

# SHADAC’s Coverage Hierarchy for American Community Survey (ACS) Estimates on State Health Compare

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## Summary

In this brief SHADAC defines a “primary source of coverage hierarchy,” and details how and when researchers can use this tool to determine which payer is primary when an individual reports multiple sources of health insurance coverage on a survey.

## Introduction

Health insurance coverage does not always come from just a single source. Individuals sometimes purchase multiple insurance policies and/or are enrolled in multiple coverage types. For example, some elderly and disabled persons are eligible for and enrolled in both Medicare and Medicaid (referred to as “dual eligibles”). Another common example occurs when individuals who are enrolled in Medicare also purchase “Medigap” plans to cover the out-of-pocket (OOP) expenses that are not paid for by Medicare. To account for cases like these, most surveys that collect information on health insurance allow respondents to report multiple sources of health insurance coverage. In both examples described above, a respondent would correctly report two forms of insurance—in the first scenario, the individual would report having Medicare and Medicaid, and in the second example, the individual would report having both Medicare and direct purchase insurance. According to data from the American Community Survey (ACS), 16.9 percent of individuals with coverage reported having multiple sources of insurance in 2017 (Table 1).

In most cases, individuals with multiple sources of insurance have one source that serves as the primary payer, and it is often useful to have a method for identifying this primary source for the purposes of survey research. A common method is to use a “primary source of coverage hierarchy.” Using this approach, individuals reporting multiple types of health insurance are assigned to a single primary source, thereby creating mutually exclusive insurance source categories. Creating this kind of hierarchy can give a more accurate picture of the distribution of different types of

coverage across a population. In addition, a hierarchical approach can be used to address issues such as the known over-reporting of direct purchase coverage in some surveys.<sup>1</sup> Finally, a coverage hierarchy ensures that respondents are only counted once in estimates of the distribution of coverage, guaranteeing that the distribution of coverage types sums to 100 percent.

Using a primary source of coverage hierarchy is a common practice throughout health economics and health services research literature.<sup>2,3,4</sup> Researchers typically use a hierarchy to ensure that individuals who report having multiple types of coverage are only counted once, to reduce the rate of over-reporting multiple sources of coverage and to make coverage estimates more comparable across different surveys.<sup>5</sup> The order of coverage used in these hierarchies varies widely based on the research focus, data source, and requirements of the analysis. In the following analysis, our focus is on the hierarchy that SHADAC uses to produce ACS coverage estimates on its [State Health Compare](#) web tool.

**Table 1. Health Insurance Coverage Estimates by Age Group, ACS 2017**

Sources of Coverage	Age 0-18	Age 19-64	Age 65+	All Ages
1 Source of Insurance Coverage	94.4%	92.9%	32.1%	83.1%
Multiple Sources of Insurance Coverage	5.6%	7.1%	68.0%	16.9%
2 Sources of coverage	5.4%	6.5%	54.5%	14.3%
3+ Sources of coverage	0.2%	0.6%	13.5%	2.6%

Note: All estimates are for the noninstitutionalized population. Does not include individuals who reported having no health insurance coverage. Source: SHADAC analysis of the 2017 American Community Survey (ACS) Public Use Microdata Sample (PUMS) file.

## SHADAC's Coverage Hierarchy and the ACS

SHADAC routinely imposes a primary source of coverage hierarchy when reporting national, state, and sub-state estimates of health insurance coverage. The goal of SHADAC's coverage hierarchy is to identify survey respondents who report multiple sources of health insurance in the American Community Survey and determine which source is likely to be (a) a comprehensive health insurance plan that (b) serves as the respondent's primary payer (i.e., the insurance plan that pays first).

Table 2 shows the hierarchical order in which survey respondents who report multiple types of coverage are sorted into one insurance type—creating a mutually exclusive category. SHADAC's ACS coverage hierarchy is defined separately for respondents under age 19 and respondents 19 years of age or older based on the rules governing Medicare coverage.

**Table 2. SHADAC Primary Source of Coverage Hierarchy on State Health Compare, ACS 2017**

Age 19 or older		Age 0-18
1	Medicare	Employer/Military (TRICARE, VA)
2	Employer/Military (TRICARE, VA)	Medicaid/CHIP
3	Medicaid/CHIP	Direct purchase
4	Direct purchase	Medicare
5	Uninsured	Uninsured

**1. Medicare** - Children (age 0-18) generally are only eligible for Medicare if they have End-Stage Renal Disease.<sup>6</sup> For adult respondents (age 19 or older), Medicare is considered the primary coverage source, so any adult respondent who reported Medicare in combination with any other source(s) is assigned to Medicare. This is because Medicare is the primary payer for covered medical services for those with Medicare and Medigap plans (reported as direct purchase), for Medicare-Medicaid dual enrollees, and for those with Medicare and employer coverage through retiree health plans or, in some cases, for the working elderly.<sup>7</sup>

**2. Employer/Military** - Anyone not reporting Medicare but reporting Employer or Military coverage, including TRICARE and Veterans Administration (VA), is assigned to Employer/Military.

**3. Medicaid/CHIP** - Anyone reporting Medicaid or CHIP (but not Medicare or Employer/Military) is assigned as Medicaid/CHIP. (Medicaid is generally the last-resort payer and, in most cases, all other sources of coverage must pay claims before Medicaid.)<sup>8</sup>

**4. Direct purchase** - This is the last coverage in the hierarchy (also called "nongroup" or "individual market coverage"), and this is only assigned to respondents who don't report any other coverage type (Medicare, Employer/Military, or Medicaid/CHIP). Direct purchase is assigned last because this is typically the least generous coverage and there is evidence in the ACS and in some other surveys of mis- and/or over-reporting of this health insurance type.<sup>9,10</sup>

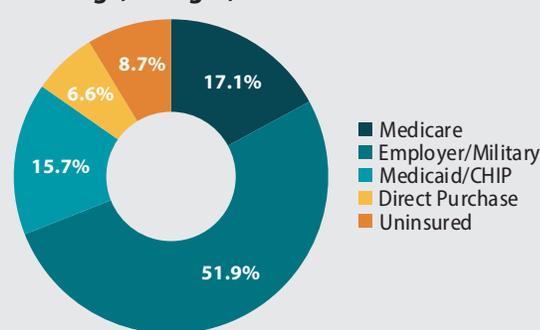
**5. Uninsured** - Because the hierarchy only assigns a source of coverage to those who report multiple sources, the methodology does not impact the rate of uninsurance as there is no source of coverage in this instance.

## Impact of Using SHADAC's Primary Source of Coverage Hierarchy on Coverage Estimates in the ACS

Figure 1 shows how the SHADAC coverage hierarchy allocates respondents reporting multiple sources of coverage to one coverage type, creating five mutually exclusive categories that sum to 100 percent. Table 3 shows the impact of reallocation in more detail. The largest change to the overall distribution occurs among the elderly (age 65 or older), 68.0 percent of whom report having multiple sources of coverage (Table 1).

Among coverage types, applying a hierarchy has the largest impact on rates of direct purchase, bringing these estimates closer in line with those from administrative data.<sup>11</sup> The effect is largest among those 65 and older (30.8 percentage-point decrease), as respondents in this group are most likely to report having supplemental coverage from an employer, direct purchase, or Medicaid.<sup>12</sup> Applying a hierarchy also leads to decreases in rates of direct purchase coverage among the 19-64 and 0-18 age groups (-2.8 percentage points and -1.8 percentage points, respectively).

**Figure 1. Primary Source of Health Insurance Coverage, All Ages, 2017**



Applying a hierarchy also has a large effect on the rate of Employer/Military coverage, but this impact is primarily seen for those 65 and older, who experience a 37.1 percentage-point decrease. Applying a hierarchy has a smaller effect on rates of employer coverage among those age 19-64 (0.8 percentage-point decrease) and no effect among those age 0-18, as employer coverage is first in the hierarchy for this age group.

The hierarchy has a moderate impact on rates of Medicaid/CHIP coverage overall, and this decrease is again largest among those age 65 or older (-13.8 percentage points). After applying the hierarchy, the rate of Medicaid coverage for this group is zero percent, as all respondents with Medicaid coverage also have Medicare coverage. The hierarchy also has a moderate impact on rates of Medicaid coverage among the age 19-64 group (3.1 percentage-point decrease), with 58.0 percent of the decrease attributed to those dually eligible for Medicare and Medicaid and 42.0 percent of the decrease attributed to those reporting both employer coverage and Medicaid. There is also a modest decrease in Medicaid coverage among the age 0-18 group (-3.4 percentage points), attributed to respondents reporting employer and Medicaid coverage.

Because Medicare is first in the hierarchy applied to those age 19 and over, there are no changes in rates of Medicare coverage among these groups. Only a 0.3 percentage-point decrease in rates of Medicare is seen among those age 0-18, and just a 0.1 percentage-point decrease occurs among all ages.

**Table 3. Health Insurance Coverage Estimates by Age Group, Hierarchy vs. No Hierarchy**

Coverage Type	Hierarchy		No Hierarchy		Difference	
	Percent	Count	Percent	Count	Pct. Point	Count
<b>Age 0-18</b>						
Medicare	0.3%	217,039	0.6%	500,887	-0.3	-283,848
Employer/Military	54.1%	42,196,590	54.1%	42,196,590	0.0	0
Medicaid/CHIP	35.1%	27,411,663	38.5%	29,994,070	-3.4	-2,582,407
Direct Purchase	5.5%	4,266,235	7.3%	5,729,898	-1.8	-1,463,663
Uninsured	5.0%	3,907,218	5.0%	3,907,218	0.0	0
<b>Total</b>	<b>100.0%</b>	<b>77,998,745</b>	<b>105.5%</b>	<b>82,328,663</b>	<b>-5.5</b>	<b>-4,329,918</b>
<b>Age 19-64</b>						
Medicare	3.9%	7,526,449	3.9%	7,526,449	0.0	0
Employer/Military	63.5%	123,432,612	64.3%	124,984,369	-0.8	-1,551,757
Medicaid/CHIP	11.9%	23,044,853	15.0%	29,173,784	-3.1	-6,128,931
Direct Purchase	8.6%	16,653,588	11.4%	22,222,704	-2.8	-5,569,116
Uninsured	12.2%	23,681,938	12.2%	23,681,938	0.0	0
<b>Total</b>	<b>100.0%</b>	<b>194,339,440</b>	<b>106.8%</b>	<b>207,589,244</b>	<b>-6.8</b>	<b>-13,249,804</b>
<b>Age 65+</b>						
Medicare	95.9%	47,432,240	95.9%	47,432,240	0.0	0
Employer/Military	2.9%	1,434,219	40.0%	19,804,447	-37.1	-18,370,228
Medicaid/CHIP	0.0%	0	13.8%	6,828,409	-13.8	-6,828,409
Direct Purchase	0.5%	234,765	31.3%	15,501,277	-30.8	-15,266,512
Uninsured	0.8%	384,329	0.8%	384,329	0.0	0
<b>Total</b>	<b>100.0%</b>	<b>49,485,553</b>	<b>181.8%</b>	<b>89,950,702</b>	<b>-81.8</b>	<b>-40,465,149</b>
<b>All Ages</b>						
Medicare	17.1%	55,175,728	17.2%	55,459,576	-0.1	-283,848
Employer/Military	51.9%	167,063,421	58.1%	186,985,406	-6.2	-19,921,985
Medicaid/CHIP	15.7%	50,456,516	20.5%	65,996,263	-4.8	-15,539,747
Direct Purchase	6.6%	21,154,588	13.5%	43,453,879	-6.9	-22,299,291
Uninsured	8.7%	27,973,485	8.7%	27,973,485	0.0	0
<b>Total</b>	<b>100.0%</b>	<b>321,823,738</b>	<b>118.0%</b>	<b>379,868,609</b>	<b>-18.0</b>	<b>-58,044,871</b>

Note: All estimates are for the noninstitutionalized population.

Source: SHADAC analysis of the 2017 American Community Survey (ACS) Public Use Microdata Sample (PUMS) file.

## Using an Insurance Coverage Hierarchy

Using a coverage hierarchy may not be appropriate for all types of analysis. For instance, a hierarchy should not be used when a study seeks to examine individuals who have multiple sources of insurance coverage (e.g., dual-eligible beneficiaries of Medicare and Medicaid), since a hierarchy by definition assigns individuals to just one type of coverage.

A hierarchy also may not be appropriate when looking at respondents with a specific source of coverage when the status of that type of coverage as primary versus supplementary is not relevant to the analysis. Applying a hierarchy in this case may inappropriately exclude respondents with that type of coverage.

It's also important to note that no single hierarchy will be appropriate for every analysis. Rather, analysts can and should alter the priority of coverage types in the hierarchy according to their specific research question. For example, a study focusing on changes in the rates of public coverage over time would likely put public coverage types first in the hierarchy before forms of private coverage such as employer-sponsored or direct purchase coverage.

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