

New York City Government Poverty Measure 2005–2016

An Annual Report from
the Office of the Mayor

Appendix B: Deriving a Poverty Threshold for New York City



Mayor's Office of Operations
The City of New York
April 2018

NYC
Opportunity

Appendix B

Deriving a Poverty Threshold for New York City

One of the primary goals of the NYCgov poverty measure is to establish a realistic standard of need for New York City. In our first three reports, we created a poverty threshold that was based on the 1995 recommendations of the National Academy of Sciences (NAS). The Interagency Technical Working Group's (ITWG) March 2010 guidelines called for a similar, but not identical, approach to drawing the poverty line.¹ These recommendations are reflected in the Supplemental Poverty Measure (SPM) that the U.S. Census Bureau first released in November 2011.²

NYC Opportunity revised the method we use to construct a New York City-specific threshold in light of the ITWG's guidelines. Bringing our threshold into closer alignment with the SPM makes our poverty rates more commensurable with those issued by the Census Bureau. However, we have not followed the SPM in all respects. This appendix briefly describes the SPM threshold and the ways in which NYC Opportunity has followed or diverged from the SPM method. It then provides the steps we take to create our New York City-specific threshold. Because year-to-year changes in the threshold are important to understanding changes in poverty rates over time, it also compares growth in the City's NYCgov threshold with the U.S.-wide SPM and the U.S. official thresholds.

From NAS to SPM

The NAS recommended that the first step in creating the poverty threshold was to compute a nationwide threshold based on the distribution of expenditures on food, clothing, shelter, and utilities by a reference unit composed of two-adult,

¹ Observations from the Interagency Technical Working Group on Developing a Supplemental Poverty Measure. March 2010. Available at: <https://www.census.gov/library/working-papers/2010/demo/spm-working-group.html>

² Short, Kathleen. The Research Supplemental Poverty Measure: 2010. U.S. Bureau of the Census. November 2011. Available at: <https://www.census.gov/prod/2011pubs/p60-241.pdf>

two-child families. Expenditures are measured using a three-year moving average of data available in the Bureau of Labor Statistics' Consumer Expenditure Survey (CE). An additional factor is included in the base threshold to account for miscellaneous expenses, such as non-work-related travel, household supplies, and personal care products.

The NAS did not recommend a specific poverty line; instead, it suggested that the threshold fall between the 30th and 35th percentile of the distribution of what families spend on the items in the threshold. The NAS also offered an upper and lower bound for the factor that accounts for miscellaneous necessities, a multiplier ranging from 1.15 to 1.25 times the food, clothing, shelter, and utilities expenditure estimate.³

The SPM threshold is also based on this CE measure of expenditures on the same group of necessities. However, the SPM differs from the prior NAS method in four respects:

1. The SPM expands the reference family to include all Consumer Units in the CE with exactly two children, not just those with two adults.
2. The SPM is based on the 33rd percentile of the expenditure distribution, not a fixed percentage of the median of the distribution.
3. The SPM uses a five-year moving average of expenditure data. The NAS had proposed a three-year moving average.
4. The SPM creates separate thresholds to reflect differences in housing status for owners with a mortgage, owners free and clear of a mortgage, and renters. The NAS-based research had used a common threshold for these groups.⁴

Accounting for Housing Status

NYC Opportunity has adopted the first three of the changes listed above. However, we have not followed the fourth, the ITWG guidelines that call for the creation of separate thresholds by housing status. Instead, the NYCgov measure accounts for all differences in housing status on the income side of the poverty measure, applying a housing status adjustment to all households that reside in “non-market rate” housing. This includes homeowners without a mortgage, renters living in rent-regulated units, and renters who do not pay cash rent, along with renters participating in means-tested housing assistance programs.

The different approaches reflect the availability of data that describe the unique features of the New York City housing market. The SPM method has been created

³ Citro and Michael, p. 106.

⁴ The NAS report was aware of the limitations of this approach and suggested that one remedy would be to develop a separate threshold for homeowners with low or no housing costs. Citro and Michael, p. 245.

for use with the Census Bureau’s Current Population Survey (CPS). The CPS indicates whether respondents own or rent their housing. A newly added question identifies homeowners who make or do not make mortgage payments. The CPS, however, does not provide information about housing expenditures, and the survey provides little other information (such as the size or condition of the housing unit) that would make estimating these feasible. The SPM’s recourse is to create separate thresholds, by housing status, derived from the housing expenditure data available in the CE.

NYC Opportunity, by contrast, uses the American Community Survey (ACS) as its principal data set. The ACS identifies homeowners who make mortgage payments, homeowners free and clear of a mortgage, renters who pay rent, and renters who do not pay cash for their shelter. In addition, the ACS provides data on what nearly all households pay out of pocket for their shelter and utilities.⁵ The unique-to-New York City Housing and Vacancy Survey (HVS) provides us with the ability to identify households that are participating in the wide variety and far-reaching array of housing affordability programs available to renters in the city. This creates the opportunity to account for the advantages of home ownership free of a mortgage and participation in housing affordability programs on a household-by-household basis, without having to construct separate thresholds that try to capture them “on average.”

Given the wealth of data available to us, NYC Opportunity concluded that we should take advantage of it. Our income-side method for accounting for housing status is detailed in Appendix C.

Geographic Adjustment

The NAS argued that because living costs are not uniform across the United States, the poverty thresholds should be geographically adjusted. Since research indicates that the largest source of the disparity in inter-area living costs is a result of differences in housing costs, the NAS Panel recommended that only the part of the threshold that is made up of shelter and utilities expenditures should be adjusted. It further suggested that the ratio of area-specific to U.S.-wide Fair Market Rents (FMR) developed by the U.S. Department of Housing and Urban Development (HUD) could be used as the adjustment factor.⁶

Following the ITWG Guidelines, the SPM uses the ratio of median rents for two-bedroom units for its adjustment factor, but computes these from the ACS. NYC Opportunity continues to use HUD’s Fair Market Rents for two-bedroom units. The FMR ratio for New York City differs from the ACS ratio (1.53293 vs. 1.35447) in 2016 because they measure different things.⁷ Fair Market Rents are representative of

⁵ The exception is renters participating in tenant-based subsidy programs. NYC Opportunity imputes their expenditures by a statistical match with the New York City Housing and Vacancy Survey.

⁶ Citro and Michael, pp. 182-201. The NAS Panel regarded this approach as provisional, pending further research.

⁷ Both ratios are computed using a five-year moving average from their respective data sources.

recently rented units of standard quality. The rent data from the ACS covers all rental units except the very small number that lack complete plumbing and kitchen facilities. Because rent regulation is so widespread in New York City, rents at the median of the ACS distribution are not an accurate reflection of the market rate rental housing market.

This creates two inconsistencies. First, the SPM method compares a New York City median rent that is influenced by housing affordability programs against a U.S.-wide median that (because of the nationally very narrow scope of these programs) is not. The impact of rent regulation on the ACS-based rents for New York City creates a second inconsistency in that the NYCgov measure is already accounting for the effect of housing affordability programs on the income side of the poverty measure. Therefore, the NYCgov measure continues to use the FMRs to create the adjustment factor.

Table B.1 provides the steps taken in creating the NYCgov threshold for 2016. The 2016 U.S.-wide SPM threshold (before the housing adjustment) is \$25,701.⁸ Housing (shelter and utilities) makes up nearly half (49.1 percent) of this threshold. The housing portion is multiplied by the ratio of U.S. to New York City Fair Market Rents (1.53293), which comes to \$19,274. This dollar amount is added together with the (unadjusted) non-housing portion of the threshold, yielding a New York City-specific threshold of \$32,402. This NYCgov threshold is 26 percent higher than the U.S.-wide SPM threshold. The geographic adjustment implies that a New York City resident needs \$1.26 to obtain a standard of living equivalent to what \$1 would obtain, on average, across the United States.

Adjustment for Poverty Unit Size

Once a threshold for the reference family has been set, thresholds need to be calculated for families (or poverty units) of other sizes and compositions, i.e., number of children and number of adults. This study uses the three-parameter scale developed by David Betson after the release of the NAS report.⁹ The scale has been used in the Census Bureau's NAS-based poverty reports and in the new SPM.

Table B.2 provides an example of family size adjustments using Betson's scale. These are known as equivalence scales because they are used to compute the amounts of income needed by families of different types to be equivalently well off. The scales give the adjustments that are needed to convert the threshold for the reference family of two adults and two children to thresholds for other family sizes.

Table B.3 lists the resulting NYCgov poverty thresholds for a variety of families and compares them to the U.S. official thresholds for families of corresponding sizes and compositions (a full range of NYCgov thresholds are found in Table B.6). The

⁸ The Bureau of Labor Statistics does not report a pre-housing status adjustment SPM threshold. The threshold here is derived from the data provided at: <http://www.bls.gov/pir/spmhome.htm#threshold>

⁹ Betson, David. Is Everything Relative? The Role of Equivalence Scales in Poverty Measurement. University of Notre Dame. March 1996. Available at: <http://aspe.hhs.gov/poverty/papers/escale.pdf>

NYCgov thresholds are always higher than the official thresholds, but not by the same factor.

This reflects the differences between the Betson scale and the scale implicit in the U.S. official thresholds. An important difference between the scaling methods is that the official method creates a different, and lower, poverty threshold for individuals and some families with a householder who is age 65 or older. The official threshold for a single adult is \$12,486 if he or she is under 65, but \$11,511 if that person is older. The NYCgov threshold makes no distinction by age. While the NYCgov threshold for a single, nonelderly person is 1.203 times the official threshold, it is 1.305 times the official threshold for a single, elderly person.

Changes in the Poverty Thresholds Over Time

Measuring poverty is an exercise in comparing incomes to thresholds. Thus, part of understanding changes in poverty rates over time is tracking how the thresholds are changing from one year to the next. Table B.4 provides the official U.S.-wide, SPM and NYCgov reference family thresholds for 2005 through 2016. It also reports the percentage change in the thresholds from the prior year, as well as the ratio of the SPM to U.S. official, NYCgov to U.S. official, and NYCgov to SPM thresholds.

From 2005 to 2010, the SPM and NYCgov thresholds grew at a faster rate than the U.S. official threshold. From 2010 to 2011, the percentage increases in the three thresholds are quite similar. But from 2011 to 2012, the official threshold rose by 2.1 percent while the SPM threshold edged down by 0.2 percent and the NYCgov threshold grew by 0.3 percent. A similar pattern was repeated in the next year. From 2012 to 2013, the U.S. official threshold increased by 1.5 percent while the SPM inched down by 0.1 percent and the NYCgov threshold grew by 0.4 percent. Between 2013 and 2014, the three thresholds return to a similar pattern of increase with the official threshold growing by 1.6 percent, the SPM threshold increasing by 1 percent, and the NYCgov threshold growing by 1.4 percent.

The NYCgov threshold increased faster than the U.S. official threshold in 2016: 2.0 percent and 1.3 percent, respectively. While this is a large increase in the NYCgov threshold, the increases before the recession were greater. What accounts for the differences in thresholds over time?

Year-to-year changes in the U.S. official threshold are determined by the year-to-year growth in the U.S.-wide Consumer Price Index for All Urban Consumers. Annual changes in the SPM and NYCgov thresholds, however, reflect changes in five-year moving averages in consumer expenditures. The threshold is a combination of housing and non-housing expenditure, which may not move along the same trajectory in any given year.

For 2016, the SPM and NYCgov thresholds are based on household spending during the 2012 to 2016 time period. Changes in the housing and non-housing portions of

the SPM and NYCgov thresholds from 2014 to 2016 are shown in Table B.5. In this period, growth in the housing portion of the SPM threshold was compounded by growth in the non-housing component. The housing portion of the NYCgov threshold grew by \$364 in 2016, a much larger increase than the previous year. The housing portion of the threshold continues to increase at a faster rate in the NYCgov threshold than in the SPM threshold. Over time, this has resulted in the NYCgov poverty threshold growing faster than both the SPM and U.S. official thresholds.

Using the NYCgov Poverty Thresholds

As explained above, poverty thresholds vary by family size and by the number of children in the family. Table B.6 provides the NYCgov poverty threshold adjusted for a range of family sizes and types.

Table B.7 presents NYCgov near poverty thresholds for the same groups. The near poverty threshold is 150 percent of the poverty threshold. This includes all people in poverty and near-poverty.

Since our first release in 2008, the NYCgov Poverty Measure has become a useful tool both inside and outside of City government. One common practice is to use the NYCgov poverty threshold as a more realistic standard of need than the U.S. official poverty threshold. We caution against this for the following reason: The NYCgov threshold is designed to be used as a standard against the NYCgov measure of income. This is the sum of all resources in our income measure: post-tax earnings (including tax credits), public assistance, social security and disability payments, unemployment income, nutritional and housing assistance, and heating assistance. The following costs are subtracted from this summed income: work-related expenses (transportation and childcare) and out-of-pocket medical expenditures. This information should be summed for all members of the extended family living in the same domicile. The NYCgov threshold should not be compared to the U.S. official threshold's income measure of only pre-tax cash.

Obviously, it is difficult if not impossible to gather this information in many situations. Instead, if the U.S. official threshold is considered inadequate and pre-tax cash is available as income data, we suggest a hybrid approach – expressing the NYCgov threshold as a percentage of the official measure and using pre-tax cash as a measure of income. This is a less than perfect solution that may suffice for establishing a parameter of need in some cases.

Table B.8 gives both the NYCgov poverty thresholds found in Table B.6 and those thresholds expressed as a percentage of the U.S. official threshold. As an example, the NYCgov threshold for the four person reference family containing two adults and two children is \$32,402, or 133 percent of the U.S. official threshold for that family. In this case, a person could be considered in need if the family's pre-tax cash income is less than 133 percent of the official threshold. This boundary should always be expressed in terms of the official, not the NYCgov, threshold.

Table B.1

Creation of NYCgov Threshold, 2016

| | |
|---------------------------------------|----------|
| U.S.-wide SPM Threshold | \$25,701 |
| Housing Portion of Threshold | 49.1% |
| Geographic Adjustment Factor | 1.53293 |
| Adjusted Housing Portion of Threshold | \$19,274 |
| NYCgov Threshold | \$32,402 |

Sources: U.S. Bureau of Labor Statistics and U.S. Department of Housing and Urban Development.
Note: See text for explanation of concept.

Table B.2

Factors Used by NYC Opportunity to Adjust Reference Family Thresholds for Units of Other Sizes and Types

| Number of Children Under 18 | | | | |
|-----------------------------|-------|-------|-------|-------|
| Number of Adults | None | One | Two | Three |
| One | 0.463 | 0.699 | 0.830 | 0.953 |
| Two | 0.653 | 0.880 | 1.000 | 1.114 |
| Three | 1.000 | 1.114 | 1.223 | 1.328 |
| Four | 1.223 | 1.328 | 1.430 | 1.529 |

Source: Computed by NYC Opportunity based on Betson, David. *Is Everything Relative? The Role of Equivalence Scales in Poverty Measurement*. University of Notre Dame. 1996.
Note: Adjustment factors are rounded.

Table B.3

Comparison of Poverty Thresholds, 2016

| Poverty Unit Composition | NYCgov | Official | Ratio NYCgov/Official |
|----------------------------|----------|----------|-----------------------|
| One Adult,* No Child | \$15,017 | \$12,486 | 1.203 |
| Two Adults,* No Child | \$21,174 | \$16,072 | 1.317 |
| One Adult,* One Child | \$22,661 | \$16,543 | 1.370 |
| One Adult, Two Children | \$26,903 | \$19,337 | 1.391 |
| One Adult, Three Children | \$30,874 | \$24,424 | 1.264 |
| Two Adults, One Child | \$28,520 | \$19,318 | 1.476 |
| Two Adults, Two Children | \$32,402 | \$24,339 | 1.331 |
| Two Adults, Three Children | \$36,094 | \$28,463 | 1.268 |

*Adult is non-elderly in official threshold.

Sources: 2016 thresholds are found at U.S. Bureau of the Census: <https://www.census.gov/data/tables/time-series/demo/income-poverty/historical-poverty-thresholds.html>

Note: NYC Opportunity calculations are from Tables B.1 and B.2.

Table B.4
Poverty Thresholds, 2005–2016

| Reference Family Thresholds | | | |
|-----------------------------------|--------------|-----------------|------------|
| Year | Official | U.S.-wide SPM | NYCgov |
| 2005 | \$19,806 | \$20,492 | \$24,532 |
| 2006 | \$20,444 | \$21,320 | \$25,615 |
| 2007 | \$21,027 | \$22,317 | \$26,979 |
| 2008 | \$21,834 | \$23,608 | \$28,822 |
| 2009 | \$21,756 | \$23,854 | \$29,265 |
| 2010 | \$22,113 | \$24,343 | \$30,055 |
| 2011 | \$22,811 | \$24,999 | \$30,945 |
| 2012 | \$23,283 | \$24,959 | \$31,039 |
| 2013 | \$23,624 | \$24,931 | \$31,156 |
| 2014 | \$24,008 | \$25,178 | \$31,581 |
| 2015 | \$24,036 | \$25,262 | \$31,756 |
| 2016 | \$24,339 | \$25,701 | \$32,402 |
| Percentage Change from Prior Year | | | |
| Year | Official | U.S.-wide SPM | NYCgov |
| 2006 | 3.2% | 4.0% | 4.4% |
| 2007 | 2.9% | 4.7% | 5.3% |
| 2008 | 3.8% | 5.8% | 6.8% |
| 2009 | -0.4% | 1.0% | 1.5% |
| 2010 | 1.6% | 2.0% | 2.7% |
| 2011 | 3.2% | 2.7% | 3.0% |
| 2012 | 2.1% | -0.2% | 0.3% |
| 2013 | 1.5% | -0.1% | 0.4% |
| 2014 | 1.6% | 1.0% | 1.4% |
| 2015 | 0.1% | 0.3% | 0.6% |
| 2016 | 1.3% | 1.7% | 2.0% |
| Ratio of Thresholds | | | |
| Year | SPM/Official | NYCgov/Official | NYCgov/SPM |
| 2005 | 103.5% | 123.9% | 119.7% |
| 2006 | 104.3% | 125.3% | 120.1% |
| 2007 | 106.1% | 128.3% | 120.9% |
| 2008 | 108.1% | 132.0% | 122.1% |
| 2009 | 109.6% | 134.5% | 122.7% |
| 2010 | 110.1% | 135.9% | 123.5% |
| 2011 | 109.6% | 135.7% | 123.8% |
| 2012 | 107.2% | 133.3% | 124.4% |
| 2013 | 105.5% | 131.9% | 125.0% |
| 2014 | 104.9% | 131.5% | 125.4% |
| 2015 | 105.1% | 132.1% | 125.7% |
| 2016 | 105.6% | 133.1% | 126.1% |

Sources: U.S. Bureau of Labor Statistics and U.S. Department of Housing and Urban Development.

Table B.5

Change in SPM and NYCgov Poverty Thresholds, 2014–2016

| U.S.-wide, SPM | Portion | | |
|------------------------------|----------------|--------------------|--------------|
| Year | Housing | Non-Housing | Total |
| 2014 | \$12,445 | \$12,733 | \$25,178 |
| 2015 | \$12,416 | \$12,846 | \$25,262 |
| 2016 | \$12,573 | \$13,128 | \$25,701 |
| Change from 2014–2015 | -\$29 | \$113 | \$84 |
| Change from 2015–2016 | \$157 | \$282 | \$439 |
| New York City, NYCgov | Portion | | |
| Year | Housing | Non-Housing | Total |
| 2014 | \$18,848 | \$12,733 | \$31,581 |
| 2015 | \$18,910 | \$12,846 | \$31,756 |
| 2016 | \$19,274 | \$13,128 | \$32,402 |
| Change from 2014–2015 | \$61 | \$113 | \$175 |
| Change from 2015–2016 | \$364 | \$282 | \$646 |

Sources: U.S. Bureau of Labor Statistics and U.S. Department of Housing and Urban Development.
 Note: Totals are computed from unrounded numbers.

Table B.6

NYCgov Poverty Thresholds by Size of Family and Number of Related Children Under 18 Years, 2016

| Size of Family Unit | Number of Children | | | | | | | |
|---------------------|--------------------|----------|----------|----------|----------|----------|----------|----------|
| | None | One | Two | Three | Four | Five | Six | Seven |
| One person | \$15,017 | | | | | | | |
| Two persons | \$21,174 | \$22,661 | | | | | | |
| Three persons | \$32,402 | \$28,520 | \$26,903 | | | | | |
| Four persons | \$39,630 | \$36,094 | \$32,402 | \$30,874 | | | | |
| Five persons | \$46,330 | \$43,036 | \$39,630 | \$36,094 | \$34,638 | | | |
| Six persons | \$52,637 | \$49,527 | \$46,330 | \$43,036 | \$39,630 | \$38,233 | | |
| Seven persons | \$58,635 | \$55,671 | \$52,637 | \$49,527 | \$46,330 | \$43,036 | \$41,688 | |
| Eight persons | \$64,380 | \$61,536 | \$58,635 | \$55,671 | \$52,637 | \$49,527 | \$46,330 | \$45,025 |

Sources: U.S. Bureau of the Census and NYC Opportunity calculations from Tables B.1 and B.2.

Table B.7

NYCgov Near Poverty Thresholds, 2016

Near Poverty = 150% of NYCgov Poverty Threshold

| Size of Family Unit | Number of Children | | | | | | | |
|---------------------|--------------------|----------|----------|----------|----------|----------|----------|----------|
| | None | One | Two | Three | Four | Five | Six | Seven |
| One person | \$22,526 | | | | | | | |
| Two persons | \$31,761 | \$33,991 | | | | | | |
| Three persons | \$48,603 | \$42,780 | \$40,354 | | | | | |
| Four persons | \$59,446 | \$54,141 | \$48,603 | \$46,312 | | | | |
| Five persons | \$69,496 | \$64,555 | \$59,446 | \$54,141 | \$51,956 | | | |
| Six persons | \$78,956 | \$74,290 | \$69,496 | \$64,555 | \$59,446 | \$57,349 | | |
| Seven persons | \$87,952 | \$83,506 | \$78,956 | \$74,290 | \$69,496 | \$64,555 | \$62,533 | |
| Eight persons | \$96,570 | \$92,304 | \$87,952 | \$83,506 | \$78,956 | \$74,290 | \$69,496 | \$67,538 |

Sources: U.S. Bureau of the Census and NYC Opportunity calculations from Tables B.1 and B.2.

Table B.8

NYCgov Poverty Thresholds as a Percent of U.S. Official by Size of Family Unit and Number of Related Children Under 18 Years, 2016

| Size of Family Unit (FPL = Federal Poverty Line) | Number of Children | | | | | | | |
|---|--------------------|----------|----------|----------|----------|----------|----------|----------|
| | None | One | Two | Three | Four | Five | Six | Seven |
| One person | 15,017 | | | | | | | |
| as % of FPL | 1.20 | | | | | | | |
| Two persons | \$21,174 | \$22,661 | | | | | | |
| as % of FPL | 1.32 | 1.37 | | | | | | |
| Three persons | \$32,402 | \$28,520 | \$26,903 | | | | | |
| as % of FPL | 1.73 | 1.48 | 1.39 | | | | | |
| Four persons | \$39,630 | \$36,094 | \$32,402 | \$30,874 | | | | |
| as % of FPL | 1.60 | 1.43 | 1.33 | 1.26 | | | | |
| Five persons | \$46,330 | \$43,036 | \$39,630 | \$36,094 | \$34,638 | | | |
| as % of FPL | 1.55 | 1.42 | 1.35 | 1.26 | 1.23 | | | |
| Six persons | \$52,637 | \$49,527 | \$46,330 | \$43,036 | \$39,630 | \$38,233 | | |
| as % of FPL | 1.53 | 1.44 | 1.37 | 1.30 | 1.24 | 1.21 | | |
| Seven persons | \$58,635 | \$55,671 | \$52,637 | \$49,527 | \$46,330 | \$43,036 | \$41,688 | |
| as % of FPL | 1.48 | 1.40 | 1.35 | 1.29 | 1.25 | 1.20 | 1.21 | |
| Eight persons | \$64,380 | \$61,536 | \$58,635 | \$55,671 | \$52,637 | \$49,527 | \$46,330 | \$45,025 |
| as % of FPL | 1.46 | 1.38 | 1.34 | 1.29 | 1.25 | 1.21 | 1.17 | 1.15 |

Sources: U.S. Bureau of the Census and NYC Opportunity calculations from Tables B.1 and B.2.