent and 222 percent of the FPL are required to pay a premium of $9 per child, per month. The premium is capped at the payment for three children ($27 per family, per month).[2]

We assume all people identified in the MEPS as Medicare recipients have Medicare Part B, given the observed underreporting in the data. All Medicare

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2 We use the health insurance unit as opposed to the family unit when capping the premium.

recipients with incomes above 135 percent of the FPL are required to pay a monthly premium for Medicare Part B. If the Medicare participant is not married, we use only personal income when calculating their FPL percentage. For married participants, we aggregate the income of both partners. For the elderly couple or single person whose income is above 135 percent of the FPL, we assign $104.90 per month and estimate total Part B premiums paid for the duration of enrollment.

Medicare

Medicare is a federally financed health insurance plan for the elderly, persons receiving Social Security disability payments, and most persons with end-stage renal disease. Medicare has been in place since 1966 and comprises Part A and Part B. Medicare Part A, which provides hospital insurance, is automatically given to those who are eligible for Social Security. Medicare Part B provides medical insurance that pays for medical expenses and can be purchased for a monthly premium.

There are two options through which a Medicare beneficiary can get Medicare benefits:

- **Traditional Medicare:** Original Medicare is the coverage (Part A and Part B) managed by the federal government. Medicare directly pays a portion of the costs of any medical service it covers to any provider that accepts Medicare patients. Patients pay a percentage of the cost or, in some cases, a fixed amount for each covered service they receive.

- **Medicare Advantage (MA):** MA is a type of Medicare policy that allows private health insurance companies to provide Medicare Part A and Part B benefits. MA plans, often referred to as Medicare Part C, cover all Medicare services (both Part A and Part B) and may include more services or benefits for additional premiums. Each MA plan delivers Medicare benefits in a different way from the traditional Medicare. In other words, they can charge different out-of-pocket costs and also have different rules for how patients obtain services, including a requirement of a referral for visit to a specialist and constraints on the use of out-of-network providers.

Medicare Prescription Drug Coverage (PDP): Medicare offers prescription drug coverage (known as Part D) to beneficiaries, but does not administer the PDP benefits. Instead, the delivery of this optional drug coverage is completely privatized. Medicare contracts with private companies that are authorized to sell Medicare PDP. There are two main sources of Part D coverage:

- Stand-alone PDP plans: These are offered by private companies approved to sell prescription drug coverage only

- MA-PDP: MA often rolls prescription drug coverage into their services and offers hospital, medical, and prescription drug coverage under a single policy

Information on premiums paid for Part C and Part D is also not collected in the MEPS and thus must be imputed. For enrollees of Medicare Part C and Part D, missing premiums are derived from data from the Center for Medicare and Medicaid Services (CMS).[3] Research finds that a large majority of Medicare Advantage (MA) plan enrollees actually have Part D coverage and the MEPS respondents with MA plans often misreport their Part D coverage.[4] We address the underreporting issue in the MEPS by assigning an additional premium to those who reported Part C coverage.

Not all Part C enrollees, however, are required to pay additional premiums. According to our analysis of the CMS data, only 36 percent of MA-PDP (Medicare Advantage Prescription Drug Plan) enrollees in the city paid some amount of supplemental premiums.[5] Our analysis also reveals that New York City's elderly with MA-PDP, on average, pay substantially lower premiums than the national average; the weighted average monthly premiums for MA-PDP are estimated to be $42 for New York City enrollees and about $70 for the nation. For this reason, we randomly assign an average monthly premium of $42 until the control target – 36 percent of MEPS respondents who report Medicare Part C coverage – is met.

For those who reported Part D without Part C coverage, we estimate the geometric mean of premiums for stand-alone prescription drug plans offered to New York City seniors using the CMS data.[6] In 2015, the average premium of stand-alone prescription drug plans offered to NYC seniors was $49.34 per month. We assign this average premium to those who reported Part D coverage in the MEPS but did not report Part C coverage.

Predictive Mean Nearest Neighbor Matching Method Combined with Added Constraints

To impute out-of-pocket premiums and medical spending into ACS families, we employ a predictive mean matching method (PMM) that matches the missing value to the observed value with the closest predicted mean. It involves a regression of MOOP values on a vector of predictors in the sample of MEPS families that will donate their MOOP values. Predicted values are then computed for both MEPS donors and ACS recipient families. Finally, the donor with the closest predicted value to a particular ACS recipient is chosen and that donor's

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3 https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/MCRAdvPartDEnrolData/index.html; https://www.cms.gov/Medicare/Prescription-Drug-Coverage/PrescriptionDrugCovGenIn/index.html?redirect=/prescriptiondrugcovgenln/

4 Hill, Zuvekas, and Zodet. 2015. Validity of Reported Medicare Part D Enrollment in the Medical Expenditure Panel Survey. Medical Care Research and Review. 69(6): pp. 737-750.

5 We combine the 2015 MA landscape source file and the monthly MA enrollment data by contract, plan, state, and county for March 2015, limiting the data to MA plans with drug benefits offered in NYC. From the city-relevant contract and enrollment data, we then estimate the proportion of the city's MA enrollees with "zero-premium plans." We exclude programs of all-inclusive care for the elderly (PACE), Special PACE, Special Needs Plans, Part B Only Plans, and Employer sponsored MA plans. Using non-zero premium plans and their enrollment data, we then estimate population weighted average premiums of MA plans offered to NYC Medicare beneficiaries.

6 The PDP landscape source file contains premium data for state, contract, and plan, whereas the PDP enrollment data are provided for state, county, and contract numbers. Since these two data sets are provided at a different level, population weighted average premiums cannot be estimated. For this reason, we use the geometric mean that accounts for the volatile growth in premiums in the PDP market, as well as variation across insurance plans.

observed value is transferred to the recipient. Since this method imputes the non-observed variables in the recipient file with borrowed values from the donor file, it does a good job, in general, of reproducing the distribution of imputed values found in the donor file. Yet application of PMM is still challenging in the context of MOOP. This is because MOOP data typically feature a skewed positive distribution with a large mass of costs at zero.

To address this issue, we separately fit a two-part model for premium and medical spending. Two-part models are well known to provide flexibility in modeling mixed discrete-positive distributions by utilizing two separate equations to model the binomial and continuous components.[7] The first stage is to estimate the probability that a household incurred non-zero medical costs. Since this is a binomial component, we use a probit model. The second stage involves estimating dollar amounts of medical spending for households with positive probabilities of incurring non-zero medical costs using a generalized additive model GAM approach.

We model the premium portion of MOOP at the health insurance unit level as a function of demographic and socioeconomic characteristics of health insurance unit and coverage type,[8] including age, marital status, sex, race/ethnicity, occupation, poverty status, education, size of health insurance unit, and presence of people with functional difficulty in the family. Our binary prediction model for positive premium costs rendered incontestably accurate classification.[9] The overall rate of correct classification is estimated to be 83.51 percent, with 84.02 percent and 83.09 percent of true positive and negative groups correctly classified.

We built a model for out-of-pocket expenses on medical care services as a function of the sum of premiums paid by all members of a health insurance unit; demographic and socioeconomic characteristics of an individual including age, occupation, race/ethnicity, nativity, marital status, and education; whether a person has any functional difficulties; childbearing status; and types of health insurance coverage. A more accurate prediction model would include variables containing detailed clinical conditions and events as well as attributes of health insurance coverage, but that information is not available in the ACS. Omitting these important predictors resulted in a classification that is 74.65 percent accurate, with 83.70 percent of the true positive spending correctly classified and 59.2 percent of the true zero medical spending correctly classified.

We fit the continuous component using nonparametric techniques via a GAM model. This allows different functional forms for each independent variable. Binary variables used in the regression are included as dummy variables, while continuous

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7 Duan, Naihua, et al. "A Comparison of Alternative Models for the Demand for Medical Care." Journal of Business & Economic Statistics, Vol. 1, No. 2. 1983, pp. 115-126. Available at: http://www.jstor.org/stable/1391852

8 The reference person of a health insurance unit is usually a policyholder or person designated as the head of household or family if no adult policyholder is present in the unit. When there are multiple policyholders in the unit, we rank them in order of full-time job, total personal income, nearest blood relationship to the householder, and age. We flag the one with the highest rank as a designated reference person of the HIU.

9 The binomial regression output can be provided by the authors upon request.

ones are nonparametrically fit using smoothing spline functions.[10] The use of a natural log transformation is a common practice in the field of health economics for smoothing out skewed distributions and fitting the data better. However, this is done at the expense of prediction accuracy. Our exploratory analysis suggests that, by not using log transformations, the mean absolute prediction errors improve by about $1,100 – from $2,625.80 to $1,551.70. The regression output is summarized in Table H.1.[11]

ACS and MEPS cases are matched based on their predicted values of premiums and medical spending, conditional on both being positive. When cases are matched, the actual premium and medical spending values from the MEPS case are donated. A major drawback of the PMM method is that a donor can easily donate multiple times, which may lead to inefficiency.[12] A remedy to this issue would be to permit a single donation per donor. However, there are slightly less than half as many donor cases in the MEPS as cases in the ACS. For this reason, we use penalty weights to ensure that a single MEPS case cannot donate more than ten times.

As mentioned above, to draw imputed values from a more comparable donor in the MEPS, we implement a PMM with the added constraints of both host and donor cases being in the same imputation cells. For premium imputation, for example, we constructed allocation cells based on health insurance coverage type, presence of child in health insurance unit, and income quartiles. For medical spending, it is extremely important to preserve the relationship between health status, attributes of health insurance coverage, ages, and income. We thus use coverage type by age, any difficulty in hearing, vision, cognitive, ambulatory, or self-care, and two income subgroups – below or above 200 percent of the FPL. These matching criteria are used to better preserve the joint distribution of MOOP and important demographic characteristics, which is essential to classification accuracy of the poor. Otherwise, subsequent data analyses could suffer from match biases.[13] For example, NYCgov poverty data is often used at relatively aggregate levels classified by broad categories (e.g., poverty by age group or marginal impact of MOOP on the elderly). Thus, it is important to include such attributes as matching criteria.

Table H.2 shows the distribution of MOOP values in the MEPS, and PMM values in the ACS for 2016. The matched MOOP values for medical spending and premiums in the ACS are very similar to those in the MEPS. The percent of HIUs estimated to have zero premium expenditures differs by just 1.3 percentage points between the ACS and the MEPS. The percent of estimated zeros for per-person medical expenditures differs by 3.1 percentage points. This similarity holds when aggregated to the Poverty Unit level, with proportions of households with zero

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10 Smoothing splines are a particular type of nonparametric smoothing technique. For an overview of smoothing spline functions and GAM, see: Luke John Keele. Semiparametric Regression for the Social Sciences. West Sussex, England: John Wiley and Sons, Ltd. 2008.

11 Nonparametric variables do not have reported coefficients, but rather have smoothed bivariate plots. These plots are available from the authors upon request.

12 Morris et al. Tuning multiple Imputation by Predictive Mean Matching and Local Residual Draws. BMC Medical Research Methodology. 2014. 14:75.

13 Bollinger and Hirsch. Match Bias from Earnings Imputation in the Current Population Survey: The Case of Imperfect Matching. *Journal of Labor Economics*. 2006. Vol. 24, No. 3.

MOOP expenditures at 9.1 and 7.9 percent in the ACS and the MEPS, respectively (a difference of 1.2 percentage points). Our matching methodology – the two-part model – did a particularly good job at replicating the proportion of zero expenditures. It also uses a two-round matching process: ACS cases that are predicted to have positive spending but do not get matched in the first round of the MEPS donation undergo a second round of matching to assign them a MOOP expenditure value. The result, which we see in Table H.2, is a closely approximated MOOP distribution between the MEPS and the ACS.

A better measure of match quality is seen in the conditional distributions. By looking at the matched values conditional on matching criteria, we can see whether the medical spending patterns are reproduced in the ACS. Panel A in Table H.3 reports the mean and median medical spending in the MEPS and the ACS, per person, by type of insurance coverage and age. The mean and median values are relatively close to the MEPS data for nonelderly adults. However, notable differences are found for seniors with Medicare coverage and private coverage or Medicaid.

Panel B displays the mean and median premium estimates in the MEPS and the ACS by insurance and elderly status for all families. Like the medical spending values in Panel A, the mean and median premium estimates are very similar for all families across the ACS and the MEPS; the only exception being families with elderly present covered by private coverage or Medicaid.

Note that MEPS data provide national estimates of health care spending not specific to New York City families. New York City has a much more diversified population in terms of race and ethnicity than the nation as a whole. Our exploratory analysis (not reported here) also revealed that the city's families have higher income than MEPS families. It is not clear at this time whether imputations derived from the nationally representative data overestimate MOOP for New York City families (perhaps due to New York City's relatively generous Medicaid and Child Health Plus programs), or whether imputations underestimate medical costs (perhaps because well-insured low-income families use more medical care and, therefore, incur more related out-of-pocket medical costs). We are exploring other sources that may provide insights into differences between spending patterns of families in New York City and the nation as a whole with an eye to improving our imputation in future reports. (See Table H.3.)

Table H.4 reports the impact of MOOP on the poverty rate for the years 2005 to 2016. MOOP has a substantial impact on the poverty rate, increasing poverty throughout the city by between 2.6 and 3.6 percentage points in this time period. The impact of MOOP dropped dramatically starting in 2008. This is likely the result of the better statistical match relative to the prior time period, with more fine-grained matching criteria and a better metrics of distance function.

Table H.4 also reports the impact of MOOP on poverty among the elderly, the group most affected by medical spending. The MOOP adjustment raises elderly

poverty by a much larger amount, ranging from 3.8 percentage points to 7.5 percentage points. The impact of MOOP on the elderly led to a considerable change in the way we understand their poverty. The elderly have had a higher overall poverty rate than the city as a whole for every year from 2005 through 2016, with the exception of 2012 (where the elderly poverty rate was 20.3 percent compared to the citywide rate of 20.7 percent).

Table H.1
Regression Model to Predict Medical Out-Of-Pocket Spending, 2016

Dummy Variables	Premium		Medical Spending	
	Co-Efficient	t-Statistic	Co-Efficient	t-Statistic
(Intercept)	1,833.96	7.82	1,041.82	9.38
Type and Composition of Health Insurance Coverage*				
Nonelderly – ESI only	(Reference Group)		-129.37	-2.63
Nonelderly – Non-ESI Private only	1,391.69	11.77	-19.73	-0.34
Nonelderly – Private and Public	-582.20	-4.64	103.73	1.01
Nonelderly – Public Coverage only	-2,791.55	-12.61	-307.07	-5.52
Elderly – Medicare only	-2,327.21	-14.75	-489.26	-3.48
Elderly– Medicare and Private	-470.46	-3.44	-389.60	-2.76
Elderly – Medicare and Medicaid	-2,758.35	-5.55	-1165.17	-6.93
Elderly – Private or Medicaid	167.38	0.40	-937.73	-3.40
Size of Health Insurance Unit (Reference Group: 1-person health insurance unit)				
2	961.77	9.05	-220.26	-4.58
3	1,454.19	10.80	-367.68	-6.51
4	1,912.47	12.74	-520.66	-8.54
5	2,323.83	12.03	-445.30	-6.27
6	1,789.99	4.93	-303.50	-2.72
7	1,698.38	1.99	-573.86	-2.60
8	2,169.72	1.33	-396.75	-1.27
9	2,814.22	0.77	-	-
10	1,345.26	0.28	-	-
Race/Ethnicity (Reference Group: White)				
Non-Hispanic Black	-145.88	-1.51	-277.73	-6.79
Hispanic	-133.80	-1.24	-98.44	-2.43
Non-Hispanic Asian	-326.50	-2.19	-262.79	-4.29
Non-Hispanic Other Race	-134.80	-0.78	-199.77	-2.99

Table H.1 *(continued)*

Regression Model to Predict Medical Out-Of-Pocket Spending, 2016

Dummy Variables	Premium		Medical Spending	
	Co-Efficient	t-Statistic	Co-Efficient	t-Statistic
Occupations (Reference Group: Individuals in production and transportation occupations)				
Management, Business, and Financial Operations, or Professional Occupations	-164.86	-1.40	-47.27	-1.02
Farming, Fishing, and Frestry, or Construction and Extraction Occupations	-534.67	-4.11	-147.31	-2.68
Military	-691.52	-0.81	-	-
Service Occupations	-596.33	-4.27	-51.90	-0.99
Sales Related or Office Support Occupations	-276.44	-2.18	-154.96	-3.10
Education (Reference Group: Less than high school)				
High School or Some College	426.20	3.45	140.61	3.03
Bachelor's Degree or Higher	483.02	3.60	356.11	6.67
Married	687.41	6.67	54.85	1.20
Female	-190.51	-3.09	114.51	4.54
Nativity (Reference Group: Foreign born living in the U.S. less than 15 years)				
U.S. Born	242.38	1.44	77.45	1.15
Foreign Born living in the U.S. 15 years or more	234.87	1.34	-45.90	-0.64
Other Characteristics				
Work Full-Time	228.24	2.54	-177.01	-4.62
Pregnant	-	-	468.31	5.61
Middle Age	-	-	-126.41	-1.24
Family Income below 200 Percent of the Federal Poverty Line	-330.39	-2.58	-62.42	-1.14
Child	1,302.54	1.49	7.76	0.07
Functional Difficulty	10.06	0.14	502.17	14.40
	EDF	F-Statistic	EDF	F-Statistic
Total Income Aggregated at the Health Insurance Unit	8.28	3.55	8.40	9.08
Age	2.41	54.71	6.69	2.36
Premium Contributions	-	-	8.44	9.18

*Uninsured individuals are not included in the sample for Premium prediction. However, they are in the sample for medical spending prediction and serve as the reference group.

Source: 2015 Medical Expenditure Panel Survey inflated to 2016 prices using the CPI Medical Index.

Note: Premium was generated at HIU level and medical spending was generated at the person level.

Table H.2
Comparison of MOOP Distributions, MEPS and ACS, 2016

	Premiums Per Health Insurance Unit	Medical Spending Per Person	Premiums Per Poverty Unit	Medical Spending	Total MOOP
Panel A. 2016 MEPS (in 2016 dollars)					
Mean	$1,711	$625	$1,972	$1,101	$3,073
Aggregate (in millions)	N/A	N/A	N/A	N/A	N/A
Percentile					
1	$0	$0	$0	$0	$0
5	$0	$0	$0	$0	$0
10	$0	$0	$0	$0	$12
25	$0	$0	$0	$82	$312
50	$544	$130	$973	$411	$1,874
75	$2,539	$595	$2,806	$1,241	$4,437
90	$4,982	$1,640	$5,397	$2,842	$7,502
95	$6,850	$2,830	$7,435	$4,362	$10,130
99	$12,236	$6,667	$13,077	$9,477	$17,373
N	$2,681	$1,571	$2,824	$2,160	$3,805
Percent of Zero	44.0%	27.4%			7.9%
Panel B. 2016 ACS					
Mean	$1,499	$543	$2,094	$1,241	$3,335
Aggregate (in millions)	$7,630	$4,540	$7,430	$4,400	$11,800
Percentile					
1	$0	$0	$0	$0	$0
5	$0	$0	$0	$0	$0
10	$0	$0	$0	$3	$4
25	$0	$2	$0	$102	$277
50	$480	$125	$1,178	$483	$2,010
75	$2,159	$516	$3,076	$1,462	$4,841
90	$4,359	$1,414	$5,568	$3,334	$8,428
95	$6,065	$2,476	$7,473	$4,992	$11,220
99	$10,794	$5,715	$12,577	$9,717	$18,076
N	$2,428	$1,302	$2,872	$2,156	$4,080
Percent of Zero	45.2%	24.3%			9.1%

Sources: American Community Survey Public Use Micro Sample as augmented by NYC Opportunity, and 2015 Medical Expenditure Panel Survey (MEPS) inflated to 2016 prices using the CPI Medical Index.
Note: N/A – Not applicable due to the fact that the MEPS provides data at the U.S. level as opposed to the New York City level.

Table H.3
Comparison of MEPS and ACS MOOP Values by Age and Insurance Status, 2016

Panel A: Out-of-Pocket Medical Spending Per Person										
	Non-Elderly Individual					Elderly Individual				
	ESI Only	Non-ESI Private Only	Private and Public	Public Only	Uninsured	Medicare Only	Medcare and Private	Medicare and Medicaid	Uninsured	Private or Medicaid
MEPS										
Mean	$642	$699	$792	$193	$361	$1,235	$1,510	$329	$660	$781
Median	$197	$165	$112	$0	$10	$548	$729	$97	$47	$609
ACS										
Mean	$747	$733	$566	$108	$278	$699	$1,044	$222	$682	$810
Median	$289	$249	$75	$0	$0	$293	$523	$73	$184	$367
Panel B. Out-of-Pocket Premiums Per Health Insurance Unit										
	With No Elderly Present in Unit					With Elderly Present in Unit				
	ESI Only	Non-ESI Private Only	Private and Public	Public Only	Uninsured	Medicare Only	Medcare and Private	Medicare and Medicaid	Uninsured	Private or Medicaid
MEPS										
Mean	$2,565	$2,151	$2,322	$31	$0	$914	$3,252	$61	$0	$3,391
Median	$1,744	$212	$1,183	$0	$0	$653	$2,690	$0	$0	$2,325
ACS										
Mean	$2,416	$1,915	$2,037	$6	$0	$840	$3,125	$3	$0	$2,656
Median	$1,619	$337	$1,183	$0	$0	$596	$2,603	$0	$0	$2,304

Sources: American Community Survey Public Use Micro Sample as augmented by NYC Opportunity and 2015 Medical Expenditure panel Survey (MEPS) inflated to 2016 prices using the CPI Medical Index.
Note: Premium was generated at the HIU level and medical spending was generated at the person level.

Table H.4
Impact of Out-of-Pocket Premium Payment and Medical Spending on Poverty Rates, 2005–2016
(Numbers are Percent of the Population)

	2005*	2006*	2007*	2008	2009	2010	2011	2012	2013	2014	2015	2016**
A. All Persons												
Total NYC Opportunity Income	20.3	20.0	19.8	19.0	19.4	20.6	20.8	20.7	20.7	20.6	19.9	19.5
Net of Total MOOP	16.9	16.4	16.1	15.9	16.1	17.8	18.1	18.1	18.0	18.0	17.1	16.6
Net of Medical Spending	N/A	N/A	N/A	17.3	17.8	19.3	19.4	19.4	19.3	19.3	18.7	18.1
Net of Premium Contributions	N/A	N/A	N/A	17.4	17.4	19.0	19.4	19.3	19.3	19.0	18.0	17.7
Marginal Effects of MOOP	3.5	3.6	3.6	3.1	3.3	2.8	2.6	2.6	2.7	2.6	2.8	2.9
Marginal Effect of Medical Spending	N/A	N/A	N/A	1.7	1.6	1.3	1.3	1.3	1.4	1.2	1.2	1.3
Marginal Effect of Premium Contributions	N/A	N/A	N/A	1.7	1.9	1.6	1.4	1.4	1.4	1.6	1.9	1.7
B. Elderly Individuals												
Total NYC Opportunity Income	24.7	23.5	22.9	22.9	23.1	21.4	21.9	20.3	21.5	20.8	21.6	20.8
Net of Total MOOP	17.2	16.7	16.5	17.0	17.3	16.2	17.2	16.4	16.9	16.5	17.1	16.4
Net of Medical Spending	N/A	N/A	N/A	19.5	20.3	19.0	19.4	18.5	19.3	18.6	19.5	18.9
Net of Premium Contributions	N/A	N/A	N/A	20.0	19.4	18.9	19.3	18.2	18.8	18.4	18.8	18.1
Marginal Effects of MOOP	7.5	6.8	6.4	5.9	5.8	5.2	4.7	3.8	4.5	4.2	4.5	4.4
Marginal Effect of Medical Spending	N/A	N/A	N/A	3.4	2.8	2.5	2.4	1.8	2.2	2.2	2.1	1.9
Marginal Effect of Premium Contributions	N/A	N/A	N/A	2.9	3.6	2.5	2.6	2.0	2.7	2.4	2.8	2.7

Source: American Community Survey Public Use Micro Sample as augmented by NYC Opportunity and 2015 Medical Expenditure Survey (MEPS) inflated to 2016 prices using the CPI Medical Index.

*For the years 2005–2007, we do not disaggregate the premium portion from other medical spending. This is because type of health insurance coverage has a pivotal role in our improved methodology but is not avilable in the ACS for those years. Thus, we use a method that we utilized for the previous years' poverty reports. This creates a major break in our data series. For a more detailed description of 2005-2007 MOOP methodology, please refer to reports released in those years.

**Medical care out-of-pocket spending in 2016 is based on 2015 data. The 2016 MEPS data has not been made available at the time of this report. We will revisit and update the estimates of MOOP for 2016 when data is available. Thus, we advise caution in using the estimates for 2016.