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Geographic Variation in the Cost of Living: Implications for the Poverty Guidelines and Program Eligibility Appendix A–C

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May 2013

Prepared for the Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation (DHHS/ASPE) under Order Number HHSP23337031T and Contract Number HHSP23320095654WC.

The authors wish to thank Linda Giannarelli, Paul Johnson, Kye Lippold, Michael Martinez-Schiferl, Sarah Minton, Dean Resnick, and Keith Watson for their contributions to the analyses. The authors also thank Matthew Buettgens, the designer of HIPSM, who oversaw the approach to simulating the Affordable Care Act provisions.

Appendix A

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Appendix A
Adjustments to the Guidelines

Four sets of geographic adjustments were used to produce the estimates in this paper: MSA- and state-level adjustments based on the Census Bureau's geographic adjustment to the Supplemental Poverty Measure (SPM), and MSA- and state-level adjustments based on the Regional Price Parities (RPPs) produced by the Bureau of Economic Analysis. With the exception of the state RPPs, certain adjustments were required to the indices prior to their use in this study: we scaled the SPM adjustment to apply to the portion of the guideline assumed to reflect housing costs, calculated state-level SPM adjustments for the states and Puerto Rico following the Census Bureau's MSA-based approach, and created population-weighted RPPs to adjust the guidelines for people living in MSAs that are not separately identifiable in the public use CPS ASEC. Below, we provide additional details about the adjustments.

MSA-Level SPM Adjustments

The Census Bureau produces SPM adjustments for each separately identifiable MSA in the public use CPS ASEC data, a state-level adjustment for MSAs that are not separately identifiable, and a state-level adjustment for nonmetropolitan areas (Renwick 2011). The Census Bureau SPM adjustments for this study were developed using five years of rental data from the 2005 to 2009 American Community Survey (ACS) and reflect variation in the median gross rent for a two-bedroom unit with a kitchen and full plumbing. Because the adjustments only capture variation in rental costs (and not the costs of other goods and services), the Census Bureau applies them to the share of the SPM threshold representing housing and utilities. Shares vary by whether the household owns with a mortgage, owns without a mortgage, or rents, and are calculated by the Bureau of Labor Statistics during the creation of each year's SPM threshold (Short and Garner 2012).

Poverty guidelines are based on the official poverty threshold and do not have a designated housing portion. We asked the expert panel assembled for this project whether SPM adjustments should be applied to the full guideline, or to some portion assumed to reflect housing costs. Panel members broadly agreed that adjustments should be made to a share of the poverty guideline assumed to reflect housing costs. Upon further consultation with the ASPE project officer, we chose

the housing share of the SPM threshold for renters to represent the housing share of the poverty guideline for the estimates produced here. We used the most recent available housing share estimates from the Bureau of Labor Statistics for 2008 (49.0 percent) and 2009 (49.4 percent) (Short and Garner 2012), calculating an average share of 49.2 percent for use with the 2008 and 2009 data used for this analysis.

There are four states where CPS ASEC confidentiality concerns cause metropolitan/nonmetropolitan status to be suppressed for some households. In these states, households are either classified as metropolitan or not identifiable. Twelve percent of households in Colorado, 16 percent in Louisiana, 11 percent in Nevada, and 23 percent in Utah are classified as not identifiable in the calendar year 2009 CPS ASEC data, with similar percentages for calendar year 2008. For these households, we use the state's non-metropolitan area adjustment.

Table A-1 shows the Census Bureau's SPM geographic adjustments used to adjust the housing portion of the SPM threshold—the index calculated by dividing each area's median two-bedroom rent by the national median—and the guideline adjustments calculated for this analysis.[1] We calculated the guideline adjustment by multiplying the index based on median rents by 0.492 (the housing portion of the SPM threshold for renters) and adding 0.508. The adjustments range from a low of 0.7912 in nonmetropolitan North Dakota to a high of 1.3966 in nonmetropolitan Massachusetts (with the exception of the high-cost areas of Nantucket and Martha's Vineyard, most of Massachusetts falls within areas designated as metropolitan).[2] The next highest adjustment (1.352) is for the metropolitan area covering San-Jose, Sunnyvale, and Santa Clara California.

[1] Metropolitan area boundaries and codes can change over time, and three metropolitan areas in table A-1 are identified by earlier codes in the CPS ASEC data used for this analysis. We assign the 14600 Bradenton-Sarasota-Venice adjustment shown in table A-1 to 42260 Sarasota-Bradenton-Venice, the 22520 Florence, Muscle Shoals adjustment to 22460 Florence, AL, and the 42680 Sebastian-Vero Beach adjustment to 46940 Vero Beach.

[2] A map showing metropolitan and non-metropolitan areas is available on the Census Bureau's web site at http://www.census.gov/geo/www/maps/msa_maps2009/msa2009_previews_html/cbsa_us_wall_1209.html.

Table A1. MSA-Level SPM Adjustments

		Index based on median rents	Guideline adjustment[a]
1001	ALABAMA Metro	0.71951	0.86200
1002	ALABAMA Nonmetro	0.6073171	0.80680
2001	ALASKA Metro	1.19756	1.09720
2002	ALASKA Nonmetro	1.16585	1.08160
4001	ARIZONA Metro	0.94634	0.97360
4002	ARIZONA Nonmetro	0.77195	0.88780
5001	ARKANSAS Metro	0.70732	0.85600
5002	ARKANSAS Nonmetro	0.62195	0.81400
6001	CALIFORNIA Metro	0.94878	0.97480
6002	CALIFORNIA Nonmetro	1.01829	1.00900
8001	COLORADO Metro	0.84146	0.92200
8002	COLORADO Nonmetro	0.90732	0.95440
9001	CONNECTICUT Metro	1.18659	1.09180
9002	CONNECTICUT Nonmetro	1.04878	1.02400
10002	DELAWARE Nonmetro	0.9439	0.97240
10420	Akron, OH Metropolitan Statistical Area	0.91341	0.95740
10500	Albany, GA Metropolitan Statistical Area	0.68415	0.84460
10580	Albany-Schenectady-Troy, NY Metropolitan Statistical Area	1.04146	1.02040
10740	Albuquerque, NM Metropolitan Statistical Area	0.88049	0.94120
10900	Allentown-Bethlehem-Easton, PA-NJ Metropolitan Statistical Area	1.04024	1.01980
11020	Altoona, PA Metropolitan Statistical Area	0.67195	0.83860
11100	Amarillo, TX Metropolitan Statistical Area	0.82195	0.91240
11300	Anderson, IN Metropolitan Statistical Area	0.79268	0.89800
11340	Anderson, SC Metropolitan Statistical Area	0.69634	0.85060
11460	Ann Arbor, MI Metropolitan Statistical Area	1.09512	1.04680
11500	Anniston-Oxford, AL Metropolitan Statistical Area	0.69146	0.84820
11540	Appleton, WI Metropolitan Statistical Area	0.81463	0.90880
11700	Asheville, NC Metropolitan Statistical Area	0.84024	0.92140
12001	FLORIDA Metro	1.09878	1.04860
12002	FLORIDA Nonmetro	0.80366	0.90340
12020	Athens-Clarke County, GA Metropolitan Statistical Area	0.86098	0.93160
12060	Atlanta-Sandy Springs-Marietta, GA Metropolitan Statistical Area	1.06829	1.03360
12100	Atlantic City-Hammonton, NJ Metropolitan Statistical Area	1.23171	1.11400
12260	Augusta-Richmond County, GA-SC Metropolitan Statistical Area	0.78415	0.89380
12420	Austin-Round Rock, TX Metropolitan Statistical Area	1.11829	1.05820
12540	Bakersfield, CA Metropolitan Statistical Area	0.88537	0.94360
12580	Baltimore-Towson, MD Metropolitan Statistical Area	1.23293	1.11460
12940	Baton Rouge, LA Metropolitan Statistical Area	0.87439	0.93820
13001	GEORGIA Metro	0.8122	0.90760
13002	GEORGIA Nonmetro	0.65244	0.82900
13140	Beaumont-Port Arthur, TX Metropolitan Statistical Area	0.80854	0.90580
13380	Bellingham, WA Metropolitan Statistical Area	0.95976	0.98020
13460	Bend, OR Metropolitan Statistical Area	0.95366	0.97720
13740	Billings, MT Metropolitan Statistical Area	0.8122	0.90760
13780	Binghamton, NY Metropolitan Statistical Area	0.76098	0.88240
13820	Birmingham-Hoover, AL Metropolitan Statistical Area	0.8439	0.92320
14020	Bloomington, IN Metropolitan Statistical Area	0.85732	0.92980
14060	Bloomington-Normal, IL Metropolitan Statistical Area	0.86463	0.93340

Table A1. MSA-Level SPM Adjustments (continued)

		Index based on median rents	Guideline adjustment[a]
14260	Boise City-Nampa, ID Metropolitan Statistical Area	0.83902	0.92080
14500	Boulder, CO Metropolitan Statistical Area	1.18293	1.09000
14540	Bowling Green, KY Metropolitan Statistical Area	0.74756	0.87580
14600	Bradenton-Sarasota-Venice, FL Metropolitan Statistical Area	1.16829	1.08280
14740	Bremerton-Silverdale, WA Metropolitan Statistical Area	1.04329	1.02130
15002	HAWAII Nonmetro	1.42561	1.20940
15180	Brownsville-Harlingen, TX Metropolitan Statistical Area	0.70976	0.85720
15380	Buffalo-Niagara Falls, NY Metropolitan Statistical Area	0.82439	0.91360
15940	Canton-Massillon, OH Metropolitan Statistical Area	0.7561	0.88000
15980	Cape Coral-Fort Myers, FL Metropolitan Statistical Area	1.13171	1.06480
16001	IDAHO Metro	0.7122	0.85840
16002	IDAHO Nonmetro	0.70366	0.85420
16300	Cedar Rapids, IA Metropolitan Statistical Area	0.79634	0.89980
16580	Champaign-Urbana, IL Metropolitan Statistical Area	0.87561	0.93880
16620	Charleston, WV Metropolitan Statistical Area	0.69634	0.85060
16700	Charleston-North Charleston-Summerville, SC Metropolitan Statistical Area	0.99024	0.99520
16740	Charlotte-Gastonia-Concord, NC-SC Metropolitan Statistical Area	0.92683	0.96400
16860	Chattanooga, TN-GA Metropolitan Statistical Area	0.78902	0.89620
16980	Chicago-Naperville-Joliet, IL-IN-WI Metropolitan Statistical Area	1.11951	1.05880
17001	ILLINOIS Metro	0.72927	0.86680
17002	ILLINOIS Nonmetro	0.69146	0.84820
17020	Chico, CA Metropolitan Statistical Area	1.02073	1.01020
17140	Cincinnati-Middletown, OH-KY-IN Metropolitan Statistical Area	0.87073	0.93640
17460	Cleveland-Elyria-Mentor, OH Metropolitan Statistical Area	0.89146	0.94660
17660	Coeur d'Alene, ID Metropolitan Statistical Area	0.84512	0.92380
17820	Colorado Springs, CO Metropolitan Statistical Area	0.95244	0.97660
17860	Columbia, MO Metropolitan Statistical Area	0.78902	0.89620
17900	Columbia, SC Metropolitan Statistical Area	0.8622	0.93220
17980	Columbus, GA-AL Metropolitan Statistical Area	0.80854	0.90580
18001	INDIANA Metro	0.81951	0.91120
18002	INDIANA Nonmetro	0.72683	0.86560
18140	Columbus, OH Metropolitan Statistical Area	0.93049	0.96580
18580	Corpus Christi, TX Metropolitan Statistical Area	0.97195	0.98620
19001	IOWA Metro	0.81098	0.90700
19002	IOWA Nonmetro	0.65488	0.83020
19100	Dallas-Fort Worth-Arlington, TX Metropolitan Statistical Area	1.06585	1.03240
19340	Davenport-Moline-Rock Island, IA-IL Metropolitan Statistical Area	0.78415	0.89380
19380	Dayton, OH Metropolitan Statistical Area	0.83902	0.92080
19460	Decatur, AL Metropolitan Statistical Area	0.64634	0.82600
19500	Decatur, IL Metropolitan Statistical Area	0.75	0.87700
19660	Deltona-Daytona Beach-Ormond Beach, FL Metropolitan Statistical Area	1.05122	1.02520
19740	Denver-Aurora-Broomfield, CO Metropolitan Statistical Area	1.0878	1.04320
19780	Des Moines-West Des Moines, IA Metropolitan Statistical Area	0.89146	0.94660
19820	Detroit-Warren-Livonia, MI Metropolitan Statistical Area	0.99512	0.99760
20001	KANSAS Metro	0.81829	0.91060
20002	KANSAS Nonmetro	0.67195	0.83860
20100	Dover, DE Metropolitan Statistical Area	1.03659	1.01800
20260	Duluth, MN-WI Metropolitan Statistical Area	0.85	0.92620

Table A1. MSA-Level SPM Adjustments (continued)

		Index based on median rents	Guideline Adjustment[a]
20500	Durham-Chapel Hill, NC Metropolitan Statistical Area	0.97195	0.98620
20740	Eau Claire, WI Metropolitan Statistical Area	0.79756	0.90040
20940	El Centro, CA Metropolitan Statistical Area	0.81951	0.91120
21001	KENTUCKY Metro	0.6878	0.84640
21002	KENTUCKY Nonmetro	0.60732	0.80680
21340	El Paso, TX Metropolitan Statistical Area	0.72195	0.86320
21500	Erie, PA Metropolitan Statistical Area	0.80122	0.90220
21660	Eugene-Springfield, OR Metropolitan Statistical Area	0.92439	0.96280
21780	Evansville, IN-KY Metropolitan Statistical Area	0.83415	0.91840
22001	LOUISIANA Metro	0.76341	0.88360
22002	LOUISIANA Nonmetro	0.63902	0.82240
22020	Fargo, ND-MN Metropolitan Statistical Area	0.7561	0.88000
22140	Farmington, NM Metropolitan Statistical Area	0.79512	0.89920
22180	Fayetteville, NC Metropolitan Statistical Area	0.87439	0.93820
22220	Fayetteville-Springdale-Rogers, AR-MO Metropolitan Statistical Area	0.80122	0.90220
22420	Flint, MI Metropolitan Statistical Area	0.80122	0.90220
22520	Florence-Muscle Shoals, AL Metropolitan Statistical Area	0.64756	0.82660
22660	Fort Collins-Loveland, CO Metropolitan Statistical Area	0.9378	0.96940
22900	Fort Smith, AR-OK Metropolitan Statistical Area	0.70244	0.85360
23001	MAINE Metro	0.91463	0.95800
23002	MAINE Nonmetro	0.7622	0.88300
23020	Fort Walton Beach-Crestview-Destin, FL Metropolitan Statistical Area	1.01341	1.00660
23060	Fort Wayne, IN Metropolitan Statistical Area	0.78049	0.89200
23420	Fresno, CA Metropolitan Statistical Area	0.96341	0.98200
23540	Gainesville, FL Metropolitan Statistical Area	1.01463	1.00720
24001	MARYLAND Metro	0.62805	0.81700
24002	MARYLAND Nonmetro	0.97805	0.98920
24340	Grand Rapids-Wyoming, MI Metropolitan Statistical Area	0.85122	0.92680
24540	Greeley, CO Metropolitan Statistical Area	0.85122	0.92680
24580	Green Bay, WI Metropolitan Statistical Area	0.83902	0.92080
24660	Greensboro-High Point, NC Metropolitan Statistical Area	0.81707	0.91000
24860	Greenville-Mauldin-Easley, SC Metropolitan Statistical Area	0.77927	0.89140
25001	MASSACHUSETTS Metro	0.97561	0.98800
25002	MASSACHUSETTS Nonmetro	1.8061	1.39660
25060	Gulfport-Biloxi, MS Metropolitan Statistical Area	0.96341	0.98200
25180	Hagerstown-Martinsburg, MD-WV Metropolitan Statistical Area	0.92927	0.96520
25420	Harrisburg-Carlisle, PA Metropolitan Statistical Area	0.92439	0.96280
25500	Harrisonburg, VA Metropolitan Statistical Area	0.8622	0.93220
25860	Hickory-Lenoir-Morganton, NC Metropolitan Statistical Area	0.6878	0.84640
26001	MICHIGAN Metro	0.79146	0.89740
26002	MICHIGAN Nonmetro	0.74756	0.87580
26100	Holland-Grand Haven, MI Metropolitan Statistical Area	0.86098	0.93160
26180	Honolulu, HI Metropolitan Statistical Area	1.61585	1.30300
26420	Houston-Sugar Land-Baytown, TX Metropolitan Statistical Area	1.01463	1.00720
26580	Huntington-Ashland, WV-KY-OH Metropolitan Statistical Area	0.70732	0.85600
26620	Huntsville, AL Metropolitan Statistical Area	0.74512	0.87460
26900	Indianapolis-Carmel, IN Metropolitan Statistical Area	0.91829	0.95980
26980	Iowa City, IA Metropolitan Statistical Area	0.90122	0.95140

Table A1. MSA-Level SPM Adjustments (continued)

		Index based on median rents	Guideline adjustment[a]
27001	MINNESOTA Metro	0.82073	0.91180
27002	MINNESOTA Nonmetro	0.71951	0.86200
27100	Jackson, MI Metropolitan Statistical Area	0.82195	0.91240
27140	Jackson, MS Metropolitan Statistical Area	0.9061	0.95380
27260	Jacksonville, FL Metropolitan Statistical Area	1.04146	1.02040
27340	Jacksonville, NC Metropolitan Statistical Area	0.8378	0.92020
27500	Janesville, WI Metropolitan Statistical Area	0.86463	0.93340
27740	Johnson City, TN Metropolitan Statistical Area	0.66829	0.83680
27780	Johnstown, PA Metropolitan Statistical Area	0.60732	0.80680
27900	Joplin, MO Metropolitan Statistical Area	0.72927	0.86680
28001	MISSISSIPPI Metro	0.79512	0.89920
28002	MISSISSIPPI Nonmetro	0.6378	0.82180
28020	Kalamazoo-Portage, MI Metropolitan Statistical Area	0.83293	0.91780
28100	Kankakee-Bradley, IL Metropolitan Statistical Area	0.90366	0.95260
28140	Kansas City, MO-KS Metropolitan Statistical Area	0.93415	0.96760
28660	Killeen-Temple-Fort Hood, TX Metropolitan Statistical Area	0.85366	0.92800
28700	Kingsport-Bristol-Bristol, TN-VA Metropolitan Statistical Area	0.63415	0.82000
28740	Kingston, NY Metropolitan Statistical Area	1.23293	1.11460
28940	Knoxville, TN Metropolitan Statistical Area	0.80976	0.90640
29001	MISSOURI Metro	0.7061	0.85540
29002	MISSOURI Nonmetro	0.63171	0.81880
29100	La Crosse, WI-MN Metropolitan Statistical Area	0.80244	0.90280
29180	Lafayette, LA Metropolitan Statistical Area	0.79268	0.89800
29340	Lake Charles, LA Metropolitan Statistical Area	0.7878	0.89560
29460	Lakeland-Winter Haven, FL Metropolitan Statistical Area	0.95854	0.97960
29540	Lancaster, PA Metropolitan Statistical Area	0.9561	0.97840
29620	Lansing-East Lansing, MI Metropolitan Statistical Area	0.91341	0.95740
29700	Laredo, TX Metropolitan Statistical Area	0.83171	0.91720
29740	Las Cruces, NM Metropolitan Statistical Area	0.71585	0.86020
29820	Las Vegas-Paradise, NV Metropolitan Statistical Area	1.2061	1.10140
29940	Lawrence, KS Metropolitan Statistical Area	0.89512	0.94840
30001	MONTANA Metro	0.80976	0.90640
30002	MONTANA Nonmetro	0.73171	0.86800
30020	Lawton, OK Metropolitan Statistical Area	0.74634	0.87520
30460	Lexington-Fayette, KY Metropolitan Statistical Area	0.81707	0.91000
30780	Little Rock-North Little Rock-Conway, AR Metropolitan Statistical Area	0.83293	0.91780
30980	Longview, TX Metropolitan Statistical Area	0.78293	0.89320
31001	NEBRASKA Metro	0.82073	0.91180
31002	NEBRASKA Nonmetro	0.67927	0.84220
31100	Los Angeles-Long Beach-Santa Ana, CA Metropolitan Statistical Area	1.53902	1.26520
31140	Louisville/Jefferson County, KY-IN Metropolitan Statistical Area	0.80854	0.90580
31180	Lubbock, TX Metropolitan Statistical Area	0.85976	0.93100
31340	Lynchburg, VA Metropolitan Statistical Area	0.70366	0.85420
31420	Macon, GA Metropolitan Statistical Area	0.77561	0.88960
31460	Madera-Chowchilla, CA Metropolitan Statistical Area	0.89878	0.95020
31540	Madison, WI Metropolitan Statistical Area	1.04268	1.02100
32001	NEVADA Metro	1.05244	1.02580
32002	NEVADA Nonmetro	0.92561	0.96340

Table A1. MSA Level SPM Adjustments (continued)

		Index based on median rents	Guideline adjustment[a]
32580	McAllen-Edinburg-Mission, TX Metropolitan Statistical Area	0.74268	0.87340
32780	Medford, OR Metropolitan Statistical Area	0.93293	0.96700
32820	Memphis, TN-MS-AR Metropolitan Statistical Area	0.90976	0.95560
32900	Merced, CA Metropolitan Statistical Area	0.8878	0.94480
33001	NEW HAMPSHIRE Metro	1.25366	1.12480
33002	NEW HAMPSHIRE Nonmetro	1.0939	1.04620
33100	Miami-Fort Lauderdale-Pompano Beach, FL Metropolitan Statistical Area	1.32439	1.15960
33140	Michigan City-La Porte, IN Metropolitan Statistical Area	0.81341	0.90820
33260	Midland, TX Metropolitan Statistical Area	0.94268	0.97180
33340	Milwaukee-Waukesha-West Allis, WI Metropolitan Statistical Area	0.96341	0.98200
33460	Minneapolis-St. Paul-Bloomington, MN-WI Metropolitan Statistical Area	1.11463	1.05640
33660	Mobile, AL Metropolitan Statistical Area	0.80366	0.90340
33700	Modesto, CA Metropolitan Statistical Area	1.07561	1.03720
33740	Monroe, LA Metropolitan Statistical Area	0.70732	0.85600
33780	Monroe, MI Metropolitan Statistical Area	0.87439	0.93820
33860	Montgomery, AL Metropolitan Statistical Area	0.82317	0.91300
34740	Muskegon-Norton Shores, MI Metropolitan Statistical Area	0.78537	0.89440
34820	Myrtle Beach-North Myrtle Beach-Conway, SC Metropolitan Statistical Area	0.92439	0.96280
34900	Napa, CA Metropolitan Statistical Area	1.48902	1.24060
34940	Naples-Marco Island, FL Metropolitan Statistical Area	1.25976	1.12780
34980	Nashville-Davidson-Murfreesboro-Franklin, TN Metropolitan Statistical Area	0.92073	0.96100
35002	NEW MEXICO Nonmetro	0.66951	0.83740
35380	New Orleans-Metairie-Kenner, LA Metropolitan Statistical Area	1.05244	1.02580
35620	New York-Northern New Jersey-Long Island, NY-NJ-PA Metropolitan Statistical Area	1.35366	1.17400
35660	Niles-Benton Harbor, MI Metropolitan Statistical Area	0.75122	0.87760
36001	NEW YORK Metro	0.94512	0.97300
36002	NEW YORK Nonmetro	0.79146	0.89740
36100	Ocala, FL Metropolitan Statistical Area	0.9122	0.95680
36140	Ocean City, NJ Metropolitan Statistical Area	1.16463	1.08100
36260	Ogden-Clearfield, UT Metropolitan Statistical Area	0.8622	0.93220
36420	Oklahoma City, OK Metropolitan Statistical Area	0.81341	0.90820
36500	Olympia, WA Metropolitan Statistical Area	1.02805	1.01380
36540	Omaha-Council Bluffs, NE-IA Metropolitan Statistical Area	0.90732	0.95440
36740	Orlando-Kissimmee, FL Metropolitan Statistical Area	1.16707	1.08220
36780	Oshkosh-Neenah, WI Metropolitan Statistical Area	0.78537	0.89440
37001	NORTH CAROLINA Metro	0.83171	0.91720
37002	NORTH CAROLINA Nonmetro	0.70732	0.85600
37100	Oxnard-Thousand Oaks-Ventura, CA Metropolitan Statistical Area	1.66098	1.32520
37340	Palm Bay-Melbourne-Titusville, FL Metropolitan Statistical Area	1.04024	1.01980
37460	Panama City-Lynn Haven-Panama City Beach, FL Metropolitan Statistical Area	1.00976	1.00480
37860	Pensacola-Ferry Pass-Brent, FL Metropolitan Statistical Area	0.91463	0.95800
37900	Peoria, IL Metropolitan Statistical Area	0.81707	0.91000
37980	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD Metropolitan Statistical Area	1.15732	1.07740
38001	NORTH DAKOTA Metro	0.73415	0.86920
38002	NORTH DAKOTA Nonmetro	0.57561	0.79120
38060	Phoenix-Mesa-Scottsdale, AZ Metropolitan Statistical Area	1.05	1.02460

Table A1. MSA-Level SPM Adjustments (continued)

		Index based on median rents	Guideline adjustment[a]
38300	Pittsburgh, PA Metropolitan Statistical Area	0.82195	0.91240
38900	Portland-Vancouver-Beaverton, OR-WA Metropolitan Statistical Area	0.99634	0.99820
38940	Port St. Lucie, FL Metropolitan Statistical Area	1.15	1.07380
39001	OHIO Metro	0.7	0.85240
39002	OHIO Nonmetro	0.70854	0.85660
39100	Poughkeepsie-Newburgh-Middletown, NY Metropolitan Statistical Area	1.30732	1.15120
39140	Prescott, AZ Metropolitan Statistical Area	0.9622	0.98140
39340	Provo-Orem, UT Metropolitan Statistical Area	0.83659	0.91960
39380	Pueblo, CO Metropolitan Statistical Area	0.76829	0.88600
39460	Punta Gorda, FL Metropolitan Statistical Area	1.05488	1.02700
39540	Racine, WI Metropolitan Statistical Area	0.89146	0.94660
39580	Raleigh-Cary, NC Metropolitan Statistical Area	0.99878	0.99940
39740	Reading, PA Metropolitan Statistical Area	0.93537	0.96820
39900	Reno-Sparks, NV Metropolitan Statistical Area	1.14878	1.07320
40001	OKLAHOMA Metro	0.58537	0.79600
40002	OKLAHOMA Nonmetro	0.6561	0.83080
40060	Richmond, VA Metropolitan Statistical Area	1.01707	1.00840
40140	Riverside-San Bernardino-Ontario, CA Metropolitan Statistical Area	1.24756	1.12180
40220	Roanoke, VA Metropolitan Statistical Area	0.80732	0.90520
40380	Rochester, NY Metropolitan Statistical Area	0.94512	0.97300
40420	Rockford, IL Metropolitan Statistical Area	0.85244	0.92740
40900	Sacramento-Arden-Arcade-Roseville, CA Metropolitan Statistical Area	1.19878	1.09780
40980	Saginaw-Saginaw Township North, MI Metropolitan Statistical Area	0.78902	0.89620
41001	OREGON Metro	0.90488	0.95320
41002	OREGON Nonmetro	0.78537	0.89440
41060	St. Cloud, MN Metropolitan Statistical Area	0.81463	0.90880
41180	St. Louis, MO-IL Metropolitan Statistical Area	0.91707	0.95920
41420	Salem, OR Metropolitan Statistical Area	0.8378	0.92020
41500	Salinas, CA Metropolitan Statistical Area	1.34146	1.16800
41540	Salisbury, MD Metropolitan Statistical Area	1.02683	1.01320
41620	Salt Lake City, UT Metropolitan Statistical Area	0.9622	0.98140
41700	San Antonio, TX Metropolitan Statistical Area	0.94878	0.97480
41740	San Diego-Carlsbad-San Marcos, CA Metropolitan Statistical Area	1.51098	1.25140
41860	San Francisco-Oakland-Fremont, CA Metropolitan Statistical Area	1.68049	1.33480
41940	San Jose-Sunnyvale-Santa Clara, CA Metropolitan Statistical Area	1.71585	1.35220
42001	PENNSYLVANIA Metro	0.82561	0.91420
42002	PENNSYLVANIA Nonmetro	0.69634	0.85060
42020	San Luis Obispo-Paso Robles, CA Metropolitan Statistical Area	1.3378	1.16620
42060	Santa Barbara-Santa Maria-Goleta, CA Metropolitan Statistical Area	1.60854	1.29940
42100	Santa Cruz-Watsonville, CA Metropolitan Statistical Area	1.67927	1.33420
42140	Santa Fe, NM Metropolitan Statistical Area	1.15122	1.07440
42220	Santa Rosa-Petaluma, CA Metropolitan Statistical Area	1.42439	1.20880
42340	Savannah, GA Metropolitan Statistical Area	0.98659	0.99340
42540	Scranton-Wilkes-Barre, PA Metropolitan Statistical Area	0.75488	0.87940
42660	Seattle-Tacoma-Bellevue, WA Metropolitan Statistical Area	1.18415	1.09060
42680	Sebastian-Vero Beach, FL Metropolitan Statistical Area	1.06707	1.03300
43340	Shreveport-Bossier City, LA Metropolitan Statistical Area	0.80854	0.90580
43620	Sioux Falls, SD Metropolitan Statistical Area	0.81098	0.90700
43780	South Bend-Mishawaka, IN-MI Metropolitan Statistical Area	0.87073	0.93640
43900	Spartanburg, SC Metropolitan Statistical Area	0.70976	0.85720

Table A1. MSA-Level SPM Adjustments (continued)

		Index based on median rents	Guideline adjustment[a]
44001	RHODE ISLAND Metro	1.23171	1.11400
44060	Spokane, WA Metropolitan Statistical Area	0.85122	0.92680
44100	Springfield, IL Metropolitan Statistical Area	0.81098	0.90700
44180	Springfield, MO Metropolitan Statistical Area	0.75	0.87700
44220	Springfield, OH Metropolitan Statistical Area	0.78049	0.89200
44700	Stockton, CA Metropolitan Statistical Area	1.12439	1.06120
45001	SOUTH CAROLINA Metro	0.69634	0.85060
45002	SOUTH CAROLINA Nonmetro	0.67439	0.83980
45060	Syracuse, NY Metropolitan Statistical Area	0.88171	0.94180
45220	Tallahassee, FL Metropolitan Statistical Area	1.00244	1.00120
45300	Tampa-St. Petersburg-Clearwater, FL Metropolitan Statistical Area	1.10732	1.05280
45780	Toledo, OH Metropolitan Statistical Area	0.80366	0.90340
45820	Topeka, KS Metropolitan Statistical Area	0.79268	0.89800
45940	Trenton-Ewing, NJ Metropolitan Statistical Area	1.35854	1.17640
46001	SOUTH DAKOTA Metro	0.79512	0.89920
46002	SOUTH DAKOTA Nonmetro	0.62561	0.81580
46060	Tucson, AZ Metropolitan Statistical Area	0.94512	0.97300
46140	Tulsa, OK Metropolitan Statistical Area	0.8378	0.92020
46220	Tuscaloosa, AL Metropolitan Statistical Area	0.83049	0.91660
46540	Utica-Rome, NY Metropolitan Statistical Area	0.76585	0.88480
46660	Valdosta, GA Metropolitan Statistical Area	0.77927	0.89140
46700	Vallejo-Fairfield, CA Metropolitan Statistical Area	1.34024	1.16740
47001	TENNESSEE Metro	0.7622	0.88300
47002	TENNESSEE Nonmetro	0.62927	0.81760
47020	Victoria, TX Metropolitan Statistical Area	0.84268	0.92260
47220	Vineland-Millville-Bridgeton, NJ Metropolitan Statistical Area	1.09512	1.04680
47260	Virginia Beach-Norfolk-Newport News, VA-NC Metropolitan Statistical Area	1.07439	1.03660
47300	Visalia-Porterville, CA Metropolitan Statistical Area	0.81951	0.91120
47380	Waco, TX Metropolitan Statistical Area	0.87927	0.94060
47580	Warner Robins, GA Metropolitan Statistical Area	0.89146	0.94660
47900	Washington-Arlington-Alexandria, D.C.-VA-MD-WV Metropolitan Statistical Area	1.52317	1.25740
47940	Waterloo-Cedar Falls, IA Metropolitan Statistical Area	0.75244	0.87820
48001	TEXAS Metro	0.85122	0.92680
48002	TEXAS Nonmetro	0.70732	0.85600
48140	Wausau, WI Metropolitan Statistical Area	0.78537	0.89440
48620	Wichita, KS Metropolitan Statistical Area	0.78415	0.89380
49001	UTAH Metro	0.7878	0.89560
49002	UTAH Nonmetro	0.6939	0.84940
49180	Winston-Salem, NC Metropolitan Statistical Area	0.76707	0.88540
49420	Yakima, WA Metropolitan Statistical Area	0.78293	0.89320
49620	York-Hanover, PA Metropolitan Statistical Area	0.90244	0.95200
49660	Youngstown-Warren-Boardman, OH-PA Metropolitan Statistical Area	0.72073	0.86260
50001	VERMONT Metro	0.90244	0.95200
50002	VERMONT Nonmetro	0.94024	0.97060
51001	VIRGINIA Metro	0.82927	0.91600
51002	VIRGINIA Nonmetro	0.68293	0.84400

Table A1. MSA-Level SPM Adjustments (continued)

		Index based on median rents	Guideline adjustment[a]
53001	WASHINGTON Metro	0.85732	0.92980
53002	WASHINGTON Nonmetro	0.8122	0.90760
54001	WEST VIRGINIA Metro	0.72561	0.86500
54002	WEST VIRGINIA Nonmetro	0.59756	0.80200
55001	WISCONSIN Metro	0.86707	0.93460
55002	WISCONSIN Nonmetro	0.76098	0.88240
56001	WYOMING Metro	0.7622	0.88300
56002	WYOMING Nonmetro	0.77195	0.88780
70750	Bangor, ME	0.89756	0.94960
70900	Barnstable Town, MA	1.37439	1.18420
71650	Boston-Cambridge-Quincy, MA-NH	1.46341	1.22800
71950	Bridgeport-Stamford-Norwalk, CT	1.52073	1.25620
72400	Burlington-South Burlington, VT	1.21951	1.10800
72850	Danbury, CT	1.57439	1.28260
73450	Hartford-West Hartford-East Hartford, CT	1.16951	1.08340
74500	Leominster-Fitchburg-Gardner, MA	1.01463	1.00720
75700	New Haven, CT	1.30732	1.15120
76450	Norwich-New London, CT-RI (RI portion recoded to Providence)	1.2061	1.10140
76750	Portland-South Portland, ME	1.12195	1.06000
77200	Providence-Fall River-Warwick, MA-RI	1.09268	1.04560
77350	Rochester-Dover, NH-ME (Maine portion not identified)	1.13902	1.06840
78100	Springfield, MA-CT (Connecticut portion not identified)	0.98415	0.99220
78700	Waterbury, CT	1.0939	1.04620
79600	Worcester, MA-CT (Connecticut portion not identified)	1.12805	1.06300

Sources: Renwick (July 2011) and authors' calculations.

[a]The guideline adjustment is calculated by multiplying the index based on median rents by .492 (the housing portion of the SPM threshold for renters) and adding .508.

State-Level SPM Adjustments

The Census Bureau does not produce SPM adjustments at the state level, and so we calculated a state-level SPM-like index based on median rents following the Census Bureau's MSA-level SPM methodology using data from the 2006–10 ACS and the Puerto Rico Community Survey (PRCS).[3] Although these data represent a slightly different time period than the MSA-level SPM adjustments used for this analysis (2005–09), the period is consistent with the data years underlying the RPPs. Following the Census Bureau methodology, we calculated state median rents for two-bedroom units with a kitchen and full plumbing, and divided the median for each state by the national median.[4] Households reporting zero rent were excluded from the calculations, and the medians were calculated using the household weight. As with the SPM MSA-level adjustments, we applied the adjustment factor to 49.2 percent of the poverty guideline (the housing portion of the SPM threshold for renters).

Table A2 shows the derivation of the state-level SPM guideline adjustments. State-level median rents for two-bedroom units (column 1) range from a low of $558 in West Virginia to a high of $1,290 in Hawaii. The state medians were divided by the national median ($838) to produce an SPM-like index based on median rents (column 2). We calculated the guideline adjustment by multiplying the index based on median rents by .492 (the housing portion of the SPM threshold for renters) and adding .508 (column 3). The final adjustment factors range from a low of .83561 in West Virginia to a high of 1.26537 in Hawaii. The median rent for Puerto Rico is substantially lower than in the states ($350) resulting in a 0.72 adjustment to the poverty guideline.

[3] We are grateful to Trudi Renwick of the Census Bureau for answering our questions regarding the Census Bureau's methodology.

[4] Puerto Rico is not included when calculating the national median.

Table A2. Derivation of State-Level SPM Adjustments (2006–10 ACS)

State	Median rent two-bedroom unit ($)	Index based on median rents[a]	Guideline adjustment[b]
Alabama	621	0.74105	0.87260
Alaska	989	1.18019	1.08865
Arizona	834	0.99523	0.99765
Arkansas	607	0.72434	0.86438
California	1190	1.42005	1.20666
Colorado	851	1.01551	1.00763
Connecticut	1043	1.24463	1.12036
Delaware	942	1.12411	1.06106
District of Columbia	1055	1.25895	1.12740
Florida	955	1.13962	1.06869
Georgia	777	0.92721	0.96419
Hawaii	1290	1.53938	1.26537
Idaho	648	0.77327	0.88845
Illinois	854	1.01909	1.00939
Indiana	697	0.83174	0.91722
Iowa	658	0.7852	0.89432
Kansas	681	0.81265	0.90782
Kentucky	600	0.71599	0.86027
Louisiana	713	0.85084	0.92661
Maine	760	0.90692	0.95420
Maryland	1104	1.31742	1.15617
Massachusetts	1084	1.29356	1.14443
Michigan	745	0.88902	0.94540
Minnesota	819	0.97733	0.98885
Mississippi	621	0.74105	0.87260
Missouri	681	0.81265	0.90782
Montana	631	0.75298	0.87847
Nebraska	670	0.79952	0.90136
Nevada	962	1.14797	1.07280
New Hampshire	1004	1.19809	1.09746
New Jersey	1150	1.37232	1.18318
New Mexico	683	0.81504	0.90900
New York	982	1.17184	1.08455
North Carolina	695	0.82936	0.91605
North Dakota	582	0.69451	0.84970
Ohio	699	0.83413	0.91839
Oklahoma	630	0.75179	0.87788

Table A2. Derivation of State-Level SPM Adjustments (2006–10 ACS)

State	Median rent two-bedroom unit ($)	Index based on median rents[a]	Guideline adjustment[b]
Oregon	778	0.9284	0.96477
Pennsylvania	769	0.91766	0.95949
Puerto Rico	360	0.42959	0.71936
Rhode Island	915	1.09189	1.04521
South Carolina	670	0.79952	0.90136
South Dakota	607	0.72434	0.86438
Tennessee	667	0.79594	0.89960
Texas	803	0.95823	0.97945
Utah	737	0.87947	0.94070
Vermont	900	1.07399	1.03640
Virginia	903	1.07757	1.03816
Washington	876	1.04535	1.02231
West Virginia	558	0.66587	0.83561
Wisconsin	734	0.87589	0.93894
Wyoming	650	0.77566	0.88962

Source: Authors' calculations based on the 2006–10 American Community Survey and 2006–10 Puerto Rico Community Survey.

[a] The national median rent for a two-bedroom unit with kitchen and full plumbing is $838.

[b] The guideline adjustment is calculated by multiplying the index based on median rents by .492 (the housing portion of the SPM threshold for renters) and adding .508.

MSA-Level RPPs

We use the BEA's 2006 to 2010 RPPs for the analysis (Aten, Figueroa, and Martin 2012). Because the RPPs reflect "all items," we apply them to the full poverty guideline (rather than to just the housing portion). The BEA calculates RPPs for all metropolitan areas, including those not separately identifiable in the CPS ASEC, as well as for the nonmetropolitan area of each state. For the MSA-level RPP simulations, we use the actual RPPs for MSAs identified in the public use CPS, create population-weighted average RPPs for the non-identified MSAs in each state, and use the state-level nonmetropolitan RPP to adjust the guidelines of persons living in nonmetropolitan areas. As with the MSA SPM adjustments, we also use the state nonmetropolitan adjustment for households where metropolitan/nonmetropolitan status is not identified.

Table A3 shows the BEA RPPs for metropolitan areas (including those not separately identifiable in the CPS ASEC), and table A4 shows the BEA RPPs for nonmetropolitan areas of each state. Metropolitan area RPPs range from a low of 81.0 in Danville, Illinois, to a high of 122.8 in Bridgeport-Stamford-Norwalk, Connecticut (RPPs are divided by 100 prior to multiplying by the poverty guideline). State nonmetropolitan RPPs range from a low of 82.0 in South Dakota to a high of 104.9 in Hawaii.

Approximately 9.6 million people in each year's CPS ASEC data are identified as living in an MSA, but the name of the MSA is suppressed to preserve confidentiality. We considered using the overall state level metropolitan RPP for these households (first column of table A5), but were concerned that this would overstate the RPPs since non-identifiable MSAs are likely to be smaller and have lower prices than identifiable metropolitan areas in the same state. Instead, we calculate average RPPs for the non-identifiable MSAs, weighted by the population in each area according to data from the 2007–09 ACS.

The second through fourth columns of table A5 show the number of non-identifiable MSAs in each state (ranging from 0 to 8), the population (in thousands) living in these areas according to the 2007-09 ACS, and the weighted average RPPs. The MSAs included in the calculation include those that are not included in the CPS ASEC sample, as well as those that are sampled but not separately identified in the public-use CPS ASEC.[5] The weighted average RPPs for non-identifiable MSAs range from 81.2 in Illinois to 108.8 in New Hampshire. As expected, the weighted average RPPs for non-identifiable MSAs are generally lower than the overall state-level RPP for metropolitan areas within the state.

[5] Although the largest 150 MSAs are automatically included in the CPS ASEC, smaller MSAs are not necessarily included (U.S. Census Bureau 2002).

Table A3: RPPs by Metropolitan Area
(Including Areas Not Identified in CPS ASEC)

Metropolitan Area	RPP[a]
Abilene, TX	93.1
Akron, OH	89.6
Albany, GA	88.4
Albany-Schenectady-Troy, NY	99.8
Albuquerque, NM	95.4
Alexandria, LA	91.3
Allentown-Bethlehem-Easton, PA-NJ	100.0
Altoona, PA	91.6
Amarillo, TX	94.2
Ames, IA	88.4
Anchorage, AK	109.6
Anderson, IN	91.0
Anderson, SC	90.1
Ann Arbor, MI	102.4
Anniston-Oxford, AL	88.4
Appleton, WI	93.0
Asheville, NC	93.2
Athens-Clarke County, GA	94.0
Atlanta-Sandy Springs-Marietta, GA	99.0
Atlantic City-Hammonton, NJ	108.8
Auburn-Opelika, AL	87.7
Augusta-Richmond County, GA-SC	91.6
Austin-Round Rock-San Marcos, TX	99.4
Bakersfield-Delano, CA	95.7
Baltimore-Towson, MD	107.4
Bangor, ME	96.1
Barnstable Town, MA	103.2
Baton Rouge, LA	94.5
Battle Creek, MI	91.8
Bay City, MI	90.4
Beaumont-Port Arthur, TX	92.7
Bellingham, WA	96.5
Bend, OR	96.9
Billings, MT	93.9
Binghamton, NY	95.3
Birmingham-Hoover, AL	94.1
Bismarck, ND	91.8

Blacksburg-Christiansburg-Radford, VA	88.6
Bloomington, IN	93.4
Bloomington-Normal, IL	94.6
Boise City-Nampa, ID	93.7
Boston-Cambridge-Quincy, MA-NH	111.0
Boulder, CO	103.0
Bowling Green, KY	85.4
Bremerton-Silverdale, WA	103.1
Bridgeport-Stamford-Norwalk, CT	122.8
Brownsville-Harlingen, TX	87.7
Brunswick, GA	86.8
Buffalo-Niagara Falls, NY	95.5
Burlington, NC	93.4
Burlington-South Burlington, VT	102.2
Canton-Massillon, OH	90.5
Cape Coral-Fort Myers, FL	98.5
Cape Girardeau-Jackson, MO-IL	82.2
Carson City, NV	99.8
Casper, WY	94.0
Cedar Rapids, IA	91.2
Champaign-Urbana, IL	94.5
Charleston, WV	89.4
Charleston-North Charleston-Summerville, SC	97.2
Charlotte-Gastonia-Rock Hill, NC-SC	95.6
Charlottesville, VA	99.9
Chattanooga, TN-GA	91.7
Cheyenne, WY	93.7
Chicago-Joliet-Naperville, IL-IN-WI	106.0
Chico, CA	97.8
Cincinnati-Middletown, OH-KY-IN	94.5
Clarksville, TN-KY	91.6
Cleveland, TN	84.4
Cleveland-Elyria-Mentor, OH	90.0
Coeur d'Alene, ID	94.7
College Station-Bryan, TX	94.9
Colorado Springs, CO	96.9
Columbia, MO	93.2
Columbia, SC	94.6
Columbus, GA-AL	92.7
Columbus, IN	86.7
Columbus, OH	94.5
Corpus Christi, TX	95.7
Corvallis, OR	97.5

Crestview-Fort Walton Beach-Destin, FL	98.9
Cumberland, MD-WV	89.6
Dallas-Fort Worth-Arlington, TX	102.6
Dalton, GA	85.8
Danville, IL	81.0
Danville, VA	89.0
Davenport-Moline-Rock Island, IA-IL	92.0
Dayton, OH	92.7
Decatur, AL	89.1
Decatur, IL	91.1
Deltona-Daytona Beach-Ormond Beach, FL	97.9
Denver-Aurora-Broomfield, CO	100.4
Des Moines-West Des Moines, IA	94.5
Detroit-Warren-Livonia, MI	99.2
Dothan, AL	87.2
Dover, DE	96.6
Dubuque, IA	92.1
Duluth, MN-WI	92.0
Durham-Chapel Hill, NC	96.3
Eau Claire, WI	92.6
El Centro, CA	93.1
Elizabethtown, KY	85.0
Elkhart-Goshen, IN	93.0
Elmira, NY	95.3
El Paso, TX	90.0
Erie, PA	93.9
Eugene-Springfield, OR	95.2
Evansville, IN-KY	91.9
Fairbanks, AK	105.6
Fargo, ND-MN	92.3
Farmington, NM	93.3
Fayetteville, NC	93.6
Fayetteville-Springdale-Rogers, AR-MO	91.9
Flagstaff, AZ	99.5
Flint, MI	95.5
Florence, SC	87.9
Florence-Muscle Shoals, AL	88.1
Fond du Lac, WI	85.3
Fort Collins-Loveland, CO	97.0
Fort Smith, AR-OK	88.3
Fort Wayne, IN	92.0
Fresno, CA	96.2
Gadsden, AL	88.2

Gainesville, FL	98.5
Gainesville, GA	90.5
Glens Falls, NY	98.2
Goldsboro, NC	88.7
Grand Forks, ND-MN	92.9
Grand Junction, CO	96.3
Grand Rapids-Wyoming, MI	92.5
Great Falls, MT	91.0
Greeley, CO	95.9
Green Bay, WI	92.1
Greensboro-High Point, NC	92.5
Greenville, NC	91.9
Greenville-Mauldin-Easley, SC	92.2
Gulfport-Biloxi, MS	95.2
Hagerstown-Martinsburg, MD-WV	102.1
Hanford-Corcoran, CA	96.3
Harrisburg-Carlisle, PA	97.1
Harrisonburg, VA	91.5
Hartford-West Hartford-East Hartford, CT	101.7
Hattiesburg, MS	86.5
Hickory-Lenoir-Morganton, NC	90.5
Hinesville-Fort Stewart, GA	90.1
Holland-Grand Haven, MI	94.4
Honolulu, HI	121.1
Hot Springs, AR	87.0
Houma-Bayou Cane-Thibodaux, LA	91.8
Houston-Sugar Land-Baytown, TX	101.2
Huntington-Ashland, WV-KY-OH	88.2
Huntsville, AL	92.9
Idaho Falls, ID	93.3
Indianapolis-Carmel, IN	94.5
Iowa City, IA	95.1
Ithaca, NY	102.8
Jackson, MI	91.6
Jackson, MS	94.0
Jackson, TN	84.7
Jacksonville, FL	97.7
Jacksonville, NC	95.7
Janesville, WI	93.1
Jefferson City, MO	81.5
Johnson City, TN	88.4
Johnstown, PA	87.3
Jonesboro, AR	82.8

Joplin, MO	89.6
Kalamazoo-Portage, MI	93.2
Kankakee-Bradley, IL	99.3
Kansas City, MO-KS	92.9
Kennewick-Pasco-Richland, WA	94.4
Killeen-Temple-Fort Hood, TX	94.7
Kingsport-Bristol-Bristol, TN-VA	88.2
Kingston, NY	103.4
Knoxville, TN	92.2
Kokomo, IN	90.0
La Crosse, WI-MN	92.7
Lafayette, IN	94.0
Lafayette, LA	93.1
Lake Charles, LA	90.8
Lake Havasu City-Kingman, AZ	94.4
Lakeland-Winter Haven, FL	96.4
Lancaster, PA	98.4
Lansing-East Lansing, MI	94.9
Laredo, TX	91.9
Las Cruces, NM	92.0
Las Vegas-Paradise, NV	99.7
Lawrence, KS	95.4
Lawton, OK	92.0
Lebanon, PA	95.4
Lewiston, ID-WA	91.7
Lewiston-Auburn, ME	94.1
Lexington-Fayette, KY	93.6
Lima, OH	89.8
Lincoln, NE	93.0
Little Rock-North Little Rock-Conway, AR	93.8
Logan, UT-ID	93.0
Longview, TX	92.4
Longview, WA	94.6
Los Angeles-Long Beach-Santa Ana, CA	114.2
Louisville-Jefferson County, KY-IN	92.1
Lubbock, TX	94.7
Lynchburg, VA	91.7
Macon, GA	91.1
Madera-Chowchilla, CA	95.3
Madison, WI	97.0
Manchester-Nashua, NH	108.8
Manhattan, KS	90.1
Mankato-North Mankato, MN	87.1

Mansfield, OH	89.8
McAllen-Edinburg-Mission, TX	87.2
Medford, OR	96.0
Memphis, TN-MS-AR	94.7
Merced, CA	94.5
Miami-Fort Lauderdale-Pompano Beach, FL	105.2
Michigan City-La Porte, IN	85.5
Midland, TX	96.8
Milwaukee-Waukesha-West Allis, WI	94.7
Minneapolis-St. Paul-Bloomington, MN-WI	102.1
Missoula, MT	96.3
Mobile, AL	92.1
Modesto, CA	97.9
Monroe, LA	89.7
Monroe, MI	97.1
Montgomery, AL	93.7
Morgantown, WV	88.6
Morristown, TN	82.2
Mount Vernon-Anacortes, WA	99.5
Muncie, IN	90.9
Muskegon-Norton Shores, MI	90.2
Myrtle Beach-North Myrtle Beach-Conway, SC	95.6
Napa, CA	117.4
Naples-Marco Island, FL	101.2
Nashville-Davidson-Murfreesboro-Franklin, TN	95.5
New Haven-Milford, CT	115.8
New Orleans-Metairie-Kenner, LA	99.5
New York-Northern New Jersey-Long Island, NY-NJ-PA	119.4
Niles-Benton Harbor, MI	90.8
North Port-Bradenton-Sarasota, FL	100.3
Norwich-New London, CT	102.0
Ocala, FL	95.1
Ocean City, NJ	108.7
Odessa, TX	94.2
Ogden-Clearfield, UT	94.4
Oklahoma City, OK	93.6
Olympia, WA	103.7
Omaha-Council Bluffs, NE-IA	94.3
Orlando-Kissimmee-Sanford, FL	100.3
Oshkosh-Neenah, WI	92.9
Owensboro, KY	88.2
Oxnard-Thousand Oaks-Ventura, CA	110.6
Palm Bay-Melbourne-Titusville, FL	98.1

Palm Coast, FL	95.3
Panama City-Lynn Haven-Panama City Beach, FL	98.4
Parkersburg-Marietta-Vienna, WV-OH	89.4
Pascagoula, MS	93.9
Pensacola-Ferry Pass-Brent, FL	95.6
Peoria, IL	92.8
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	109.0
Phoenix-Mesa-Glendale, AZ	102.1
Pine Bluff, AR	88.4
Pittsburgh, PA	92.1
Pittsfield, MA	96.9
Pocatello, ID	91.3
Portland-South Portland-Biddeford, ME	100.3
Portland-Vancouver-Hillsboro, OR-WA	99.1
Port St. Lucie, FL	99.1
Poughkeepsie-Newburgh-Middletown, NY	121.1
Prescott, AZ	97.9
Providence-New Bedford-Fall River, RI-MA	100.6
Provo-Orem, UT	95.4
Pueblo, CO	91.7
Punta Gorda, FL	97.6
Racine, WI	92.8
Raleigh-Cary, NC	96.7
Rapid City, SD	91.3
Reading, PA	96.8
Redding, CA	97.1
Reno-Sparks, NV	98.9
Richmond, VA	97.6
Riverside-San Bernardino-Ontario, CA	105.4
Roanoke, VA	92.6
Rochester, MN	94.3
Rochester, NY	98.5
Rockford, IL	92.7
Rocky Mount, NC	90.2
Rome, GA	85.8
Sacramento-Arden-Arcade-Roseville, CA	100.3
Saginaw-Saginaw Township North, MI	91.6
St. Cloud, MN	93.2
St. George, UT	96.6
St. Joseph, MO-KS	89.6
St. Louis, MO-IL	89.1
Salem, OR	96.1
Salinas, CA	103.0

Salisbury, MD	92.7
Salt Lake City, UT	97.2
San Angelo, TX	93.4
San Antonio-New Braunfels, TX	95.0
San Diego-Carlsbad-San Marcos, CA	112.5
Sandusky, OH	85.3
San Francisco-Oakland-Fremont, CA	120.0
San Jose-Sunnyvale-Santa Clara, CA	120.2
San Luis Obispo-Paso Robles, CA	102.9
Santa Barbara-Santa Maria-Goleta, CA	105.0
Santa Cruz-Watsonville, CA	118.9
Santa Fe, NM	97.8
Santa Rosa-Petaluma, CA	117.1
Savannah, GA	96.7
Scranton-Wilkes-Barre, PA	92.9
Seattle-Tacoma-Bellevue, WA	106.1
Sebastian-Vero Beach, FL	94.4
Sheboygan, WI	92.3
Sherman-Denison, TX	93.9
Shreveport-Bossier City, LA	92.5
Sioux City, IA-NE-SD	90.3
Sioux Falls, SD	93.0
South Bend-Mishawaka, IN-MI	91.6
Spartanburg, SC	90.3
Spokane, WA	94.2
Springfield, IL	93.4
Springfield, MA	98.0
Springfield, MO	90.1
Springfield, OH	91.0
State College, PA	100.3
Steubenville-Weirton, OH-WV	88.0
Stockton, CA	99.2
Sumter, SC	89.9
Syracuse, NY	96.8
Tallahassee, FL	97.7
Tampa-St. Petersburg-Clearwater, FL	97.7
Terre Haute, IN	89.8
Texarkana, TX-Texarkana, AR	90.3
Toledo, OH	91.0
Topeka, KS	91.0
Trenton-Ewing, NJ	110.2
Tucson, AZ	96.1
Tulsa, OK	93.1

Tuscaloosa, AL	92.2
Tyler, TX	96.0
Utica-Rome, NY	94.5
Valdosta, GA	86.1
Vallejo-Fairfield, CA	116.0
Victoria, TX	92.4
Vineland-Millville-Bridgeton, NJ	104.8
Virginia Beach-Norfolk-Newport News, VA-NC	99.6
Visalia-Porterville, CA	94.1
Waco, TX	93.8
Warner Robins, GA	93.7
Washington-Arlington-Alexandria, D.C.-VA-MD-WV	118.6
Waterloo-Cedar Falls, IA	91.1
Wausau, WI	92.4
Wenatchee-East Wenatchee, WA	95.8
Wheeling, WV-OH	87.4
Wichita, KS	92.2
Wichita Falls, TX	93.6
Williamsport, PA	92.9
Wilmington, NC	94.4
Winchester, VA-WV	92.5
Winston-Salem, NC	92.3
Worcester, MA	105.4
Yakima, WA	93.0
York-Hanover, PA	96.5
Youngstown-Warren-Boardman, OH-PA	90.4
Yuba City, CA	96.1
Yuma, AZ	93.7

Source: Aten, Figueroa, and Martin (2012).

[a] The RPPs are the regional price parties for "all items" and divided by 100 prior to multiplying by the poverty guideline for use in the guideline simulations.

Table A4. RPPs for State Nonmetropolitan Areas

State	Regional price parities, all items[a]
Alabama	85.3
Alaska	100.2
Arizona	91.5
Arkansas	85.2
California	98.9
Colorado	97.4
Connecticut	101.6
Delaware	89.6
District of Columbia[b]	-
Florida	90.3
Georgia	86.3
Hawaii	104.9
Idaho	92.6
Illinois	83.8
Indiana	84.3
Iowa	84.0
Kansas	83.4
Kentucky	85.5
Louisiana	85.7
Maine	95.2
Maryland	92.6
Massachusetts	101.9
Michigan	85.8
Minnesota	84.5
Mississippi	84.6
Missouri	82.4
Montana	92.9
Nebraska	83.7
Nevada	96.3
New Hampshire	99.8
New Jersey[b]	-
New Mexico	90.7
New York	95.6
North Carolina	87.2
North Dakota	83.2
Ohio	84.0
Oklahoma	86.7
Oregon	94.0

Table A4. RPPs for State Nonmetropolitan Areas

State	Regional price parities, all items[a]
Pennsylvania	92.7
Rhode Island[b]	-
South Carolina	85.8
South Dakota	82.0
Tennessee	84.6
Texas	88.4
Utah	92.8
Vermont	97.9
Virginia	89.8
Washington	95.0
West Virginia	85.1
Wisconsin	85.3
Wyoming	95.8

Source: Aten, Figueroa, and Martin (2012).

[a] The RPPs are divided by 100 prior to multiplying by the poverty guideline for use in the guideline simulations.

[b] The District of Columbia, New Jersey, and Rhode Island have no nonmetropolitan portion.

Table A5. Weighted Average RPPs for MSAs Not Separately Identifiable in the CPS ASEC

State	RPPs state metropolitan portion	MSAs Not Separately Identifiable in CPS-ASEC[a]		
		Number of MSAs not separately identifiable	Population in MSAs not separately identifiable (thousands)	Weighted average RPP for MSAs not separately identifiable[b]
Alabama	92.2	3	378	87.7
Alaska	108.9	2	465	108.7
Arizona	100.5	3	517	95.4
Arkansas	91.5	4	360	86.4
California	111.4	3	493	96.5
Colorado	99.4	1	142	96.3
Connecticut	111.6	0	NA	NA
Delaware	106.3	0	NA	NA
District of Columbia	116.1	0	NA	NA
Florida	100.8	2	224	94.8
Georgia	96.8	5	588	88.0
Hawaii	120.9	0	NA	NA
Idaho	93.7	4	263	92.4
Illinois	102.9	2	101	81.2
Indiana	93.7	6	853	91.4
Iowa	92.8	3	281	90.3
Kansas	93.1	2	158	90.0
Kentucky	92.0	3	306	87.9
Louisiana	95.3	2	356	91.6
Maine	98.4	1	107	94.1
Maryland	111.8	1	73	89.6
Massachusetts	107.9	2	929	104.3
Michigan	97.2	2	244	91.2
Minnesota	100.2	3	306	92.0
Mississippi	93.3	2	295	90.4
Missouri	90.3	3	309	84.0
Montana	94.1	2	189	94.0
Nebraska	93.9	2	315	92.8
Nevada	99.5	1	55	99.8
New Hampshire	108.6	1	404	108.8
New Jersey	112.0	0	NA	NA
New Mexico	95.2	0	NA	NA
New York	116.4	3	318	98.9
North Carolina	94.4	5	931	92.4
North Dakota	92.2	2	171	92.2
Ohio	92.2	6	505	88.5

Table A5. Weighted Average RPPs for MSAs Not Separately Identifiable in the CPS ASEC

State	RPPs state metropolitan portion	MSAs Not Separately Identifiable in CPS-ASEC[a]		
		Number of MSAs not separately identifiable	Population in MSAs not separately identifiable (thousands)	Weighted average RPP for MSAs not separately identifiable[b]
Oklahoma	93.1	0	NA	NA
Oregon	98.3	1	82	97.5
Pennsylvania	99.8	3	391	96.5
Rhode Island	100.2	0	NA	NA
South Carolina	93.6	2	304	88.6
South Dakota	92.0	2	143	91.2
Tennessee	93.5	4	519	86.1
Texas	99.1	8	1,624	93.9
Utah	96.1	2	247	94.9
Vermont	101.9	0	NA	NA
Virginia	105.8	4	559	93.3
Washington	103.0	5	586	95.6
West Virginia	90.6	6	386	88.8
Wisconsin	94.8	2	214	89.1
Wyoming	93.9	2	161	93.8

Source: Authors' calculations using RPPs from Aten, Figueroa, and Martin (2012) and population data from the 2007-09 American Community Survey.

[a] The MSAs shown here include those that are not included in the CPS ASEC sample, as well as those that are sampled but not separately identified in the public-use CPS ASEC.

[b] The RPPs are divided by 100 prior to multiplying by the poverty guideline for use in the guideline simulations.

State-Level RPPs

State-level RPPs are used without modification, other than to divide by 100 prior to multiplying by the poverty guideline. The state-level RPPs range from a low of 87.2 in South Dakota to a high of 116.1 in Hawaii (table A6).

Table A6. Regional Price Parities by State

State	Regional price parities, all items[a]
Alabama	90.6
Alaska	106.1
Arizona	99.9
Arkansas	89.3
California	110.7
Colorado	99.0
Connecticut	110.5
Delaware	103.7
District of Columbia	115.5
Florida	100.0
Georgia	94.8
Hawaii	116.1
Idaho	93.5
Illinois	100.4
Indiana	92.0
Iowa	89.3
Kansas	90.4
Kentucky	89.7
Louisiana	93.1
Maine	97.3
Maryland	110.3
Massachusetts	107.4
Michigan	95.3
Minnesota	96.8
Mississippi	88.9
Missouri	88.7
Montana	93.9
Nebraska	90.2
Nevada	99.3
New Hampshire	105.6

New Jersey	111.5
New Mexico	94.1
New York	114.1
North Carolina	92.8
North Dakota	88.2
Ohio	90.9
Oklahoma	90.9
Oregon	97.5
Pennsylvania	98.7
Rhode Island	99.8
South Carolina	92.2
South Dakota	87.2
Tennessee	91.5
Texas	97.6
Utah	95.6
Vermont	99.7
Virginia	103.1
Washington	102.0
West Virginia	88.7
Wisconsin	92.6
Wyoming	95.5

Source: Aten, Figueroa, and Martin (2012).

[a] The RPPs are divided by 100 prior to multiplying by the poverty guideline for use in the guideline simulations.

Appendix B

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Demographic Data for the Insular Areas

Table B1 provides additional background information comparing demographic, income, and housing characteristics of households in the United States, Puerto Rico, and other insular areas.

Table B1. Household Characteristics: United States and Insular Areas

		Insular Areas				
	United States	**Puerto Rico**	**American Samoa**	**Guam**	**Northern Mariana Islands**	**U.S. Virgin Islands**
Total households (thousands)	113,616	1,181	10	42	16	43
Household composition (%)						
Married couple, no kids < 18	29%	28%	18%	26%	16%	20%
Married couple, kids < 18	21%	15%	49%	29%	25%	11%
Single parent, kids < 18	10%	15%	9%	15%	18%	16%
Other family household	8%	16%	15%	12%	8%	13%
Householder living alone	27%	23%	7%	15%	22%	34%
Householder with nonrelatives	6%	3%	2%	4%	11%	5%
Average household size	2.63	3.32	5.60	3.67	3.26	2.41
Household income in 2009 (%)						
Less than $10,000	8%	30%	18%	8%	25%	14%
$10,000 to $14,999	6%	13%	12%	5%	13%	7%
$15,000 to $24,999	11%	18%	21%	11%	21%	14%
$25,000 to $49,999	25%	24%	27%	27%	23%	27%
$50,000 to $99,999	30%	12%	16%	32%	14%	26%
$100,000 or more	20%	3%	5%	16%	5%	12%
Median 2009 household income	$50,221	$18,314	$23,892	$48,274	$19,958	$37,254
Mean 2009 household income	$68,914	$28,431	$34,254	$60,671	$31,463	$52,261
Percent of households with...						
Earnings	79%	61%	90%	89%	90%	81%
Social Security	28%	42%	25%	18%	8%	25%
Public assistance income [a]	3%	6%	14%	14%	12%	7%
SSI income	4%	0.3%				
Retirement income	17%	14%	14%	17%	11%	13%
Housing tenure						
Owner occupied	66%	72%	73%	50%	28%	48%
Renter occupied	34%	28%	27%	50%	72%	52%
Household characteristics[b]						
Without complete plumbing	1%	N/A	27%	11%	14%	8%
Without complete kitchen	1%	2%	24%	10%	27%	7%

Source: United States: 2009 ACS. Puerto Rico: 2009 PRCS. Other insular areas: 2010 Census DPSFs.

[a] Public assistance income includes SSI income for insular areas other than Puerto Rico, whereas SSI and public assistance fields are separately identified in the ACS and PRCS.

[b] These characteristics are percentages of occupied households for the U.S., Puerto Rico, and American Samoa, but only available as percentages of all housing units (including Affordable Care Act) in other insular areas. Plumbing figures for Puerto Rico are not released by the Census Bureau due to concerns about data quality.

Appendix C

GEOGRAPHIC VARIATION IN THE COST OF LIVING:

LITERATURE REVIEW

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The Urban Institute

Submitted to the U.S. Department of Health and Human Services,

Office of the Assistant Secretary for Planning and Evaluation

Contract Number HHSP23320095654WC

Task Order Number HHSP23337031T

Submitted on May 22, 2012

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GEOGRAPHIC VARIATION IN THE COST OF LIVING:

LITERATURE REVIEW

I. Introduction

This paper reviews the literature pertaining to geographic variation in the cost of living across the United States and its insular areas (American Samoa, the Commonwealth of Northern Mariana Islands, Guam, the Commonwealth of Puerto Rico, and the U.S. Virgin Islands). The literature review will be used as background material for assessing whether and how the poverty guidelines could be adjusted to accurately reflect differences in the cost of living; subsequently, the review will be used to assess the implications of adjusting the guidelines for eligibility and benefit levels in federal programs. This assessment is being conducted to respond to a congressional request issued as part of the Affordable Care Act (ACA), passed on March 23, 2010.[6] The specific request to Health and Human Services (HHS) is

> SEC. 1416. STUDY OF GEOGRAPHIC VARIATION IN APPLICATION OF FPL.
>
> a) IN GENERAL. The Secretary shall conduct a study to examine the feasibility and implication of adjusting the application of the federal poverty level under this subtitle (and the amendments made by this subtitle) for different geographic areas so as to reflect the variations in cost of living among different areas within the United States. If the Secretary determines that an adjustment is feasible, the study should include a methodology to make such an adjustment. Not later than January 1, 2013, the Secretary shall submit to Congress a report on such study and shall include such recommendations as the Secretary determines appropriate.
>
> (b) INCLUSION OF TERRITORIES.
>
> (1) IN GENERAL. The Secretary shall ensure that the study under subsection (a) covers the territories of the United States and that special attention is paid to the disparity that exists among poverty levels and the cost of living in such territories and to the impact of such disparity on efforts to expand health coverage and ensure health care.

While the congressional request specifies a study focused on eligibility for health care benefits, HHS extended the assessment to include two other large federal benefit programs, the

[6] Public Law 111-148, Patient Protection and Affordable Care Act.

Supplemental Nutrition Assistance Program (SNAP) and subsidies for child care through the Child Care and Development Fund (CCDF).

Income eligibility guidelines for most federal program benefits, income thresholds for determining the official poverty rate, and federal income tax parameters historically have not varied across the country. Notable exceptions include higher poverty guidelines for Alaska and Hawaii, where living costs are presumably higher than on the mainland, and federal housing assistance that determines eligibility and benefits based on variation in income levels and fair market rents (FMRs) across metropolitan and nonmetropolitan county areas. In some programs, states may set program eligibility by using the national poverty guidelines times a factor that may reflect differences in the cost of living across states as well as other factors. Program eligibility for those living in insular areas may vary from that in the contiguous states and D.C., but eligibility variation is due to particular program structures rather than some systematic understanding of differences in the cost of living.

Though national poverty guidelines are used to determine eligibility for most public benefits across the country, considerable research documents substantial geographic variation in the cost of living. Recent work on a Supplemental Poverty Measure (SPM) that accounts for variation in housing costs across metropolitan areas within states has focused new attention on how variation in costs affect economic well-being (Short 2011). A recent conference sponsored by HHS, in the Office of the Assistant Secretary for Planning and Evaluation (ASPE), brought scholars from across the country to discuss this and other possible approaches to adjusting the poverty thresholds for geographic variation in prices (Ziliak 2011). While the current SPM adjustment focuses on housing costs, other available indices document variation in the costs of market baskets of goods across the country, food, transportation, and housing plus transportation. Research on medical cost variation also documents variation in the prices of medical goods and services in different geographic areas.

While different indices have been developed to capture the geographic variation in costs, the same research documents substantial measurement difficulties. These difficulties arise from a lack of data to estimate price differences across all areas, the challenge of separating price from quality variation, and the question of how to define the market basket for estimating price differences.

Nonetheless, the documentation of price variation in goods and services across the country raises questions about whether and how such variation might be taken into account for determining eligibility for government programs. For example, SNAP, Medicaid, and the proposed health insurance subsidies under the ACA use national poverty guidelines to determine eligibility. How would eligibility and program costs vary if eligibility thresholds or benefits reflected differences in the cost of living? How would the distribution of benefits change across the country?

The first step in assessing the effects of accounting for differences in cost of living is to fully understand the currently available indices. Questions to be considered include the quality of underlying data and assumptions, breadth of coverage, and relevance to low-income populations. The review must pay attention to whether and how different measures are appropriate for program eligibility.

This summary reviews the available approaches for capturing geographic differentials in cost of living, focusing on the quality of each approach and how it might be used to adjust poverty guidelines for program eligibility. The first section briefly reviews how eligibility is determined in health care, nutrition assistance, and child care subsidy programs. The second section reviews the existing methods for measuring geographic differences in costs, including the current approach for adjusting the SPM thresholds, indices developed to represent price parities across the country, approaches that account for market baskets of goods, and indices focused solely on individual goods, including food, transportation, and health care costs. The third section compares the indices with the broadest geographic coverage showing how well they correlate with each other. The fourth section summarizes what is known about price variation in the insular areas compared with the mainland. This topic is treated separately since it has not been part of the recent developments in measuring price variation. The last section provides a short summary of the findings and implications of this review.

II. A Brief Review of Program Eligibility

More than 30 federal means-tested government programs and numerous state and local programs compare an individual's or a family's income to some share of the federal poverty level to determine income eligibility (table C1). One notable exception is that many states use some share of the state's median family income (SMI) to determine eligibility for child care subsidies. Also, the income that is compared to the poverty guidelines may vary by program. For example, the ACA will use modified adjusted gross income (MAGI) to compare against the guidelines. MAGI is adjusted gross income as defined by federal tax law plus foreign income and tax-exempt interest, calculated for the taxpayer and spouse plus dependents.

The poverty guidelines are set by HHS each year based on the official poverty thresholds. The official poverty thresholds, used by the Census Bureau to determine poverty, vary by family size and by whether there is a child in the family and whether the family head is age 65 or older. In contrast, the poverty guidelines are simplified to use just the variation by family size. The thresholds themselves contain no geographic variation, although adjustments are made to the poverty guidelines to reflect the higher cost of living in Alaska and Hawaii. The differences for Hawaii and Alaska were developed in 1970 by the Office of Economic Opportunity and based on cost-of-living pay adjustments for federal white-collar employees living in these two locations, compared with Washington, D.C. (GAO 2009a). The Census Bureau currently uses the poverty

thresholds established for the mainland for the insular areas. HHS, however, does not issue poverty guidelines for the insular areas.[7]

Programs may have other rules that indirectly capture price variation (table C1). For instance, SNAP includes deductions for child care, health, and housing to determine net income, and these deductions should reflect differences in living costs as well as other factors. However, households also must pass a gross income test that does not take into account these expenses. States may set eligibility limits for child care subsidies at a percentage of area median income.

Eligibility for subsidies under the ACA presents additional challenges when taking into account geographic price variation. States must establish health insurance exchanges, where individuals and small businesses can purchase health insurance coverage. Refundable tax credits are available to families with MAGI between 100 and 400 percent of the federal poverty level who are not eligible for Medicaid or CHIP, purchase health insurance coverage through the health insurance exchanges, and do not have an affordable offer of employer health insurance coverage or other minimum essential coverage.[8] Tax penalties are assessed on families that do not obtain health insurance coverage and are calculated as a fixed dollar amount or a percentage of MAGI. These rules demonstrate the interactions between health care costs and program eligibility. Individuals living in high health care cost areas, for example, may face higher premiums and receive higher subsidies than those in lower cost areas. Any adjustments to the poverty guidelines must carefully consider similar variation in health care costs.

[7] In cases in which a federal program using the poverty guidelines serves any of the insular areas, the federal office that administers the program is generally responsible for deciding whether to use the contiguous-states' guidelines or follow some other procedure (GAO 2009a).

[8] Employer-sponsored coverage is considered unaffordable if the employers' contribution to its costs is less than 60 percent of the actuarial value of the plan or if the premium contribution for individuals exceeds 9.5 percent of income.

Table C1. Program Eligibility Rules

Program	Target population	Filing unit	Eligibility limits	Other rules, notes
Medicaid for persons ≥ 65 and disabled	Low-income individuals	Individuals, but SSI income definition involves deeming from an ineligible spouse or a minor's parents	Some states give eligibility if income (as defined by the SSI program) is under a specified percentage of the federal poverty level (FPL). Asset limits vary from $1,500 to $5,000.	Other avenues to eligibility are based on SSI receipt or eligibility, and medically needy status; all vary by state.
Medicaid (nonelderly, under ACA)		New Medicaid and CHIP family units	States have the option to cover if modified adjusted gross income is < 138% FPL; higher limits in all states, for children and sometimes for adults. No asset limits.	For both Medicaid and CHIP under ACA: • In lieu of earned income deductions, a 5% disregard will be applied to MAGI. • States cannot lower the income eligibility limits from March 2010 until 2014 for adults and until 2019 for children.
CHIP	Persons ≤ 18 and sometimes parents		Limits are determined by state (> 250% FPL in 25 states). No asset limits.	
ACA subsidies	Individuals without an affordable employer-sponsored insurance offer and not eligible for public coverage who purchase insurance through an exchange	Tax-filing unit	Eligibility is limited to those with incomes 100–400% FPL without access to other affordable coverage.	Subsidies limit premiums to 2% of income for families < 133% FPL, increasing to 9.5% for families from 300–400% FPL.
SNAP	Low-income Individuals/families; time limited for nondisabled childless adults	All persons who purchase and prepare food together; families receiving cash aid may file separately	Gross income < 130% FPL and net income < 100%; if ≥ 60 or with a disability, net income test only. Asset limits at $2,000, $3,000 if age ≥ 60. Many states have raised the gross income limit and dropped the net income and asset tests under expanded categorical eligibility options.	Automatic eligibility if all unit members receive cash aid or services provided under TANF/ maintenance-of-effort funding. Net income is determined by deducting housing costs > 50% net income after other deductions. Health expenses are deductible for the elderly and disabled.

Program	Target population	Filing unit	Eligibility limits	Other rules, notes
CCDF (federally funded child care subsidies)	Families with children ≤ 12 (or disabled teens) and parents employed or in an approved activity	Family; definition varies across states	Eligibility limits set by states; cannot exceed 85% of state median income; many states use poverty guidelines to set limits. Asset limits in two states.	States vary in the details of approved activities; some require a minimum number of hours of work.

III. A Review of Approaches for Measuring Variability in Costs

Considerable research has been conducted over many years to understand variation in costs across geographic areas. Some of this research relates directly to poverty measurement, some to broader measures of cost variation, and some to variation in health care costs.

We summarize the results of this research, focusing primarily on indices that could be used to adjust the poverty guidelines. We include measures produced as geographic price or cost-of-living indices, as well as those that can be converted to indices by dividing the dollar amount for a particular area by the national average. We review methodologies and underlying data used to develop indices. Given the importance of capturing variation in costs faced by low-income populations, for each index we note the income characteristics of the families represented by each index.

The review depends on existing documentation plus the most current information gleaned from experts. We have contacted and received replies from scholars in government agencies including the Bureau of Economic Analysis (BEA), the Bureau of Labor Statistics (BLS), the Census Bureau, the Congressional Research Service, the Economic Research Service (ERS), the Government Accountability Office (GAO), Housing and Urban Development (HUD), Health and Human Services (HHS), and the National Academy of Sciences (NAS). We also have contacted academics currently working on the topic including David Albouy (University of Michigan), Paul Carillo (University of Virginia), Mark Levitan (Center for Economic Opportunity), and Barry Hirsch (University of Georgia). We spoke with a representative of Runzheimer International regarding its cost-of-living estimates, and we e-mailed questions to the web site address for the Housing and Transportation Index and ACCRA index.[9] We also have received advice from project advisors James Ziliak (University of Kentucky) and Steve Zuckerman (the Urban Institute).

This review begins with the poverty measures, given the interdependence between the poverty thresholds and program eligibility guidelines. Then it covers interarea price indices, the Housing and Transportation Index, HUD FMRs and median rents, family budget approaches,

[9] The Housing and Transportation Index confirmed that their data are available for purchase and invited us to submit an application to purchase the data. We have not yet received a response concerning the ACCRA index.

pay relatives and federal employee cost-of-living adjustments, median family income, and indices for the cost of food and transportation. Health care cost variation is summarized, including generalized measures of health care costs compared with other expenditures, medical care cost indices, and use of geographic adjustments in specific health care programs. Table C2 defines the indices examined, the goods included, their geographic coverage, and the data underlying them. Table C3 provides detail on the data underlying the key indices.

Ideally, an index used to adjust program guidelines for geographic variation in the cost of living would reflect the variation in the cost of living for low income families. To our knowledge, no such index currently exists. As will be described in detail in the following sections, the indices reviewed vary with respect to the families they represent: some reflect the general population, others reflect the population at upper or median income levels, and still others reflect families with enough income to sustain a modest or sufficient standard of living. Although there has been some research into developing a consumer price index (CPI) for the poor and other demographic subgroups, this research has addressed differences between poor and nonpoor families in the change in the cost of living over time rather than across geographic areas (e.g., Garner, Johnson, and Kikoski 1996; Hobjin and Lagakos 2003; Hobjin et al. 2009; McGranahan and Paulson 2006). This literature finds more variation in the cost of living over time for poor than for nonpoor families, particularly in years with greater inflation in food, energy, and housing prices, which capture a greater share of the household expenditures of the poor. However, the differences are not large and the studies conclude that the CPI does a reasonable job at measuring inflation for poor families.

Table C2. Details of Geographic Indies (Ordered Alphabetically)

ACCRA	Description	Measures differences in cost of consumer goods and services for professional and managerial households in the top income quintile. Represents households with both spouses and one child, except apartments are assumed to be couples or singles without children. Relies on chambers of commerce to collect and submit price data.
	Dates	Quarterly, some data since1968. Since late 1980s excludes rural areas. Does not claim consistency across time.
	Geographic representation	Urban areas, defined as federally designated metropolitan areas and cities in nonmetropolitan counties where the county population exceeds 50,000 and the city to be priced exceeds 35,000.
	Sample size	Based on 50,000 prices covering 60 items. 300 cities included but can vary from quarter to quarter.
	Consumption items	Prices collected on 60 items. Composite is based on six components: housing, utilities, groceries, transportation, health care, and miscellaneous goods and services.
	Limitations	Focused on top income quintile, urban areas only.
	Availability	Reports and data sold by subscription from the Council for Community and Economic Research.
BEA/BLS regional price parities (RPPs)	Description	Developed for use in adjusting BEA measures of regional income to reflect price differences across regions. Rent data are obtained from five-year ACS. Hedonic regressions are applied to CPI data to account for differences in characteristics of goods and services, such as differences in packaging, unit size, and type of outlet sold. Prices are weighted using the expenditure weights from the Consumer Expenditure Survey.
	Dates	Various experimental RPPs have been released; most recent reflect 2005–09. RPPs based on 2006–10 data were released in 2012 as prototype estimates. Beginning in 2013 RPPs will be released as official estimates.
	Geographic representation	Produced for 38 BLS index areas (used for the CPI), MSAs, and state. RPPs for non-MSA areas of each state are not available for 2005–09 but are available for 2006–10.
	Sample size	See discussion of ACS, CE, and CPI in table 3.
	Consumption items	Rents, apparel, and separate estimates for goods and services for education, food, household, medical, recreation, transportation, other. Full detail is provided at state level. At the MSA level, BEA/BLS provides the overall RPP and RPPs for goods and services.
	Limitations	Other than rents, prices are assumed not to vary within BLS index areas and prices for areas outside BLS index areas are obtained from neighboring index areas. Bettina Aten in personal correspondence (February 27, 2011) advises caution in use of RPPs for individual expenditure categories as they have not been fully reviewed and in some cases are affected by small sample sizes (e.g., no price quote for dental services in D.C. resulted in low RPP for medical services).
	Availability	Can be downloaded free from http://www.bea.gov/research/topics/price_Indices.htm.

Census Bureau SPM adjustment	Description	Based on median gross rent (rent and utilities) for two-bedroom rental units with complete kitchen and bathroom facilities, developed using the 2005–09 ACS. Used to adjust the housing portion of the supplemental poverty measure threshold. The most recent of the Census Bureau's SPM indices as described in Renwick (2011b).
	Dates	2009; SPM adjustments using other methodologies and data years are available for earlier years.
	Geographic representation	MSAs identifiable in public-use CPS data, residual metropolitan and nonmetropolitan area in each state.
	Sample size	See ACS discussion in table 3.
	Consumption items	Rent, including utilities.
	Limitations	Only captures rent and utilities.
	Availability	Available without cost.
Carillo, Early, and Olsen (CEO)	Description	A panel of price indices for housing, other goods, and all goods for all areas in the United States. This panel, developed by Paul Carrillo, Dirk Early, and Edgar Olsen (CEO), represents a composite of costs in 2000 adjusted using BLS time-series price indices to create the panel. Basic data for 2000 come from gross rent from HUD's 2000 Section 8 Customer Satisfaction Survey adjusted for neighborhood quality using census tract information. The price index for all goods other than housing is calculated from the price indices produced each quarter by ACCRA for categories of nonhousing goods (see above). BLS data are used to compute price indices for other years.
	Dates	1982–2010
	Geographic representation	All metropolitan areas and the nonmetro part of each state.
	Sample size	Housing characteristics for 2000 cover 173,000 units across United States.
	Consumption items	Housing and other categories of nonhousing goods.
	Limitations	Relies on 2000 HUD and census tract data and ACCRA data that represent spending for the top income quintile. (Authors point to studies finding that ACCRA expenditure weights have little effect on the overall price index, and they test this. However, this does not control for the fact that the underlying prices are obtained from stores where upper income families shop.)
	Availability	Available without cost.
Economic Policy Institute (EPI) family budgets	Description	Provides budget representing the annual family income required to maintain a safe and comfortable but modest standard of living for six family types. Includes the cost of each budget component for approximately the bottom 40 percent of families.
	Dates	Most recent 2007. Some costs and usage are extrapolated from older data.
	Geographic representation	521 MSAs plus 45 MSAs and HUD fair market rent areas that lie in more than 1 state, plus 1 rural area in each state (except RI or NJ), excluding territories, for a total of 614 areas.
	Sample size	Budgets for 614 areas.

	Consumption items	Rent (including utilities based on FMR), food (from USDA low cost plan), child care (from CCDF 2000 report), transportation (travel survey NHTS for miles, IRS for cents per mile), health care (employer premiums from the Medical Expenditure Panel Survey, nongroup from e-health insurance, maximum out-of-pocket costs from the Medical Expenditure Panel Survey), taxes (from Citizens for Tax Justice), other (from BLS CE bottom 40%).
	Limitations	Not all index components are updated annually; some are extrapolated.
	Availability	Data available for each category and total by geographic unit.
Fair market rents	Description	Developed for use in HUD rental assistance programs. Reflects 40th (or in some cases, 50th) percentile of gross rent plus utilities for a standard two-bedroom unit. Beginning in 2012, FMRs are based on five years of ACS data. Where sample sizes permit, data are updated using one-year ACS data. Results are adjusted to reflect recent movers and are updated using the rent and utilities CPI. State minimums may apply. Prior year FMRs relied on data drawn from the decennial census, ACS, AHS, and random digit dialing surveys.
	Dates (including future)	Annual; new FMRs go into effect on October 1 each year. Final 2012 FMRs were published in the September 30, 2011, Federal Register.
	Geographic representation	Metropolitan areas and nonmetropolitan counties. With a few exceptions (in which HUD uses a smaller area), metro areas are based on the OMB metropolitan core-based statistical area definition. FMRs (based on adjusted 2000 decennial census data) are available for Guam, Northern Marianas, American Samoa, U.S. Virgin Islands, and Puerto Rico.
	Sample size	Not indicated in documentation, but HUD uses procedures to ensure that results are reliable (for example, statewide nonmetro value is used when data for a particular nonmetro county are insufficient).
	Consumption items	Rent of standard quality two-bedroom unit, plus tenant-paid utilities (excluding telephone, cable or satellite TV, and Internet) reflecting rents of recent movers.
	Limitations	Only reflects rent and utilities of recent movers. Some areas reflect 40th percentile, others 50th (although the federal register indicates HUD publishes tables showing the 40th and 50th for all areas). State minimum rents are applied.
	Availability	Annual, free on HUD web site.
Geographic practice cost index (GPCI)	Description	The Medicare program uses the GPCI to adjust physician payments for geographic variation in the costs of practice. There are three components of the GPCI: physician, practice, and malpractice. The physician component is based on wages of professionals; the practice component on employee wages, office rents, and a uniform index for equipment, supplies, and other. The malpractice component is based on malpractice premiums. In the past, data on physician and employee wages were obtained from the 2000 Census. In the most recent update of the GPCI, the 6th, the source of data on physician and employee wages was changed to the 2006 to 2008 BLS Occupational Employment Survey data. Data on office prices are based on the HUD's FY 2010 50th percentile rents for a two-bedroom with utilities. The malpractice component is based on malpractice premiums weighted by specialty and relative value units (RVUs). These values are calculated at the

		county level and weighted by RVU to aggregate up to the payment locality level. Each component is weighted by the Medicare Economic Index. In addition, the physician component reflects only one-quarter of the cost differences relative to the national average. Payment is not made on the pure GPCI, as policy adjustments are made to create specific floors for providers located in certain areas.
	Dates	The GPCI is updated every 3 years. Most recent data are for 2012.
	Geographic representation	Each component is developed at the county level and aggregated to the 89 Medicare physician payment localities. County-level data can be aggregated to state and MSA levels.
	Sample size	Not applicable.
	Consumption items	Physician, physician office workers, housing, and malpractice insurance.
	Limitations	The GPCI represents input prices but does not account for the variation in practice patterns that occur across and within states.
	Availability	Underlying county-level data and aggregated locality data are publicly available.
H+T Affordability Index	Description	Affordability index developed by the Center for Neighborhood Technology (CNT) as a project of the Brookings Urban Markets Initiative. Housing costs come from the ACS for owners and renters; transportation costs are estimated using models that include auto ownership, auto use, and transit. Transportation data include data collected by CNT, Local Employment Dynamics, the Census Transportation Planning Package, the 2007 National Transit Database, 2007 automobile ownership data, and the 2010 decennial census. The index can be adjusted to reflect household income. Developed to understand variation in combined housing and transportation costs across neighborhoods relative to income.
	Dates	2010 includes the full set of metropolitan areas; early years tested on individual areas.
	Geographic representation	The 2010 index includes 337 metropolitan areas and also includes micropolitan areas. The index claims to cover 80 percent of population.
	Sample size	Represents regional typical households.
	Consumption	Focus of model development is on transportation costs. Housing costs reflect the median owner and renter costs from the five-year ACS.
	Limitations	Only covers metropolitan and micropolitan areas.
	Availability	Many maps and summary statistics are available over the web. A 2011 HUD news release announced a major contract to create (with the Center for Neighborhood Technology as a subcontractor) a national housing and transportation affordability index. The underlying data for the index are available for a fee.
Medicare hospital wage index	Description	The hospital wage index is used by Medicare to adjust for a portion of labor costs across hospitals reimbursed under the inpatient prospective payment system (IPPS). Average wages for four categories of labor—registered nurses; licensed practical nurses; medical technicians; and nurse aides, orderlies, and attendants—in each geographic location are weighted by the national percentage of hours worked. Data on hourly wages are obtained from the IPPS hospitals' Medicare Cost Reports Worksheet S-3 (but generally from four years prior to the index year) and a special occupational

		mix survey that occurs every three years. Adjustments are made to meet policy objectives, including add-ons for teaching and disproportionate-share hospitals, nonmetropolitan hospitals, and hospitals located on the borders of labor markets.
	Dates	Occupational mix-adjusted hospital wage indices began in 2005 and are updated annually.
	Geographic representation	Components are developed at the county level and aggregated to 444 labor markets that consist of 365 MSAs and rural parts of states. Data can be aggregated to the state and MSA levels.
	Sample size	Data are derived from Medicare cost reports from all IPPS hospitals.
	Consumption items	Hospital nursing labor
	Limitations	The hospital wage index represents input prices for only a share of labor costs. The input data reflect only the wages of hospital employees and not similar workers employed by other types of entities. Another concern is that for some areas there is only one hospital. MEDPAC has recommended using BLS Occupational Employment Survey data in the future. It also does not account for the variation in practice patterns that occur across and within states.
	Availability	Underlying MSA data are publicly available.
Milliman Medical Index (MMI)	Description	The MMI represents the costs of health care services paid for a preferred provider plan (PPO) under a typical employer health plan for a family of four with average copayments and deductibles. The MMI is available nationally and for 14 cities across the United States. In addition, the Group Health Survey (GHS) has previously been produced to make similar estimates for a standard set of benefits and population demographics. Estimates are available at the state level and the MSA level separately, in many cases, for HMOs and PPOs. Both the MMI and the GHS produce estimates that vary across areas only by utilization and payment differences. Both the MMI and the GHS are generated based on surveys of insurers.
	Dates	The MMI has been produced annually for the past 7 years; the most recent is 2011. The GHS has been produced for 2003, 2004, 2005, 2006, 2008, and 2010. There are not currently plans for conducting the GHS again.
	Geographic representation	The MMI is produced nationally and for 14 cities. The GHS is produced for each state and MSA.
	Sample size	The sample size is not stated in available documents.
	Consumption items	Health care.
	Limitations	The MMI is limited in its geographic breadth and while the GHS has geographic breadth, it is not expected to be continued on a regular basis.
	Availability	The MMI and information on the GHS can be found on the Milliman web site. The cost of obtaining the 2010 GHS data is $4,000.

Occupational pay relatives	BLS	Pay relatives are calculated for nine occupational groups based on National Compensation Survey data. Regression techniques are used to control for geographical differences in occupational composition, establishment and occupational characteristics, and dates of data collection during the year, isolating the geographic effect on wage determination.
	Dates	2004–10.
	Geographic representation	77 metropolitan areas relative to the nation and each other.
	Sample size	See discussion of the NCS in table 3.
	Consumption	Not applicable.
	Limitations	Only published for 77 metro areas. Pay relatives were terminated with the 2011 federal budget.
	Availability	Published tables are available free on BLS web site.
Self-sufficiency standard	Center for Women's Welfare and state partners	Defines amount of income necessary to meet basic needs without public subsidies and without private/informal assistance.
	Dates	Varies by state (e.g., some represent 2006, some 2008, etc.).
	Geographic representation	Available for 37 states.
	Sample size	Components drawn from different databases.
	Consumption	Housing (FMRs from HUD), child care (market cost at 75th percentile), food (USDA low cost adjusted by state using ACCRA COLA index), transportation including insurance and cost of car ownership, health care premiums from health insurance companies, medical out-of-pocket spending from the Medical Expenditure Panel Survey adjusted by region and family size, taxes calculated by state.
	Limitations	Not an annual index. Assumes all families are working adults.
	Availability	Web access. Some states have specific calculators allowing variation in assumptions.

Table C3. Data Sources Providing Information on Geographic Variation in Prices or Income

ACCRA	Description	ACCRA is used as an index on its own, as well as input to other indices. See table 2 for details about ACCRA.
American Community Survey (ACS)	Description	A survey of households and group quarters conducted by the Census Bureau.
	Dates	1-year, 3-year, and 5-year data are released every year. The 3-year and 5-year are rolling samples (e.g., a 2005–09 file, a 2006–10 file). The 2010 ACS tabular results were released in September 2011 (2010 ACS), October 2011 (2008–10), and December 2011 (2006–10). Public-use microdata sample (PUMS) files are released 1 or 2 months after public tabular results. ACS data date back to 2001 and replace the prior decennial census long-form data.
	Geographic representation	Available for states, District of Columbia, Puerto Rico (Puerto Rico Community Survey). PUMS does not include metro and urban/rural identifiers; the Integrated Public Use Microdata Series constructs these for many (not all) households based on public-use microdata area. The Census Bureau can produce tabulations on internal ACS files on varying geographies (e.g., state, city/town, census tract, metro/micro area).
	Sample size	ACS samples 3 million addresses each year, resulting in 2 million final interviews. The 2006 ACS PUMS included 1.2 million housing units, about two-thirds of the 2 million interviewed in the 2006 ACS. Data are released as 1-year, 3-year, and 5-year files.
	Consumption items	Rental and homeownership costs including rent, mortgage, taxes, insurance, utilities and fees.
	Limitations	Only covers housing related costs. Little information on housing quality (beyond complete plumbing and kitchen facilities).
	Availability	PUMS files are available free from the Census Bureau. The Minnesota Population Center produces IPUMS—a free standardized version of PUMS with additional imputations and recodes. For a fee, the Census Bureau can produce tabulations on internal files (providing greater geographic detail and full ACS sample). HUD pays the Census Bureau for FMR tabulations.
Consumer Expenditure Survey (CE)	Description	The CE consists of two surveys: the Quarterly Interview Survey and the Diary Survey that collect information on the expenditures and income of American families and individuals. The data are integrated for published reports. Their primary purpose is to update the CPI, but data are also used for other purposes (e.g., to update the USDA estimate of the cost of raising a child, the DOD cost of living adjustment for military families, and SPM poverty thresholds).
	Dates	Annual microdata files are currently available through 2010.
	Geographic representation	Representative at the national and regional levels (northeast, midwest, south, and west). Beginning in 2006, results based on two years of data are available for 18 MSAs. Public-use microdata contain state identifiers, but not all states are interviewed and some are masked; weights are designed to add up to regional, not state, totals.

	Sample size	Each year, about 7,000 consumer units are interviewed for the diary survey. Each quarter, about 7,000 consumer units participate in the quarterly interview. The samples are independent.
	Consumption items	The quarterly interview captures an estimated 95 percent of expenditures on a variety of goods and services. Nonprescription drugs, household supplies, and personal care items are excluded. The diary survey is designed to capture small expenditures but consumers are requested to report all expenses except those on overnight travel within a two-week period.
	Limitations	Not designed to show cost-of-living differences among areas. Does not measure the cost of a standard bundle of goods and services across areas; instead shows actual expenditure levels of consumer units, which can vary for a number of reasons. Relatively small sample size.
	Availability	Available for purchase.
Consumer price indices (CPI)	Description	The CPI program produces monthly data on changes in prices paid by urban consumers for a representative basket of goods and services.
	Dates	Ongoing data release; February 2012 CPI data will be released on March 16, 2012.
	Geographic representation	Reflects urban consumers (about 87% of U.S. population). Excludes rural nonmetropolitan areas, Armed Forces, and institutions. CPIs are published at national and regional levels, and for 3 major metro areas monthly, 11 additional metro areas every other month, and 13 additional metro areas semiannually.
	Sample size	Each month, BLS data collectors call thousands of retail stores, service establishments, rental units, and doctors' offices for information on prices of thousands of items (about 80,000 items are priced per month).
	Consumption items	Food, housing, apparel, transportation, medical care, recreation, education, communication, and other goods and services (excludes investment items). Includes sales and excise taxes associated with the prices of these items.
	Limitations	The CPI is not designed to show differences in prices across areas because the composition of the market basket varies across areas. Rather, it shows differences in inflation between areas. The BLS and BEA use hedonic regressions to control for differences in the market basket across areas when creating RPPs.
	Availability	Available at BLS web site, http://www.bls.gov/cpi/home.htm.
Fair market rents (FMRs)	Description	FMRs have been used on their own in various indices and as a component of other indices. See table 2 for details about FMRs.
Food costs	Description	ERS constructs a quarterly food at home price database from Nielsen Homescan data that record purchases of foods. One version contains prices for 52 food groups based on both UPC-coded and random weight food purchases and the other for 54 food groups based only on UPC-coded purchases. (Random-weight data are often priced quite differently than UPC-coded items.)
	Dates	1999–2006 for version 1 and 2004–09 for version 2.
	Geographic representation	26 metropolitan and 9 nonmetropolitan markets.
	Sample size	Thousands of prices from Nielsen.
	Consumption items	Detailed categories of food: fruits and vegetables, grains and dairy, meats, nuts, eggs, fats, beverages, and prepared foods. Data can be combined in numerous ways (e.g., one ERS report summarizes the price of healthy foods).
	Limitations	Limited number of metropolitan areas, only prices for food.

	Availability	Data are downloadable from ERS QFAHPD site.
National Compensation Survey (NCS)	BLS	Establishment survey of employee earnings on hourly and annual basis, and benefits. Source of BLS employment cost index, employer benefit data, and pay relatives. Collects data on 800 occupations in more than 150 local areas. Covers civilian workers in state/local government and private industry, excluding agriculture, fishing, forestry, and private household workers.
	Dates	Predecessors of survey date back to 1975; the NCS was introduced in 1996. Ongoing, except locality pay survey and pay relatives portion of NCS terminated with the 2011 federal budget.
	Geographic representation	Nation, selected metropolitan and nonmetropolitan areas, nine census divisions.
	Sample size	Not applicable.
	Consumption	State
	Limitations	Does not have data for all MSAs or all states (although division information is available). Locality survey and pay relatives were terminated with 2011 budget.
	Availability	Published tables available free on the BLS web site at http://www.bls.gov/eci/.
Occupation Statistics Employment Survey (OES)	BLS	Establishment survey of employee earnings on hourly and annual basis. Produces estimates for 800 occupations and more areas than NCS, but does not collect wages by level of work. Covers civilian workers in federal, state/local government, and private industry, excluding agriculture, fishing, forestry, private household workers, and certain national security agencies.
	Dates	Annual estimates 1997–current (most recently published May 2010).
	Geographic representation	Nation, states, all metropolitan areas, all nonmetropolitan areas, Guam, Puerto Rico, Virgin Islands.
	Sample size	Not available.
	Consumption	Not available.
	Limitations	Unlike NCS, does not collect information on wages by level of work within occupation.
	Availability	Published tables available free on BLS web site at http://www.bls.gov/oes/.

Poverty Measures

The official poverty thresholds, first set in 1963, were originally calculated based on the USDA's Economy Food Plan. Based on data from the 1955 Household Consumption Survey showing that families typically spent one-third of their after-tax income on food, the Economy Food Plan was multiplied by a factor of three to create the poverty threshold. The official thresholds are adjusted annually for price changes using the consumer price index and do not vary across the country.

In the mid-1990s, Congress requested the GAO investigate methods to adjust the poverty thresholds for geographic differences in the cost of living (GAO 1995). GAO identified 12 methods and asked 15 experts to review the methods and rate them according to their potential for adjusting the thresholds. The experts' responses were mixed, and no method was rated by a majority as having great or very great promise. Three methods were ranked by a majority as having at least moderate promise: (1) the budget method, which estimates how much money families in different areas need to purchase a market basket of goods and services to meet basic

needs; (2) the norms method, which identifies the proportion of income spent on various consumer expenditure categories and then applies normative standards to the items to be included in the market basket (such as the size of a home and the number and types of automobiles); and (3) the housing data method, consisting of a geographic cost-of-living index created using HUD FMRs. GAO concluded that there was no consensus on any one approach to adjusting thresholds for geographic differences in the cost of living, although there was consensus that several approaches (notably local indices [such as ACCRA], polling, and comparable pay) held little promise.

At the same time that the GAO was working on its report, NAS was developing recommendations for a revised official poverty measure based on actual expenditures (from recent consumer expenditure data). The NAS measure was to reflect geographic variations in housing costs and a broader measure of resources than the current measure, including near-cash benefits such as food stamps, and subtract necessary expenses such as child care and other work-related expenses, income and payroll taxes, and out-of-pocket medical care costs, including health insurance premiums (Citro and Michael 1995). The NAS recommended that the housing index should be developed using decennial census data following the methodology used for developing the HUD FMRs, should be calculated for several population-size categories of metropolitan area in nine census divisions, and should only be applied to the portion of the threshold reflecting housing costs (44 percent).

In March 2010, the Interagency Technical Working Group (ITWG) on Developing a Supplemental Poverty Measure reviewed the NAS recommendations, findings from subsequent research and development, and new data sources such as the American Community Survey (ACS).[10] The working group recommended an SPM as an alternative poverty measure and reaffirmed the NAS recommendation to adjust thresholds for price differences across geographic areas using the best available data and statistical methodology.

The ITWG recommended using ACS data to create a housing price index for quality-equivalent rental prices across areas, suggesting that the indices vary by metropolitan statistical areas (MSAs) within state with a residual non-MSA area in each state. As with the NAS recommendation, the adjustment would apply only to the housing-cost share of the threshold. With further research and better data, the ITWG suggested, the thresholds could be adjusted to reflect geographic variation in all items in the threshold and could vary for different groups (renters, homeowners with mortgages, and home owners without mortgages).

The BLS and the Census Bureau have produced SPM thresholds and poverty estimates following the ITWG recommendations (Garner 2011; Short 2011). The basic SPM poverty threshold is derived from the most recent five years of Consumer Expenditure Survey (CE) data

[10] U.S. Census Bureau (2010).

and reflects spending on food, clothing, shelter, and utilities at the 33rd percentile for all families with two children (adjusted to reflect a two-adult, two-child family). Separate thresholds are calculated for families that rent, own with a mortgage, or own without a mortgage. Thresholds are adjusted for differences in family size and number of children and for geographic variation in rental prices. The SPM also deducts out-of-pocket health care spending from family resources.

In April 2011, HHS sponsored a conference on the cost of living and the supplemental poverty measure, conducted by the University of Kentucky Center for Poverty Research (UKCPR), the U.S. Census Bureau, and the Brookings Institution.[11] The purpose of the conference was to further consider the issue of geographic adjustment to the SPM poverty thresholds. Several potential geographic indices were presented or discussed at the conference, including the BEA regional price parities, Census Bureau SPM adjustments, the CEO index, the ACCRA index, and wage-based indices.

Participants discussed the effect of local area amenities on prices, wages, and well-being, and their implications for geographic adjustment. According to economic theory, nicer amenities in certain geographic areas (e.g., better climate, better public education, less crime) drive up the costs of housing and other local prices. Wages rise as well, although not as much as prices rise, because workers are willing to accept somewhat lower wages in exchange for the greater amenities. In a completely mobile society, those who do not place as much value on the local amenities move to where they find the optimal combination of wages, prices, and amenities to suit their own tastes, and everyone's well-being is maximized.

Some participants argued that providing larger government transfers to people living in higher-cost areas would distort these market incentives (Black 2011). Glaeser (2011) expressed concern about adjusting for geographic differences in price, and noted that the prices faced by the poor may differ from those for the nonpoor, especially in housing, and that differences in transportation cost across space should also be considered. Hirsch (2011) suggested adjusting thresholds using a relative wage index (reflecting local amenities) but noted that such an approach might not be sufficiently transparent and understandable to the public and policymakers. Albouy (2011) also suggested indexing poverty thresholds by local wage levels for low-skilled workers, possibly using existing BLS pay relatives—suggesting that it may be best to ignore local wage and cost differences for nonworking households. Researchers called attention to transportation (people trading lower rental costs for higher commuting costs) and called for greater research into costs associated with moving (i.e., whether households are as mobile as economic theory assumes). Rosenthal (2011) suggested that the Census Bureau's proposed approach for adjusting by housing cost differences could be improved through regressions that control for housing quality.

[11] See http://www.ukcpr.org/Conferences.aspx. The meeting was held on April 28, 2011.

Other participants questioned the relevance of these arguments for the poverty thresholds. Poverty measures are intended to measure minimum level of need, not overall quality of life. Also, spells of poverty may be short and families cannot be expected to quickly move in response to a reduction in income. These concerns were also discussed in detail in the NAS report (Citro and Michael 1995).

Ziliak (2011) summarized the conference participants' majority opinion as the following: (1) some adjustment to the SPM thresholds for geographic differences in cost of living is preferable to no adjustment; (2) the current method of adjusting the SPM threshold for housing price differences but not other components of the consumption bundle is reasonable until better data become available; (3) the adjustment for geographic housing price differences should be based on quality-adjusted rental costs; and (4) a high priority should be given to research to inform how and for whom to adjust thresholds. The recommendation to quality-adjust rental costs further recommends a hedonic regression using data from the ACS, such as suggested by Rosenthal (2011). The lack of evidence on mobility of the poor is of particular concern since the case for geographic adjustment is strongest when there exists substantial barriers to geographic mobility that prevent the poor from moving to locations that improve well-being. Another high priority is developing a price index for a constant-quality basket of goods and services that accounts for the entire consumption bundle.

In November 2011, the Brookings Institution and the Census Bureau hosted a half-day meeting on the SPM. Although the meeting did not focus on geographic adjustments, the Census Bureau researchers (Rapino, McKenzie, and Marlay 2011) presented their work on geographic variation in the cost of commuting and recommended that this be taken into consideration in adjusting for geographic variation in the SPM.

Geographic index used for SPM. The Census Bureau has experimented with a variety of approaches to adjusting SPM and NAS thresholds for geographic variation. Initial approaches focused on adjustments based on decennial census data and HUD fair market rents, at various levels of geography (see Renwick 2011b for discussion). More recent efforts have used data from the American Community Survey (see table C3 for details). In an initial paper, Renwick (2011a) produced two sets of geographic adjustments following the ITWG recommendations—a rent index that reflects geographic variation in rental costs and a triple index that creates separate geographic adjustments for renters, homeowners with mortgages, and homeowners without mortgages.

The Census Bureau's most recent SPM geographic adjustment index reflects rents only (Renwick 2011b), consistent with the recommendations of the UKCPR/Census Bureau/Brookings meeting. Renwick notes that rental costs more accurately reflect current market conditions than do homeowner costs, because renters are more mobile and because mortgage amounts reflect factors other than home value (such as the terms of the mortgage and

the length of tenure). She anticipates that future SPM geographic adjustments will be based on rental costs, and that these will continue to be applied to separate base thresholds for renters, owners with a mortgage, and owners without a mortgage.[12] We therefore focus on the most recent SPM rent-based index. Details are summarized in table C2.

The Census Bureau's rent-based geographic index adjusts for geographic variation in gross rent (rent including utilities) and is derived using five years of ACS data (2005–09). Adjustments are applied to the portion of the threshold that reflects spending on housing and utilities (in 2008, 49.3 percent of the renter threshold, 50.2 percent of the threshold for owners with a mortgage, and 41.9 percent of the threshold for owners without a mortgage). To enable geographic adjustments to be released on public-use microdata files, Renwick limits the MSA adjustments to metropolitan areas large enough to be identified in the public-use data (other MSAs are put into a residual "other" metro area in each state). The index also provides an adjustment for use in the nonmetropolitan area of each state. Many metropolitan areas cross state lines (for example, the Washington-Arlington-Alexandria area, which also includes portions of West Virginia). In these cases, a single adjustment pertains to the entire metropolitan area.

The index is constructed by dividing the median gross rent calculated for each area by the national median (weighted by households). Prior versions of the SPM adjustments normalized the resulting index so that the geographic adjustments did not change the average threshold for the nation as a whole (e.g., Renwick 2011a). The normalization step was dropped from the most recent estimates.[13]

Interarea Price Indices

Interarea price indices estimate the difference in price levels across places at a given point in time. The BEA and BLS have done considerable work to calculate regional price parities (RPPs) using data from the Consumer Price Index and the ACS. A private group called the Council for Community and Economic Research (C2ER) produces the ACCRA index that relies on chambers of commerce, economic development organizations, and university applied economic centers to report the prices of goods and services for professionals and managerial households in their areas. Researchers Carillo, Early, and Olsen (2010) have developed the CEO index that uses data from HUD, the Census Bureau, BLS, and ACCRA to produce a panel of price indices for all geographic areas in the United States. Private organizations specializing in employee mobility management, such as Runzheimer International, also produce detailed cost-of-living comparisons between areas for their clients.

Regional price parities. Development of interarea price indices is a complex process. Although the BLS publishes a consumer price index for key metropolitan areas, as well as by census region and size of city, the CPI is not designed to show differences in prices across these

[12] Personal communication with Trudi Renwick, February 23, 2012.
[13] Personal communication with Trudi Renwick, March 2, 2012.

areas (rather, it shows differences in inflation between areas).[14] Also, prices are gathered from urban areas and so do not reflect rural areas.

To enable comparison across areas, BEA, in a joint effort with BLS, first produced RPPs for 38 metropolitan and urban areas in 2003 and 2004 (Aten 2005, 2006). The RPPs are used to adjust BEA measures of regional income to reflect price level differences across regions. BEA has expanded this effort, most recently completing 2005–09 RPPs for the metropolitan and urban areas covered by the CPI, by state, and for all metropolitan areas (Aten, Figueroa, and Martin 2011). The RPPs released to date are experimental. In June 2012, the BEA will release prototype RPPs based on 2006–10 data. The 2006–10 estimates will include RPPs for nonmetropolitan areas in each state as well as metropolitan areas, so that a complete set of indices will be available. Beginning in 2013, RPPs will be released annually as official estimates, using a rolling five-year data sample corresponding to the five-year periods covered in the ACS. RPPs are provided overall and separately for goods and services. The state-level RPPs also include detail by expenditure class (including separate RPPs for medical goods and medical services). However, according to Aten, the separate RPPs by expenditure class have not been reviewed in detail for all states and should be used with caution.[15]

To calculate RPPs, BEA applies hedonic regressions to the CPI data to control for differences in characteristics of goods and services priced in BLS index areas, such as packaging, unit size, and type of outlet sold. Prices are weighted using the expenditure weights from the CE. The expenditure weights reflect the allocation among various expenditures across all consumers in a given BLS index area. Prices (other than rent) for areas outside BLS index areas are obtained from neighboring areas. BEA calculates rents for a standard quality apartment using hedonic regressions based on data in the five-year ACS. The large sample size of the ACS enables rents to be calculated at a detailed geographic level, including the rural versus urban portions of counties.

ACCRA. The ACCRA index measures differences among urban areas in the cost of consumer goods and services for professional and managerial households in the top income quintile.[16] The composite index is based on six components: housing, utilities, grocery items, transportation, health care, and miscellaneous goods and services. Data are collected each quarter from local chambers of commerce, economic development organizations, and university applied economics centers in participating areas. Because the areas participating in the ACCRA can vary from quarter to quarter, the ACCRA cannot be used to measure change across time in the cost of living in any area (C2ER 2009). Prices are collected for 60 items in each area, and the index

[14] See http://www.bls.gov/cpi/cpifaq.htm#Question_19.
[15] Personal communication with Bettina Aten, BEA, February 27, 2011. As an example of the limitations of the expenditure class detail, Aten notes that the D.C. index for medical services seems surprisingly low. Upon further investigation, this is because there were few or no price quotes for dental services in D.C.
[16] Information provided here is drawn from the C2ER website at http://www.coli.org and C2ER (2009).

reflects a total of over 50,000 price quotes. Data collectors are asked to collect prices from at least five establishments where professional and managerial families would typically shop. A three-stage review process ensures that published price data are accurate. Items are weighted using expenditure weights for upper-quintile families calculated from the CE.

Numerous academic studies have used the ACCRA index to measure variation in the cost of living. For example, Moretti (2011) uses the nonhousing component of the ACCRA index in a study that shows how adjusting for geographic variation in the cost of living affects measures of wage inequality. ACCRA components are also used for certain aspects of the CEO and self-sufficiency indices.

Carillo, Early, and Olsen. The CEO provides a panel of price indices for housing, other goods, and all goods for metropolitan and nonmetropolitan areas of each state (Carillo et al. 2010). The geographic housing price index is based on data from HUD's 2000 Section 8 Customer Satisfaction Survey reflecting 173,000 units throughout the United States, to which the authors append census tract data from the 2000 decennial census. The geographic housing price index is estimated using hedonic regressions that control for numerous indicators of dwelling unit and neighborhood quality.

Data on nonhousing prices are obtained from ACCRA, since the data underlying the CPI are not available to independent researchers. Regression techniques are used to impute nonhousing prices in areas not covered by the ACCRA. In contrast to the ACCRA methodology, the CEO weights the individual components of its index using expenditure weights that reflect all consumers rather than just those in the top income quintile. The authors note that virtually identical results are achieved with the two methods. Nevertheless, it should be noted that ACCRA prices are collected at locations that upper-quintile families would typically shop, so the nonhousing component of the CEO index may still reflect upper-quintile families to some degree.

The estimates from the CEO model are projected forward and backward from 2000 using BLS time-series price indices.[17] CEO indices are available for each metropolitan area and for the nonmetropolitan part of each state and cover the years from 1982 through 2010.

Runzheimer International. Runzheimer International is a private company specializing in employee mobility management. Clients include private organizations, the federal government, and state governments. Among other services, Runzheimer International calculates the IRS standard taxpayer mileage allowance and the basic allowance for housing used by the military. Runzheimer International provides relocation services, including calculation of cost-of-living reimbursements.

[17] An alternative to using the CEO model would be to use ACCRA cost-of-living indices directly, although these only cover urban areas and do not include the housing quality and expenditure weight adjustments by CEO.

While other organizations may provide similar relocation and employee mobility services, we focus on Runzheimer International due to its inclusion in a 1995 GAO report that investigated possible cost-of-living adjustments to poverty thresholds. Although the company's web site does not list a cost-of-living index for purchase, Runzheimer International continues to produce detailed cost-of-living comparisons for its clients. The comparisons include the cost of housing, transportation, goods and services, and sales and income taxes for families at different income levels (the lowest income level is typically $20,000).[18] Although we did not request a quote for the price of a cost-of-living index, the 1995 GAO report listed the basic fee as $345 per location or $26,000 per 100 locations (GAO 1995).

Housing and Transportation Index

Researchers at the UKCPR/Census/Brookings meeting called for greater attention to transportation and the trade-off between lower rental costs and higher commuting costs. The Center for Neighborhood Technology (CNT) produces a housing and transportation affordability index that compares the combined cost of housing and transportation across areas. The index reflects the sum of average housing and transportation costs for a neighborhood, divided by average neighborhood income. The purpose of the index is to show the extent to which neighborhoods are affordable when both housing and transportation are taken into consideration. The 2010 index includes costs for 337 metropolitan areas in the United States and includes micropolitan areas. Housing costs come from the ACS for owners and renters; transportation costs include auto ownership, auto use, and transit and are derived from census and other sources for 2007 and 2010. A 2011 HUD news release announced that HUD had granted a large contract to the Manhattan Strategy Group and its subcontractor, CNT, to create the National Housing and Transportation Affordability Index.[19]

CNT displays the Housing and Transportation Affordability Index in maps and lists the index for particular areas on its web site.[20] Information is displayed in terms of the costs of housing and transportation relative to income. The underlying data are available for a fee, but we have not yet obtained a price quote. The Housing and Transportation Affordability Index provides information down to the neighborhood level and is particularly focused on calling attention to the trade-off that families make between housing and transportation costs within the same metropolitan area. However, the data developed for the index might also enable comparisons in the combined housing and transportation costs between metropolitan areas. The index does not currently cover areas that do not fall into metropolitan or micropolitan categories.

[18] Personal communication with Cathy Bauman, Runzheimer International, March 16, 2012.
[19] See HUD press release No. 11-180 at http://portal.hud.gov/hudportal/HUD?src=/press/press_releases_media_advisories/2011/HUDNo.11-180.
[20] See http://htaindex.cnt.org/.

HUD FMRs and 50th Percentile Rents

FMRs are created by HUD for use in the Housing Choice Voucher program and other HUD-subsidized housing programs. The FMRs generally reflect the 40th percentile of rent plus utilities for a standard quality apartment and are adjusted to reflect the rents of recent movers. However, in some areas, they reflect the 50th percentile of rent and utilities. Beginning in 2012, FMRs are based on five-year ACS data.[21] Previous FMRs relied on data drawn from multiple sources including the decennial census, ACS, the American Housing Survey, and random digit dialing surveys.

FMRs are provided for metropolitan areas and nonmetropolitan counties and are available for the insular areas. Prior to the development of the ACS, researchers turned to FMRs for annual local area rent estimates because data were otherwise generally unavailable except through the decennial census (see, for example, Jolliffe 2006 and Short 2001). However, HUD recommended against the use of FMRs for this purpose (Short 2001). With the development of the ACS (which replaced the decennial census long form) researchers have access to more timely data on household rents, lessening the need for use of the FMRs for research.

Although the 2012 FMRs are based on the ACS, HUD continues to recommend against their use for adjusting poverty thresholds, citing many of the same objections as were reported by Short (2001).[22] HUD notes that the statute governing the calculation of FMRs is specific to HUD's rental assistance programs; there have been changes over time in the methodology and data used to develop the FMRs, making them inappropriate for use as a time series. The time-series limitation does not seem relevant when considering the use of FMRs for adjusting guidelines going forward, especially since the FMRs will now be based largely on five-year rolling samples of ACS data. However, a limitation that seems of particular relevance is that the FMRs do not represent the same percentile of rent in all areas. FMRs are set at the 50th rather than the 40th percentile in some large metropolitan areas (21 in 2012) to provide assisted households with access to more parts of the metropolitan area and to reduce the concentration of voucher tenants in pockets of the metropolitan area.[23] Also, FMRs are not allowed to fall below a state minimum.

Rather than using FMRs, HUD advises that researchers use the ACS to obtain data on rents for research purposes (HUD 2012). However, researchers face some challenges with the ACS: the public-use version of the ACS does not include an identifier for metropolitan area and not all counties are identifiable in the public-use data. Researchers requiring detailed rental data at the metropolitan and unidentified geographic levels could consider HUD's 50th percentile

[21] In 2012, results from local area rent surveys were used in place of the ACS-based data in two areas because the surveys produced results that are statistically different from the ACS-based rents (HUD 2011).
[22] E-mail from Peter Kahn, Director, Economic and Market Analysis Division, Policy Development and Research, U.S. Department of Housing and Urban Development, March 9, 2012.
[23] The 21 MSAs that use 50th percentile FMRs are listed in the Federal Register (HUD 2011).

rents as a possible alternative to FMRs. Unlike the FMRs, the 50th percentile rents reflect the same relative level of rent for all areas.[24]

Family Budget Approaches

Unlike the poverty thresholds (which reflect observed patterns of spending from consumer expenditure survey data), the family budget approach estimates the cost of a basic standard of living by adding up the amount of money needed to purchase adequate housing, food, child care, transportation, health care, and other necessary expenses, while also paying required taxes. A 1995 GAO report (issued just prior to the NAS recommendations) surveyed 15 experts and found that geographic indexation by family budget was viewed as a promising approach to measure differences in the cost of living. The NAS recommendations also mentioned the family budget approach as a possibility for geographic indexation, referring to findings from the BLS family budget program (which ended in 1981).

There are two family budget indices. One is produced by the EPI and exists for all 50 states; the other, the self-sufficiency index, is produced by the Center for Women's Welfare under the leadership of Dr. Diana Pearce. This index is available for 37 states, but the years represented vary by state.

The EPI constructs a basic "family budget" for six representative family types (families with one and two parents and one, two, and three children) by metropolitan and rural areas within a state (Lin and Bernstein 2008a). The index is produced for 521 distinct urban areas and 48 rural areas (one per state). EPI family budgets represent the cost to achieve a modest standard of living. For example, they use the low-cost USDA food plan rather than the thrifty plan used for setting SNAP benefits. Rent calculations use HUD's FMRs (which include utilities) in the 40th (or in some cases 50th) percentile of county-level rental market prices. Child care costs come from the Children's Defense Fund 2000 report and are price-adjusted using a BLS child care deflator. Transportation costs are taken from the National Household Travel Survey (NHTS) for different MSA sizes within the nation and include travel for work and nonsocial purposes. The NHTS provides number of miles traveled and is converted to costs using IRS cents-per-mile estimates. Health care comes from the Medical Expenditure Panel Survey separately for families with and without employer-sponsored coverage (including premiums and out of pocket expenses). Nongroup data are from E-Health insurance. Taxes are computed by the tax model developed by the Citizens for Tax Justice and include personal income taxes, payroll taxes, state income taxes, and local wage taxes. Other necessities come from the CE.

The Self-Sufficiency Index defines the amount of income needed to meet basic needs (including taxes) without public subsidies or private assistance. Similar to the EPI, the Self-Sufficiency Index is compiled from various data sources:

[24] The 50th percentile rents are published each year on the HUD web site at http://www.huduser.org/portal/datasets/50per.html.

- housing costs are based on FMRs;
- child care costs are based on market-rate costs (at the 75th percentile);
- food costs reflect the USDA low-cost food plan and are varied by state using the ACCRA cost-of-living index;
- transportation reflects the cost of owning a car (using CE data for families with income between the 20th and 40th percentile) plus either insurance costs (where public transportation is inadequate) or public transportation (the cost of a monthly adult pass); and
- health costs are based on data from the Medical Expenditure Panel Survey (for premiums and out-of-pocket costs, adjusted by data from large insurance companies in each area).

Miscellaneous expenses are calculated as 10 percent of all other costs. The Self-Sufficiency Index takes into account federal and state income taxes, payroll taxes, state and local sales taxes, and federal and state tax credits.

The measure is used as a measure of income adequacy in states by local advocates and others. Data are available through an online calculator at http://www.thecalculator.org/.

Occupational Pay Relatives and the BLS OES

At the UKCPR/Census/Brookings meeting, Albouy (2011) suggested indexing poverty thresholds for working households to local wage levels for low-skilled workers, citing the BLS pay relatives as a possible source of adjustment. The BLS pay relatives are calculated for nine occupational groups based on the National Compensation Survey (NCS), a BLS establishment survey. Regression techniques are used to control for geographical differences in occupational composition, establishment and occupational characteristics, and different dates of data collection during the year, isolating the geographic effect on wage determination.

Pay relatives are available for 77 metropolitan areas for 2004 through 2010. Funding for production of the pay relatives was terminated with the 2011 federal budget. Data on occupational pay will continue to be available through the BLS Occupational Employment Statistics (OES) program. However, while the OES covers all metropolitan and nonmetropolitan areas, it does not collect information on wages by level of work within an occupation. Therefore, differences between areas reflect not only the differences in wages between those areas, but also differences in the composition of workers within an occupation (as well as factors other than geography that might affect wages).

Federal Employee Cost-of-Living Adjustments

The military, the State Department, and the U.S. government more broadly through the Office of Personnel Management also adjust salaries for geographic variation in the cost of living. Federal employees are paid through one of two systems, either the Federal Wage System (FWS), which was developed to pay federal blue-collar workers rates comparable to those earned in the private

sector, or the General Schedule (GS), which was developed to pay federal white-collar workers. The U.S. Foreign Service uses a separate pay scale but uses the same locality pay percentages as the GS. Civilian employees of the U.S. military are paid using the same locality adjustments as for other federal workers. Pay for soldiers does not vary by locality, although housing allowances vary by geographic location. To summarize, all three organizations base their pay scales for civilians on the FWS and GS.

The FWS pay scale is based on an annual wage survey currently administered by the Department of Defense Civilian Personnel Advisory Service. This survey is conducted separate from the BLS surveys because labor unions have the right under law to participate in the collection and review of these data prior to their use in determining a wage line.

The GS pay scale is based on a survey of nonfederal pay (including private industry, state government, and local government) for similar work levels in a pay locality. There are currently 35 locality pay areas (31 metropolitan areas in addition to areas for Alaska, Hawaii, and other nonforeign areas [i.e., insular areas], and "rest of U.S."). The primary source for the geographic differences in GS pay has been the NCS. At the request of the Federal Salary Council, the BLS has developed and is testing a model that combines NCS and OES data to extend the locality adjustments to metropolitan areas not covered in the NCS. The Federal Salary Council is not yet sufficiently satisfied with the results of the model to recommend its use and continues to recommend locality pay adjustments based on the NCS. As mentioned above, funding for the locality pay portion of the NCS was eliminated with the federal 2011 budget. The Federal Salary Council recommends full reinstatement of funding for the NCS program so the data can continue to be used for comparisons between federal pay and pay in the nonfederal sector (Federal Salary Council 2011).

Median Family Income

As noted previously, many states use some share of SMI to determine eligibility for child care subsidies. HHS suggested one possible alternative: setting poverty guidelines in the insular areas as a percentage of median family income (see section V). Annual median family income estimates for families of various sizes are available from the Census Bureau's web site at http://www.census.gov/hhes/www/income/data/statemedian/.

Individual Goods

Research on the variation in prices for individual goods may also inform adjustment of the poverty guidelines to reflect geographic differences in cost of living. The ERS Food-at-Home Index and the Census Bureau's work on transportation cost provide recent examples of analysis of geographic price variation in particular goods.

ERS publishes a quarterly food-at-home price database.[25] The database was developed to provide market-level food prices that can be used to study how prices affect food choices, intake, and health outcomes. The database is constructed from Nielsen Homescan data that follow households over an entire year to track both UPC-coded and random-weight purchases. Household purchases are aggregated into 52 food groups and quarterly prices are derived for 35 market groups (26 based on Nielsen households in metro areas and 9 based on households in nonmetro areas). Prices for each good are derived from the average price paid by households in each market area. The data do not include prices from discount supercenters or warehouse club stores such as Costco and Walmart, which now capture over 30 percent of consumer food-at-home expenditures. Nielsen calculates household-level weights to provide a demographically balanced panel of data for 1999–2006 that matches the U.S. population as closely as possible at the metro, regional, and national levels using census demographic information. The authors report that cross-market price variation can be as much as three to four times greater than annual food price inflation. This food index has been used in studies such as Gregory and Coleman-Jensen's (2012) study of how food prices affect food security for SNAP households.

Census Bureau researchers Rapino, McKenzie, and Marlay (2011) presented their work on measuring the variation in commuting expenditures at the Joint Statistical Meetings of the American Statistical Association. As they note, they question the NAS recommendation to subtract a flat amount for other work-related expenses, including transportation to work. These researchers estimated average commuting expenses for automobile commuters across 100 urban areas, regions, and divisions using two methods: (1) state gas prices and (2) federal reimbursement rates. They use time spent traveling to work reported on the 2009 ACS and likely vehicle speed (from the 2010 annual urban mobility report), then translate estimated travel time to travel costs using two price-estimation methods. Rapino and her coauthors show wide variation in transportation costs across these urban areas. They suggest that the SPM should factor in geographic variation in travel to work costs when deducting other work-related expenses from family income.

Medical Care Costs

As mentioned previously, medical care costs account for 6.5 percent of consumer expenditures and are explicitly included in a number of the cost-of-living indices described above. There is widespread agreement that medical care costs vary tremendously across geographic areas. There is also widespread agreement that an overall index of medical care costs is difficult to construct and that incorporating geographic variation into such an index is even more challenging. In this section we review what is known about variation in medical care spending across geographic areas, describe how medical care costs are incorporated into the overall cost-of-living indices mentioned above, and discuss three health-specific indices designed to capture geographic variation in medical care costs.

[25] Todd et al. (2010) document this methodology.

Geographic variation in health care spending, both within and across states, has been well documented for all personal health care spending, under the Medicaid and Medicare programs, and among those with employer-sponsored insurance (Chernew et al. 2010; CBO 2008; Cuckler et al. 2011; Fisher et al. 2003; Gilmer and Kronick 2011; Martin et al 2007; Wennberg and Gittelsohn 1982; Zuckerman et al. 2010). While there is widespread consensus that tremendous variation exists, there is less agreement on what drives the variation.

Much of the research on geographic spending in health care has been done using data from the Medicare program because data on service use and expenditures are readily available for all enrollees. Moreover, Medicare's standard benefit package across the nation makes comparisons across areas appropriate.[26] What is clear from the body of research on Medicare variation is that health status of the population, input prices, Medicare payments, patient preferences, practice patterns, and market factors all contribute to variation in expenditures (Fisher et al. 2003; Gilmer and Kronick 2011; Sutherland, Fisher, and Skinner 2009; Zuckerman et al. 2010). Moreover, service use in the Medicare program varies substantially less than do Medicare expenditures, suggesting that variation in price is partially driving geographic differences.

For a variety of reasons, it is more difficult to interpret geographic variation in Medicaid and employer-sponsored health care spending. Medicaid eligibility and program benefits range considerably from state to state and thus separating geographic variation in spending from differences in populations and benefits is complicated. Very few studies have examined this issue and those that do focus their analysis on a limited population of Medicaid eligibles (Gilmer and Kronick 2011). Similarly, data on geographic variation in employer-sponsored premiums exists but benefit packages and cost-sharing provisions are not consistent across plans or geographic areas.

In addition, geographic variation in spending across payers is not correlated. Medicaid spending per enrolled person appears to be highly correlated with overall per capita personal health care spending, but Medicare spending per beneficiary bears little relationship to overall per capita spending (Martin et al. 2007). Chernew and colleagues (2010) examined spending and utilization patterns for individuals with commercial insurance from large firms and Medicare enrollees across geographic areas. They found that hospital utilization for commercial plans was positively correlated with that for Medicare beneficiaries. However, there was only a small but negative correlation for per capita spending between commercial payers and the Medicare program.

To the extent that there is a strong correlation between health care spending and other consumer spending, a separate cost index for medical care may not be necessary. In fact, health

[26] The exception to this is for Medicare beneficiaries who have chosen to enroll in Medicare Advantage plans, where data on service use are not readily available and enhanced benefits can be provided.

care expenditures are captured in some of the overall indices mentioned before, including the ACCRA, BLS RPP, CEO, Self-Sufficiency Standard, and EPI indices. At the same time, health care costs are not included in the SPM except to the extent that medical out-of-pocket costs are subtracted from income in calculating poverty rates. If health care costs were correlated with housing costs, constructing the more complicated price index for health care may not be necessary.

Unfortunately, there is virtually no prior literature that addresses the extent to which such a correlation exists, although we explore this correlation in a later section of this review. One study by CBO (2008) examined whether variation in Medicare spending is comparable in magnitude to variation in expenditures for other goods and services. Using data from the CE for 24 metropolitan areas, CBO compared variation in Medicare spending in these areas to that for food, housing, and transportation. They found that geographic variation in Medicare spending per beneficiary was similar to that for housing and transportation, with coefficients of variation ranging from 0.143 to 0.148. Variation in food costs was smaller with a coefficient of variation of 0.120. The CBO analysis did not explore the extent to which costs across these expenditure groups covaried. However, they found that both food and housing costs were significantly related to income in the area, but transportation and Medicare spending per beneficiary were not. After adjusting for income, coefficients of variation were dramatically reduced for food and housing, but not for transportation and Medicare spending. Importantly, the extent to which personal health care spending across all payers (e.g., commercial, Medicaid, Medicare, and individual) varies across these areas has not been explored. There is a clear consensus that geographic variation in health care costs is driven by the health status of the population, which is endogenous to spending, physician practice patterns, patient preferences, and the price of services consumed. Consequently, identifying the variation attributable to price is difficult, and consideration is needed about whether practices, patterns, and preferences; so-called health care amenities; and variation in health status should be captured in such an index. Importantly, "there is no overall price index for medical care—consisting of medical care expenditures from patients' out-of-pocket payments, private insurers, and government insurers" (Schultze and Mackie 2002).

Medical Care in Overall Cost-of-Living Indices

The Consumer Price Index. Evidence from the CPI has been used extensively to document the fact that medical care costs are rising faster than inflation. As mentioned previously, however, the CPI is not designed to measure variation in medical care prices across geographic areas but rather to measure variation in price changes across areas over time. However, since data from the CPI underlie the BLS RPPs, the medical care component of the index is described here.

Medical care expenditure is one of the eight major product groups included in the CPI. Importantly, the CPI is limited to expenditures on which consumers make a direct outlay for services. As a result, expenditures made by employers and the Medicare and Medicaid programs are not included in the CPI or in the CE. The medical care component of the CPI includes out-of-pocket expenditures for prescription drugs; over-the-counter drugs and medical supplies; services from physicians, dentists, and other medical professionals; hospitals and related services; and health insurance. Health insurance as captured by the CPI includes only the portion of employer-sponsored coverage that is paid by the consumer, the cost of Medicare part B premiums, and the cost of private nongroup coverage. The CPI does not include the share of employer-sponsored premiums paid to insurance companies by employers or spending by Medicare, Medicaid, and the Children's Health Insurance Program. Expenditures made on health insurance by individuals are reallocated to the other medical care components—services from physicians, hospitals and related services, and others—using a standard allocation formula. As a result, the health insurance component of the CPI contains only the costs of administering the insurance, maintaining reserves, and insurer profit. That only consumer expenditures are included in the CPI explains, in part, why medical care costs constituted only 6.6 percent of consumer expenditures in 2010, compared to 17.0 percent of gross domestic product.

BLS's construction of the medical care component of the CPI has been criticized for a number of reasons and was the subject, of an Institute of Medicine (IOM) study a decade ago (Schultze and Mackie 2002). Most important, there is concern that the rapid technology diffusion in health care is not being captured in medical care price indices and that BLS market basket weights are not calculated frequently enough. This could be problematic if individuals substitute one type of service for another as technology advances, for example, the recent shift from talk therapy to the use of antidepressant medications to treat depression. If this substitution represents a shift from a more expensive service to a less expensive service, the reduction in the cost of providing care would not be captured in medical care price indices, since physician services and prescription drugs are separate categories. While BLS has been moving more toward pricing care for a given condition or episode based on diagnosis-related groups in hospital settings, the whole sector faces numerous challenges to implementing this strategy (Schultze and Mackie 2002).

The IOM study panel made the following recommendations regarding the construction of the Medical Care Price Index: (1) to move toward diagnosis-based methods rather than input-based methods to the extent feasible; (2) to include the portion of health insurance paid by employers in one version of the CPI; and (3) to convene a task force to develop and implement a medical care price index that includes expenditures by consumers, employers, and governments (Schultze and Mackie 2002).

Currently, Ana Aizcorbe and David Cutler are in the process of developing a medical care cost index that would address critiques of the CPI related to monitoring health costs over time. The index will use prices for the treatment of specific conditions (to account for quality

improvements over time) and recalculate market basket weights more frequently to account for rapid technology change inherent in the health care industry.

As mentioned in the previous section, Aten and colleagues (2011) have used hedonic regressions to produce RPPs for medical goods and services. The issues that have been raised regarding the construction of medical care price indices on the CPI, using prices for services and fixed weights that are updated infrequently, are also relevant in the construction of RPPs, especially given the well-documented variation in treatment patterns across geographic areas.

ACCRA. ACCRA's health index reflects five items: the average area fee for (1) an optometrist visit, (2) a routine exam by a general practitioner, and (3) a dental visit, and the average prices of (4) Lipitor and (5) Advil. The items are weighted with other commodities using expenditure weights for upper-quintile families calculated from the CE. As a result, ACCRA's index excludes geographic variation in health costs due to practice patterns, preferences, and the health of the population. This approach is fundamentally different than the approach used to construct the medical care component of the CPI in that it includes the full price of the five items rather than the consumer expenditure on the items. Importantly, the application of the CE weights may not be appropriate given that only consumer expenditures are captured in the CE and not the fees charged for the service, which would overstate consumer spending on medical care.

EPI. The health care component of the EPI's family budget is based on the weighted average for a given family size of employee premium contributions to employer-sponsored coverage, nongroup premiums, and Medicaid premiums (set to zero), plus average out-of-pocket costs. As such, the EPI measure accounts only for the costs borne by individuals and families and not the costs covered by employer-sponsored coverage, Medicaid, and Medicare. Consequently, variation in the prevalence of employer-sponsored coverage, employer benefit packages, and premium contributions, as well as the generosity of the Medicaid eligibility, is built into the variation across areas. This approach is consistent with the approach taken to construct the medical care component of the CPI.

Medical Care Specific Indices

The Milliman Medical Index and Group Health Survey. Few sources of data are available that document geographic variation in health care spending under private health insurance coverage for a standardized benefit package.[27] One such source is the Milliman Medical Index (MMI), which relies on a survey of insurers to measure the cost of health care for

[27] Both the Medical Expenditure Panel Survey insurance component and the Kaiser/HRET Annual Employer Survey collect information from employers regarding health insurance premiums and policies. These surveys also indicate wide geographic variation in health insurance premiums, but these estimates do not represent a consistent package of services.

a typical family of four in an average employer-sponsored preferred provider plan (PPO) that takes into account employer premiums, as well as employee costs for premiums, deductibles, and copayments. While the overall Milliman index is based on national average utilization and prices, the index is also constructed for 14 cities. By identifying costs for a standardized benefit package, the Milliman index represents variation in how care is delivered and in the price of health care inputs. The most recent Milliman data find that nationwide costs for a PPO policy for a family of four averaged $19,393 in 2011 and ranged from a low of $17,336 in Phoenix to a high of $23,362 in Miami (Milliman 2011).

In addition, Milliman's Group Health Survey (GHS) produces similar estimates for a standard set of benefits and population demographics separately for PPOs and HMOs. Like the MMI, the GHS produces price estimates that vary across areas only by utilization and the price of health care inputs and is derived from a survey of insurers. The advantage of the GHS relative to the MMI is that estimates from the GHS are available at state and MSA levels. In the past, the GHS was produced about every other year; however, the latest version of the survey was conducted in 2010, and there are no plans to produce it in the future.

In many ways, the Milliman Group Health Survey would be a useful metric to account for geographic variation in the cost of medical care, in that it captures only variation in how care is delivered and the price of health care inputs for a standard benefits package. However, similar to the arguments made regarding whether amenities should be incorporated into cost-of-living indices, there are arguments whether variation in the way care is delivered, which is driven by a number of market factors but also by variation in the taste for medicine, should be included in a medical care cost index. While we were interested in analyzing these data further, the cost to purchase the most recent year—$4,000—was not in the project budget.

Geographic Practice Cost Index. The Medicare program has long recognized that geographic variation in the cost of input prices exists and adjusts reimbursement accordingly. The Geographic Practice Cost Index (GPCI) is used to adjust reimbursement for physicians for geographic variation in physician work, practice, and malpractice expenses. The GPCI is based on relative wages of six categories of professional nonphysician occupation, including lawyers, social workers, teachers, and writers, from the BLS's Occupational Employment Survey. This use of alternative professions was initially designed to account for not only geographic variation in cost of living and amenities, but also to avoid historical patterns of physician fees from affecting the adjustment. However, physician fees are only adjusted by 25 percent of the geographic variation in the relative wages of alternative professions.

The practice expense GPCI is based on the wages of nonphysician staff (including registered and licensed nurses, health technicians, and clerical workers) and HUD's FMR index for a two-bedroom residential apartment. These items are included because staff and office rent

are the major components of physicians' practice expenses that vary geographically. The malpractice premium GPCI is based on the average malpractice premium in an area.

Each of the components is weighted by the Medicare Economic Index and by relative value units. Geographic adjustments are made over 89 physician payment areas that represent metropolitan and nonmetropolitan areas in some states and statewide adjustments in other states. However, the index is created at the county level and aggregated based on relative value units in the county to the 89 physician payment areas. Importantly, adjustments are also made to achieve policy goals such as increasing incentives to physicians to locate in underserved areas. These incentive adjustments are separable from the GPCI and were removed for our comparative analysis.

The hospital wage index. The hospital wage index is used by the Medicare program to adjust for geographic variation in labor costs of hospitals reimbursed under the Inpatient Prospective Payment System. The wage index is generated using information on wages and hours for four categories of labor reported on Medicare Cost Reports Worksheet S-3: average hourly wages for (1) registered nurses, (2) licensed practical nurses, (3) medical technicians, and (4) nurse aides, orderlies, and attendants in each geographic location are weighted by the national percentage of hours worked in each category. Adjustments are made based on 441 labor markets, including 365 MSAs and the remaining nonmetropolitan areas of states. In addition, adjustments are made to promote policy goals, including higher payments for disproportionate share and teaching hospitals and to support higher payments for nonmetropolitan areas. Moreover, hospitals can petition to be moved to another area if they are competing for labor from a broader geographic area, for example, nonmetropolitan hospitals located near the border of a metropolitan area. These incentive payments and hospital petitions are separable from the hospital wage index and were removed for our comparative analysis.

IOM Report on Geographic Adjustment in Medicare Payment. The Department of Health and Human Services recently commissioned the IOM for guidance on how to increase accuracy of geographic adjustments in costs under the Medicare program. While the IOM study is still in process, its phase one report has made a number of recommendations. The IOM argued that consistent sets of data and criteria be used to adjust physician and hospital payments. This recommendation included using a consistent geographic area for adjustment of physician and hospital services—specifically MSAs and rural parts of states. Other recommendations included that both the hospital wage index and the GPCI use a broader set of occupations to create input prices for labor; that data on labor costs be drawn from firms across the health sector but not from other sectors, and that the hospital wage index use data from the BLS's Occupational Employment Survey and include benefit costs. Finally they recommended that new sources for commercial rents be identified and incorporated into the GPCI (IOM 2011).

IV. Correlations across Indices

In this section, we discuss the extent of correlation between various indices, focusing first on the correlation among the overall indices, then the correlations between the housing cost and medical components, and finally the correlation between the medical component and composite indices. Of course, the correlations provide a general impression of differences across the indices. It is not possible to dissect the specific reasons for those differences.

We have included all key indices available free or at low cost. We include the 2009 ACCRA, RPP, and CEO indices, which are designed to compare differences in the cost of living across a complete set of consumer items and the census SPM rent index. We create indices from the ACS median family income and EPI budget values by dividing the dollar amount in each area by the unweighted mean of all areas.[28] The EPI index reflects the most recently available (2007) budgets and is calculated for two-parent and two-child families. The ACS median family income reflects 2009 income for a family of four.[29] The 2009 BLS pay relatives for all occupations are included as are the 2009 BLS pay Relatives for services, as possibly more reflective of low-wage workers.

The indices vary in the number of areas covered—from 77 metropolitan areas in the BLS pay relatives to 366 metropolitan areas in the BEA RPPs and the CEO model. A few (the Census SPM rent index, CEO model, and ACS median family income) include nonmetropolitan areas. However, these areas are not reflected in the tables. When displaying the correlations among the housing and medical components of the indices, correlations by state are shown where indicated.

Table C4 compares the most comprehensive measures: the composite index for ACCRA, BEA RPPs, EPI, the Census SPM rent index, CEO, and the ACS median family income index, and the BLS pay relatives for all occupations and for services. All the indices except the ACS median family income index and BLS pay relatives are highly correlated. The BEA RPP and census SPM measure are the most highly correlated (0.938). The ACS Median Family Income index is moderately correlated with the other indices, with correlation coefficients ranging from 0.605 to 0.675. The BLS pay relatives for services is highly correlated with the ACCRA, EPI, CEO, and BLS pay relatives for all goods, and is moderately correlated with the other indices.

[28] We weight each area equally in the index because its purpose is to compare the cost of living across areas, without respect to population size in each area. This approach is consistent with the ACCRA and CEO index.
[29] We select these family types because they are the closest readily available concepts to the family definition used in the SPM.

Table C4. Comparing Composite Index Values for Metropolitan Areas

	ACCRA	BEA RPPs	EPI (2 parent, 2 child)	Census SPM rent index	CEO	ACS median family income (family of 4)	BLS pay relatives (all)	BLS pay relatives (services)
Number of areas	221	366	363	258	366	366	77	77
Minimum	0.843	0.786	0.798	0.607	0.855	0.538	0.790	0.800
Maximum	1.663	1.243	1.426	1.716	1.347	1.693	1.200	1.250
Range	0.820	0.457	0.628	1.109	0.492	1.155	0.410	0.450
Ratio of max. to min.	1.973	1.582	1.787	2.825	1.575	3.148	1.519	1.563

	ACCRA	BEA	EPI	Census	CEO	ACS	BLS—all	BLS—services
ACCRA		0.859	0.732	0.860	0.861	0.621	0.743	0.736
BEA			0.701	0.938	0.884	0.660	0.745	0.694
EPI				0.713	0.762	0.675	0.753	0.726
Census					0.876	0.635	0.713	0.686
CEO						0.659	0.789	0.797
ACS							0.698	0.605
BLS—all								0.884

Table C5 shows the correlations among the rent components of the ACCRA, BEA RPPs, EPI, Census SPM, and CEO indices.[30] The ACCRA housing index is based on rents and housing purchase prices for units meeting specified criteria (e.g., size, number of bathrooms). EPI uses the HUD FMRs for the housing component of the family budget, using the FMR for a two-bedroom unit for a family with two adults and two children. The census SPM index reflects median gross rent for a two-bedroom unit with complete kitchen and bathroom facilities from the ACS. As described previously, the CEO model's housing price index is estimated using hedonic regressions based on data from HUD's 2000 Section 8 Customer Satisfaction Survey and the 2000 decennial census (results are then adjusted forward to other years using BLS time-series price indices). All four housing indices are highly correlated, with correlation coefficients ranging from 0.796 (ACCRA and CEO) to 0.969 (EPI and the Census Bureau).

Table C5. Comparing Rent and Housing Index Values for State and Metropolitan Areas

	ACCRA	BEA RPPs	EPI (2 parent, 2 child)	Census SPM rent index	CEO
Number of areas	221	51	363	258	366
Minimum	0.670	0.658	0.673	0.607	0.655
Maximum	2.488	1.460	2.209	1.716	1.950
Range	1.818	0.802	1.535	1.109	1.294
Ratio of max. to min.	3.713	2.218	3.280	2.825	2.975

	ACCRA	BEA	EPI	Census	CEO
ACCRA			0.849	0.840	0.796
BEA					
EPI				0.969	0.899
Census					0.900

Note: BEA housing index values are available by state but not MSA so correlations are not available with the other indices (which are at the metropolitan level).

Table C6 explores the correlations between the health components of the ACCRA, EPI, and BEA RPP indices and the hospital wage index and GPCI. Correlations are provided for indices with common geographic areas. The ACCRA and EPI indices are available for metropolitan areas (not state) and the BEA RPP medical index is only available by state. We have aggregated the county-level GPCI to the state level. The hospital wage index is available by metropolitan area; here it is aggregated it to the state level for comparison with the other state

[30] BEA does not publish the rent component to the RPPs for the metropolitan areas reflected in table C4 but does provide them by state.

indices. When aggregating the hospital wage index and GPCI to the state level, we use the population weighted mean index for the underlying areas. We also examine correlations for an index of personal care spending per capita at the state level based on the national health expenditures produced by the Office of the Actuary at the Center for Medicare and Medicaid Services, since there is no overall index of medical care spending.

Table C6. Comparing Health Index Values (Metropolitan Areas and State)

	ACCRA (health)	EPI (health)	Hospital wage (MSA)	Hospital wage (state)	BEA (med. goods) (state)	BEA (med. services) (state)	BEA (med. average) (state)	GPCI (state)	Personal Health Spending (State)
Number of areas	221	363	366	51	51	51	51	51	51
Minimum	0.801	0.712	0.750	0.803	0.816	0.734	0.867	0.798	0.738
Maximum	1.443	1.390	1.619	1.279	1.285	1.302	1.183	1.425	1.519
Range	0.642	0.678	0.869	0.476	0.469	0.568	0.316	0.579	0.780
Ratio of max. to min.	1.801	1.952	2.159	1.593	1.574	1.774	1.364	1.784	2.057

	ACCRA (health)	EPI (health)	Hospital wage (MSA)	Hospital wage (State)	BEA (medical goods)	BEA (medical services)	BEA (medical average)	GPCI	Personal health spending (state)
ACCRA health care		0.038	0.658						
EPI health care			-0.237						
Hospital wage (MSA)									
Hospital wage (state)					0.620	-0.015	0.545	0.298	0.212
BEA (med. goods)						-0.157	0.798	0.361	0.366
BEA (med. services)							0.470	-0.351	-0.106
BEA (med. average)								0.108	0.262
GPCI									0.227

Note: The indices reflect metropolitan areas except where state is noted. The BEA medical indices are only available at the state level so correlations with other metropolitan area health indices are not available.

As mentioned earlier, ACCRA's health index reflects five items: the average area fees for (1) an optometrist visit, (2) a routine exam by a general practitioner, and (3) a dental visit, and the average costs of (4) Lipitor and (5) Advil. EPI's health budget reflects a weighted average for a given family size of employee premium contributions to employer-sponsored coverage, nongroup premiums, and Medicaid premiums (set to zero), plus average out-of-pocket costs.[31] BEA's RPPs are based on the extensive data on medical goods and services in the CPI. Health insurance expenditures are not included in the RPPs because they are not captured by the CPI survey and must be estimated for the CPI (Aten and Reinsdorf 2010). (As indicated previously, Aten advises caution in use of the individual-item RPPs, as the small number of price quotes in some areas can produce unexpected effects on the results.) The hospital wage index reflects hospital labor costs, and the GPCI reflects geographic variation in the cost of practice for physicians.

Given that the definitions of the indices vary widely, it is perhaps not surprising that these correlations are lower than those shown earlier. There is negligible correlation at the MSA level between the EPI health index and ACCRA (0.038), but higher correlation between the hospital wage index and ACCRA (0.658). The BEA provides separate indices for medical goods and medical services, as well as an average medical index. The medical goods and medical service average indices correlate fairly well with the hospital wage index (0.620 and 0.545, respectively). The medical services index clearly does not measure the same price variation, given the negative correlations shown. BEA reports that the RPPs for medical goods and services behave differently across areas, with the RPP for medical goods being lower in rural areas while RPPs for medical services are similar across rural, micropolitan, and metropolitan areas (Aten et al. 2011). There is little correlation at the state level between the hospital wage index and the GPCI (0.298). The index of personal health care spending at the state level shows low correlations relative to the other health indices. The lack of correlation between the various health indices likely arises from differences in the definition of what is being priced.

Table C7 shows the correlations between the health indices and the more comprehensive indices shown in table C4. The ACCRA health care index shows a reasonable degree of correlation with all comprehensive indices, with the lowest correlation for ACS median family income (0.508). In contrast, the EPI health care index has negligible correlation with the comprehensive indices, showing the highest correlation coefficient with its own comprehensive index (0.193). The hospital wage index is highly correlated with most of the comprehensive indices at the MSA level, with the highest correlation with ACCRA (0.781) and the lowest with

[31] Data are drawn from the Current Population Survey Annual Social and Economic Supplement (CPS-ASEC) and Medical Expenditure Panel Survey. Estimates for the cost of nongroup coverage are obtained from an online quote web site called E-Health Insurance. For example, the formula for two-parent families is (.6918 * employer-sponsored premium) + (.0306 * Medicaid) + (.2776 * nongroup premium) + out-of-pocket costs. Families are assumed to face zero premium cost for Medicaid (Lin and Bernstein 2008b).

EPI (0.573) and ACS median income (0.467). BEA's medical goods index has a marked degree of correlation (0.623) with the BEA comprehensive index, but BEA's medical services index is negligibly correlated with the comprehensive index. The state-level hospital wage index is highly correlated with the BEA RPP (0.769) and with the ACS median income (0.616) and is more highly correlated with these comprehensive indices than the GPCI, which has correlations of 0.460 and 0.286 respectively. Per capita personal health spending at the state level was moderately correlated with these two indices, with correlations of 0.408 and 0.476.

Table C7. Comparing Health to Composite Index Values (Metropolitan Area and State)

	ACCRA	BEA RPPs	EPI (2 parent 2 child)	Census SPM rent index	CEO	ACS median family income (family of 4)	BLS pay relatives (all)	BLS pay relatives (services)
Number of areas	221	366 (MSA), 51 (state)	363	258	366	366 (MSA), 51 (state)	77	77
Minimum	0.843	0.786	0.798	0.607	0.855	0.538	0.790	0.800
Maximum	1.663	1.243	1.426	1.716	1.347	1.693	1.200	1.250
Range	0.820	0.457	0.628	1.109	0.492	1.155	0.410	0.450
Ratio of max. to min.	1.973	1.582	1.787	2.825	1.575	3.148	1.519	1.563

	ACCRA	BEA	EPI	Census	CEO	ACS	BLS (all)	BLS (services)
ACCRA health care	0.625	0.615	0.633	0.638	0.680	0.508	0.712	0.676
EPI health care	-0.058	0.045	0.193	-0.010	0.011	0.026	-0.209	-0.235
Hospital wage (MSA)	0.781	0.768	0.573	0.752	0.763	0.467	0.827	0.833
Hospital wage (state)		0.769				0.616		
BEA (med. goods) (state)		0.623				0.550		
BEA (med. services) (state)		-0.040				0.012		
BEA (med. average) (state)		0.533				0.499		
GPCI (state)		0.460				0.286		
Personal health (state)		0.408				0.476		

Note: The indices reflect metropolitan areas except where state is noted. BEA has both state and metropolitan composite indices. The state composite BEA index is used for comparing with the state hospital wage and GPCI indices.

V. Cost-of-Living Variation in Insular Areas and Relevance to Program Eligibility

The insular areas (U.S. territories) include the Commonwealth of Puerto Rico, Guam, the Virgin Islands, the Commonwealth of the Northern Mariana Islands, and American Samoa. In 2010, 4,100,954 individuals lived in the territories; Puerto Rico accounted for 90.1 percent of these individuals.[32] With the exception of Guam, median household income in the territories is substantially less than income in the mainland, ranging from 34 percent of the U.S. median in Puerto Rico to 60 percent in the Virgin Islands and 93 percent in Guam.[33]

Most social welfare programs available in the 50 states and the District of Columbia are also available in the territories; any changes to account for variation in cost of living could affect program eligibility. However, income eligibility determination for benefits may differ from standards used on the mainland, depending on the program and the territory. SNAP operates in the Virgin Islands and Guam, but special grant programs operate in Puerto Rico, the Northern Marianas, and America Samoa. Medicaid and the CCDF are grant-in-aid programs by which the federal government helps finance benefits and services in the territories if the territory chooses to participate. All territories have Medicaid and CHIP programs and are included in the ACA.

One project informant asked whether the rationale behind converting the SNAP program to a fixed grant in Puerto Rico in 1982 related to differences in the cost of living there. The change was designed to limit costs of benefits in Puerto Rico and to give Puerto Rico more authority to administer the program.[34] Food stamp benefit costs were considerably higher in Puerto Rico than in the mainland states before this change; 56 percent of residents were receiving benefits. The initial block grant was set at $825 million (about 75 percent of expected expenditures for 1982), and the block grant has been indexed with inflation since 1986.

In 2009, Puerto Rico's Nutrition Assistance Program (NAP), which replaced food stamps, was providing nutrition assistance to about 30 percent of the population. Puerto Rico sets income eligibility limits and benefits to bring the program costs in line with reduced funding. In 2009, for example, the net income screen for NAP was $193 a month for an individual and $389 for a two-person household, compared with $867 and $1,167 in the continental United States (Peterson et al. 2010). NAP uses more generous income exemptions and deductions than those in SNAP. Benefit amounts are not established relative to the Thrifty Food Plan; rather, the benefit is calculated based on the number of participants and the size of the block grant. (A minimum NAP benefit was $55 a month in 2009.)

[32] U.S. Census Bureau, data from the 2010 Census. Specifically, the population in American Samoa was 55,519; Guam, 159,358; Northern Marianas, 53,883; and Virgin Islands, 106,405.
[33] GAO (2006) household income data represent 2000. The 2010 income data for all territories are not yet available from the 2010 Census.
[34] The history of this conversion is described in Peterson et al. (2010).

Poverty Thresholds and Guidelines in the Insular Areas

Census uses the same poverty thresholds for insular areas in measuring poverty as for states. The ACS has been fielded in Puerto Rico since 2005; annual poverty estimates are available for the most populous insular area. The poverty rate in Puerto Rico was 45 percent in 2010, compared with 15 percent in the United States (U.S. Census Bureau 2011). Poverty rates in 2000 (the latest data available) for the other territories were 61 percent in American Samoa, 23 percent in Guam, 46 percent in the Northern Marianas, and 32 percent in the Virgin Islands. The annual Current Population Survey (CPS), which has been the focus of the Census Bureau's work on alternative poverty measurement, does not cover the insular areas. Consequently, this topic has not received attention in the SPM literature.

HHS does *not* issue guidelines for the insular areas. Instead, for most programs using poverty guidelines that serve insular areas, the federal office that administers the program is responsible for deciding whether to use the contiguous states and D.C. guidelines or follow some other procedure. A recent GAO report (GAO 2009a) investigated the potential for adjusting poverty guidelines in the insular areas. The report noted that the U.S. Office of Personnel Management's nonforeign-area cost-of-living adjustments (COLAs) could be used for each of the insular areas except for American Samoa (where nonforeign-area COLAs are not available). The nonforeign-area COLAs reflect the difference in prices for more than 300 items, including goods and services, housing, transportation, and miscellaneous expenses, and are paid to white-collar civilian federal employees working in Alaska, Hawaii, and the covered insular areas to reflect higher rates in these areas.[35]

HHS/ASPE and the Census Bureau submitted comments to the GAO report. HHS/ASPE stated that the nonforeign-area COLAs were of insufficient statistical quality to adjust the poverty guidelines, citing evidence that they had not been considered as an approach in prior geographic-adjustment studies. HHS/ASPE outlined two alternative methods: (1) setting the guideline as a percentage of median family income, and (2) setting the guideline based on the responsiveness of poverty threshold to changes in inflation-adjusted income over time. Both these methods would reduce poverty guidelines in the insular areas, although HHS/ASPE states that it does not advocate lowering guidelines in these areas. The Census Bureau suggested that GAO consider comparing the nonforeign COLAs for insular areas to the housing-cost differentials from the ACS, the census, and HUD fair market rents. GAO responded that the nonforeign-area COLAs include a housing component that is adjusted for differences in housing quality, and also incorporates other expenditures. Comments from all three agencies indicated that there is no consensus on how guidelines could be set for the territories.

[35] See http://www.opm.gov/oca/cola/index.asp.

What Do We Know about Variation in Cost of Living?

For the most part, the geographic cost-of-living indices discussed in this report do not include the insular areas. Some work has been done to capture variation in prices using fair market rents to capture housing costs, and there are some data on wage differentials in insular areas.

The 2000 decennial census serves as the base for HUD FMRs for Puerto Rico, Guam, Northern Marianas, American Samoa, and the U.S. Virgin Islands. With the exception of Puerto Rico, the ACS is not fielded in the insular areas; these areas received the long form of the 2010 decennial census.[36] The decennial census data will become available in 2012 and will be used to update the FMRs. Puerto Rico participates in a customized version of the ACS called the Puerto Rico Community Survey. Although the 2005 to 2009 Puerto Rico Community Survey data are available, the data were not used to develop FMRs because they were insufficient to eliminate units that did not meet HUD standards. Therefore, HUD used data on the change in all rents for all of Puerto Rico to update the prior FMRs (HUD 2012).

Data from the decennial census or Puerto Rico ACS could be used to develop income-based indices for adjusting the national poverty guidelines. However, the Puerto Rico ACS data should be used with caution since their quality is not as high as it is for the United States. Puerto Rico has a high rate of inaccurate addresses, and mail response rates lag about 25 percentage points behind those for the United States. The low rate of response by mail and phone results in a low rate of completed interviews and impacts the reliability of survey estimates for Puerto Rico (U.S. Census Bureau 2012). Also, a few items (yearly mobile home costs, property value, year built, and year last married) have particularly high levels of item nonresponse. To our knowledge, the quality of 2010 decennial census data for the other insular areas is not yet known.

The OES provides occupational wage data for Guam, Puerto Rico, and the Virgin Islands. However, American Samoa and the Northern Marianas are not included in the OES, and none of the insular areas are included in the pay relatives. Wage data for Puerto Rico and the Virgin Islands are available through the Quarterly Census of Employment and Wages (QCEW). The QCEW was used to develop a geographic index in GAO's analysis of changes to the funding formula for Vocational Rehabilitation Services (GAO 2009c) and so could be explored as a possible data source. An additional area for exploration is the purchasing power parities (PPPs) developed for international comparisons of GDP. PPPs are available for American Samoa, Guam, Puerto Rico, and the Virgin Islands.[37] The PPPs are expressed in billions of dollars of GDP, and further investigation is required to determine whether they reflect differences in the cost of living faced by low-income families and can be used to develop poverty guidelines specific to these areas.

[36] With the introduction of the ACS, the long form of the decennial census was eliminated in the United States and Puerto Rico. The long form includes questions about income and housing characteristics that are not included in the short form.

[37] PPPs are available at http://www.pdwb.de/archiv/cia/ciabip00.htm.

Federal Health Programs in the Insular Areas

Medicaid and CHIP operate differently in insular areas along a number of dimensions. As noted above, Medicaid is not an entitlement as it is for those residing in states, and federal expenditures are capped for each area. Federal matching rates are set at the lowest rate faced by states—50 percent for Medicaid and 65 percent for CHIP. The insular areas have broader authority than do states to determine eligibility under Medicaid. American Samoa and Guam use the federal poverty guidelines to determine eligibility for Medicaid and CHIP, but Puerto Rico uses a percentage of the commonwealth poverty level, the U.S. Virgin Islands uses local income levels, and the Mariana Islands use a percentage of the Supplemental Security Income income threshold. Insular areas have made broadly different choices for Medicaid eligibility: only 6 percent of the population is covered by Medicaid and CHIP in the U.S. Virgin Islands and 88 percent in American Samoa (GAO 2009d). Under the ACA, the allotments given to the insular areas increase and the federal medical assistance percentages for Medicaid will increase from 50 to 55 percent.

Medicare program eligibility is the same in the insular areas as in the states, and physicians are reimbursed based on a similar payment mechanism that includes adjustment by the GPCI. However, Medicaid subsidies for part D coverage are not provided as a direct subsidy to low-income individuals, but rather are given to each area as an allotment to be allocated as deemed appropriate. In addition, hospital reimbursement under Medicare is different in the insular areas than in the states. Hospitals in the insular areas, Puerto Rico excluded, are not reimbursed based on the inpatient prospective payment system (IPPS). In Guam and the U.S. Virgin Islands, hospitals are reimbursed based on the lesser of average costs or a specified targeted amount that increases over time. Hospitals in American Samoa are reimbursed based on average cost but are not subject to caps on costs or a national cap on spending. In Puerto Rico, hospitals are reimbursed under the IPPS but using a blended rate based on 75 percent of the national average and 25 percent on local cost components. These payments are further adjusted at the hospital level based on national and local factors (GAO 2005).

VI. Summary and Implications

This review of the available indices suggests several current alternatives for adjusting the poverty guidelines for the 50 states and the District of Columbia. The various approaches have pros and cons. It is unclear whether the science behind each index is advanced sufficiently to use any to adjust the poverty guidelines, so that program eligibility is affected across the country and the insular areas. The motivation for this assessment is a congressional request to examine the feasibility and implication of adjusting the federal poverty guidelines to reflect variations in cost of living among areas across the United States and the territories when applied to estimate eligibility for benefits under the Affordable Care Act. Given the potential implications for other federal benefit programs, the department extended this assessment to include implications for

SNAP and CCDF. Nonetheless, the importance of reflecting differences in health care costs across geographic areas must be considered. Given that any index would be used to adjust poverty guidelines, consideration of relevance to low-income populations must also be given high priority. A few prior studies have used existing indices to adjust the poverty guidelines and assess the implications for federal benefit programs. Since lessons from these studies may be relevant in considering alternatives to adjust the guidelines, they are summarized.

Summarizing the Indices

Three indices (BEA, CEO, and EPI) provide comprehensive cost-of-living estimates for all metropolitan areas and the nonmetropolitan area of each state, and a fourth (the Census Bureau's SPM geographic adjustment) reflects median rents and is highly correlated with the comprehensive indices.

The BEA RPPs show promise because they will be updated annually for rolling periods reflecting five years of recent data and will be released as official estimates. Although they do not currently include RPPs for nonmetropolitan areas, these will be included in the release of the 2006–10 estimates. Also, the BEA RPPs reflect all consumers, not a particular income class. To the extent that lower-income consumers face different prices, some will question their use as adjustments for the poverty guidelines.

Like the BEA, the CEO model uses hedonic regressions to isolate the geographic effect on prices. The CEO uses ACCRA instead of CPI data for the nonhousing portion of the index because CPI data are not publicly available. The ACCRA data reflect spending for higher-income individuals, although some argue that the data correlate well with costs for individuals at all income levels. CEO takes considerable effort to incorporate neighborhood quality in its housing index. The data used to build the index represent 2000 and are projected forward using BLS time-series data. CEO modifies the ACCRA index to use expenditure weights for all consumers rather than for the upper quintile. However, ACCRA prices are collected from the places that upper-quintile families shop and so may continue to reflect the upper income quintile to some degree.

The EPI family budget provides the most geographically extensive recent source for a family budget approach. Limitations include the fact that the estimates are not produced annually, and some components are extrapolated from earlier years. The budgets are produced for families with children, with different budgets by the number of adults and children, and measure the income at which families can maintain a safe but modest standard of living. A potential limitation of a family budget approach is that it assumes a fixed set of consumption items rather than capturing consumption patterns reflected in CEO and BEA estimates through the CPI expenditure weights. For example, all families are assumed to require child care, and the medical care portion of the index reflects a weighted average under the assumption that all families will have employer-sponsored coverage, nongroup coverage, or Medicaid. The EPI

family budgets also include federal and state income taxes, although these could be subtracted from the measure if deemed appropriate when adjusting poverty guidelines.

The Census Bureau's SPM median rent index, developed for use with the supplemental poverty measure, reflects rent at the median and is straightforward to develop and explain. Panelists at the UKCPR/Census/Brookings meeting called for using hedonic regression techniques to control for quality differences, and the Census Bureau intends to pursue their recommendations in future research (Renwick 2011b). It is worth noting, however, that the Census Bureau found a high degree of correlation (0.98) between the median rent index and the housing portion of BEA's index (produced through hedonic regression).

Other indices have various shortfalls. While BLS pay relatives are of potential interest because they isolate the geographic effect on wage differences, they are only produced for 77 metropolitan areas, and their funding was eliminated with the 2011 federal budget.[38] The locality pay differences for federal employees are either derived in part from the pay relatives or are developed with feedback from unions. The self-sufficiency standard is another example of a family budget approach, but it does not cover all states and varies in the year of each standard's coverage. Median family income is used as an eligibility limit in CCDF, but our analysis shows that it has low correlation with the other cost-of-living measures. The housing and transportation index reflects the combined costs of housing and transportation. However, the index currently reflects only metropolitan and micropolitan areas. Given that HUD has recently awarded a contract for developing a national housing and transportation index, this index may have potential for future use. Finally, individual indices such as those for food, transportation, or medical care are of lesser interest due to their small share of the family budget.

There is no comprehensive index that considers geographic variation in medical care and includes expenditures made by consumers, as well as by employers and public programs such as Medicaid and Medicare. The CE and the CPI rely exclusively on estimates of consumer expenditures and incorporate geographic variation in the extent and quality of employer-sponsored and Medicaid coverage. These data underlie the health component of the BLS RPP. This concept, although applied differently, is also the basis for constructing the health component of the EPI family budget. Constructing an out-of-pocket index using new data on medical out-of-pocket costs for the CPS would also be consistent with this approach. Importantly, the expansion in coverage under the ACA will likely significantly change the results of such indices.

Both ACCRA and the Milliman GHS take a different approach to geographic variation in health care costs. Each prices a bundle of health care services across geographic areas. They

[38] The BLS OES provides data on occupational wage levels for a comprehensive set of geographic areas (including insular areas). However, these data do not control for differences in the mix of levels within an occupation or for other factors (other than geography) that might explain differences between areas.

differ in that ACCRA's reliance on a set package of services does not incorporate variation in patterns of utilization across areas. These indices measure a fundamentally different concept that those measuring consumer expenditures.

Finally, the Medicare program uses yet another model, input prices, to adjust payments to physicians and hospitals for geographic variation in the cost of providing care. Surprisingly, at the state level the GPCI and the hospital wage index are not highly correlated. These indices are currently the focus of an IOM panel aimed at improving their accuracy.

Other Studies That Have Applied Cost Variation to Estimate Program Eligibility

A few other studies have estimated how adjusting the poverty guidelines for variation in cost of living might affect program eligibility. For example, Curran and associates (2008) used ACCRA data to adjust the poverty guidelines and showed the effect on poverty and eligibility for Head Start, Early Head Start, and the school lunch program. They applied the 2000 ACCRA cost-of-living index to 98 central cities in metropolitan and primary MSAs across the country,[39] using regression equations to estimate cost of living for areas not available. Their results showed large shifts in poverty and in program eligibility—higher in northeastern and western areas with higher costs of living and lower in the south and midwest.

Census Bureau researchers Nelson and Short (2003) estimated the effect of adjusting poverty thresholds for geographic variation in cost of living on the allocation of funds for CHIP (part of which depends on the number of children in families with incomes under 200 percent of the federal poverty threshold). They find that adjustment to the poverty thresholds would reallocate substantial funding from the southeast to the northeast and west.

A GAO report (GAO 2009b) examined the potential effect of adjusting the Pell Grant aid formula for cost-of-living differences. The report indicated that a small cost-of-living difference was already included: state and other taxes are included in the eligibility formula and the cost of attendance (and hence the grant) is likely higher in higher cost-of-living areas. The authors tested the effects of adjusting the eligibility formula using HUD FMRs, BEA RPPs, and annual housing expenditures from the CE. The annual housing expenditure index is developed by the College Board to calculate financial aid but is only available for 28 major metropolitan areas. The analysis showed that all three COLAs would increase aid to students in high-cost metropolitan areas, particularly in California and the northeast. However, COLAs would not increase Pell spending substantially because many recipients already receive the maximum grant or do not live in a high-cost area. Universal implementation would lower overall spending under the HUD FMR and BEA RPPs, because more students would experience a decrease rather than an increase.

[39] The authors note that the set of urbanized areas for which cost-of-living indices are available varies every quarter because participation in ACCRA is voluntary. So ACCRA data are inconsistent and often unavailable for specific urbanized areas.

Another GAO report (GAO 2009c) considered possible changes to the vocational rehabilitation funding formula. One option considered was to include the costs of providing services when determining the state grant. To do so, the study's authors developed an index reflecting the cost of inputs (wages, rents, and other). The BLS QCEW (which supplies data on wages by industry) and the BLS OES (which supplies wages by occupation) were considered as sources for wage data. After GAO learned of data anomalies at the narrowest categories of industry (vocational rehabilitation services) and occupation (vocational rehabilitation counselors), they selected the broad QCEW category of education, health care, and social assistance. Wage indices from Medicare's prospective payment system were also considered, but the QCEW was reflected to present the broad range of services provided. FMRs were used as a proxy for office rent. The report does not present the effects of geographic adjustment separately from other changes to the formula.

Also, Cashell (2007) wrote a review paper for the Congressional Research Service considering how federal benefits could be adjusted for nationwide differences in cost of living. Noting the wide use of the ACCRA indices, Cashell uses the ACCRA data to demonstrate considerable variation in cost of living across the country. He notes that the greatest portion is attributable to differences in the cost of housing. No recommendations were made in this paper.

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