



Medicaid Access Technical Assistance Brief

August 2018 • Brief 2

Joe Zickafoose, Allison Dodd, and Deborah Chollet

Strategies to compare access to care among Medicaid beneficiaries versus other populations

This brief presents statistical methods that staff in state Medicaid agencies could use to assess how well their Medicaid program is meeting the goal of access to care for Medicaid beneficiaries that is comparable to that for populations with other sources of coverage. The brief discusses the advantages and challenges of different methods and provides examples of the potential application of the methods within the context of monitoring access for Medicaid enrollees.

A. Introduction

The Social Security Act requires that the care and services provided by Medicaid be available “at least to the extent that such care and services are available to the general population in the geographic area” (Section §1902(a)(30)(A) of the Social Security Act). This brief discusses statistical strategies that state Medicaid agencies can use to assess whether access to Medicaid services in their state meets that requirement by making comparisons between Medicaid beneficiaries and populations with other sources of coverage, most commonly Medicare and commercial insurance.

For each strategy, we discuss its suitability for various types of analyses, its strengths and limitations, and examples and resources that state Medicaid staff can use to help implement the strategy. The target audience for this information includes state Medicaid staff who produce analyses for AMRPs and the senior staff who supervise and act on these analyses.

About this series: The Medicaid Access Technical Assistance brief series is intended to serve as a resource to state Medicaid agencies by providing options and strategies for completing their access monitoring review plans (AMRPs). In November 2015, CMS released a final rule directing states to use a data-driven approach to examine access for beneficiaries in fee-for-service (FFS) Medicaid (Methods for Assuring Access to Covered Medicaid Services, CMS-2328-FC). The final rule requires that, starting in October 2016 and every three years thereafter, states submit an AMRP to report data on access to care, and compare their Medicaid rates with rates paid by Medicare and private payers (commercial insurers) for services that are covered on a FFS basis.

One of the greatest challenges to states in comparing access is identifying sources of data that include (1) both Medicaid beneficiaries and people with other forms of health care coverage and (2) comparable measures—that is, measures that are equally appropriate for both populations. To ensure that measures of access are comparable, states may need to be able to select populations that have similar characteristics or to control for those characteristics—such as demographics, place of residence, health status, or specific health conditions. This brief provides a few examples of data sources that

can accommodate these data needs, but states will need to consult other resources for a more comprehensive listing of data resources.

B. Choosing a method for comparing access to care

There is typically more than one way to compare access to care between populations, and both statistical and practical considerations often guide the selection of the method.¹

These considerations include the following:

- *The type of measure of access (dependent variable).* Do the available data contain a continuous measure (such as the number of potentially avoidable visits to the emergency department) or a categorical measure (such as any potentially avoidable visits to the emergency department)?
- *Whether to adjust for other factors that could affect the result (independent or control variables).* Will the available data allow you to control for factors other than insurance type—such as living in a rural versus an urban area—that could affect access?
- *Whether the analysis occurs at a single point in time (cross-sectional) or at multiple points in time (longitudinal).* Are data for the measure gathered frequently, such as every quarter, or infrequently, such as once every two years?

What are the best ways to compare access based on the type of measure variable?

A range of methods can be used to compare populations based on whether the measure variable is continuous, categorical (including binary—or dichotomous—variables), or ordinal (also known as ordered categorical) (Table 1).

Should the analysis adjust for factors other than insurance type that could affect access?

Various factors outside the control of the Medicaid program can confound your results and affect your interpretation. For example, low socioeconomic status or residence in an area with poor access to primary care could increase Medicaid beneficiaries' use of the emergency department compared to other populations.

Controlling for these factors makes it simpler to interpret results, but whether you can control for them depends on whether the appropriate data are available. If data are available, you can use a multivariate method to generate your results. Such a method will produce results that are more likely to reflect the true difference in access associated with the type of insurance a person has—rather than the difference related to confounding factors.

Are data for the access measure available for multiple points in time?

The number of points in time for which data on the measure are available is a key consideration

Table 1. Examples of types of access measures and corresponding statistical methods

Measure	AMRP domain ^a	Potential data source	Type of variable	Examples of statistical tests and models to compare coverage groups
Rate of potentially avoidable visits to the emergency department	Utilization	All-payer claims database	Continuous (number of visits per number of people)	t-test, analysis of variance (ANOVA), regression analysis
Share of providers accepting new patients with Medicaid versus patients with other health coverage	Availability of care	Provider survey	Categorical (binary, accepts or does not accept)	Chi-square, logistic regression
Share of beneficiaries with unmet health care needs	Beneficiary needs	General population health survey	Ordinal (zero, one, more than one)	Chi-square, ordered logistic regression

^a For the AMRPs, states are required to include measures of access to care in three domains: (1) enroll health needs and whether they are adequately met, (2) the availability of care and providers, and (3) changes in beneficiaries' use of covered services over time.

ADVANTAGES AND CHALLENGES OF USING CROSS-SECTIONAL ANALYSES IN AMRPS

Advantages

- Many staff will be familiar with these statistical tests
- Relatively easy to implement
- Can adjust for differences in individual and community characteristics, if those data are available (multivariable analysis)

Challenges

- Cannot determine the causes of any differences observed
- Cannot assess whether any observed differences in access are changing over time
- Multivariable analysis requires more advanced training and experience

when choosing a method of analysis. Data from several time points can give a sense of whether a difference in access is part of a larger trend—or just a one-time random variation. The following sections discuss ways to make comparisons when data are available at a single or multiple points in time.

C. Comparing access at a single point in time

Many states have access to data that can be used to compare access among Medicaid beneficiaries versus other people at a single point in time. For example, this type of data can be drawn from traditional clinician² and general population health surveys,³ as well as from less common approaches such as secret-shopper surveys.⁴ Because these data are obtained infrequently (yearly or less often), their use is often limited to cross-sectional analyses at a single time point.

Definition. A cross-sectional analysis compares values of the same measure for two distinct populations at a single point in time. The specific statistical test chosen depends on the type of variable used to measure access (Table 1).⁵

Resources for implementation. To conduct a cross-sectional analysis, analysts can choose from among many statistical software options such as

SAS, SPSS, Stata, and R.⁶⁻⁹ Microsoft Excel also has a data-analysis function that can support cross-sectional analyses.

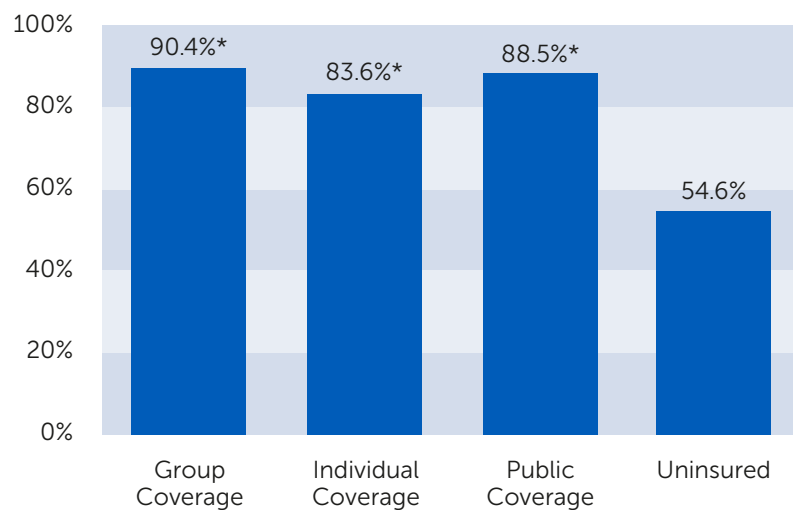
Example of a cross-sectional comparison.¹⁰

Figure 1 shows results from a household survey that asked respondents whether they had a usual source of care. With access to the underlying data, an analyst could use a chi-square test to assess whether the difference between people who have group (private) coverage versus Medicaid or other public coverage was statistically significant. State staff could take this analysis further by using multivariable logistic regression to control for the number of primary care providers in the respondents' zip code. This would enable staff to see the extent to which provider supply is associated with this measure of access and whether accounting for provider supply reduces any observed differences in usual source of care based on insurance type.

D. Comparing access over multiple points in time

If you have access to data at multiple points in time for both Medicaid beneficiaries and people with other coverage, there are several ways to compare changes in access between the populations. Methods such as those described below will enable you to identify whether any

Figure 1. Percentage of people with a usual source of care



Source: Minnesota Department of Health. "Health Care Access in Minnesota, Baseline Analysis for Assessing the Impact of the Health Reform in the State." February 2014. Available at <http://www.health.state.mn.us/divs/hpsc/hep/publications/coverage/acaisuebrief0214.pdf>. Accessed May 2, 2018.

* Indicates a statistically significant difference from uninsured at $p < 0.05$.

ADVANTAGES AND CHALLENGES OF USING DIFFERENCE-IN-DIFFERENCES OR COMPARATIVE INTERRUPTED TIME-SERIES ANALYSIS IN AMRPS

Advantages

- Can estimate changes in any difference in access between two groups over time
- Visually intuitive
- Can adjust for differences in other factors that affect access

Challenges

- Requires a high level of statistical expertise
- Requires data with multiple time points for both Medicaid beneficiaries and a comparison group
- Assumes that the makeup of each group stays the same
- Require additional assumptions that should be tested

differences in access between the populations are statistically significant and to visualize whether significant differences change. These methods are typically used to assess the impact of an intervention, but they can also be used to assess changes over time in the AMRP context, regardless of whether a specific policy or intervention has been implemented. In the case of a change in Medicaid policy that might affect access, these methods can be used to assess the impact of that change. But note that using these methods to assess the statistical significance of the results generally requires advanced statistical training.

Difference-in-differences analysis is a statistical approach that could be useful for comparing a change in access between Medicaid beneficiaries and people with other coverage. Although straightforward in concept, implementing the method requires statistical expertise. If your staff do not have this expertise, seek out external experts, such as those from universities or independent research organizations.

Difference-in-differences, as the name implies, compares the change in a measure for one group with the change in the same measure for a second group, over the same period. In statistical terms, difference-in-differences calculates the difference between the baseline and follow-up

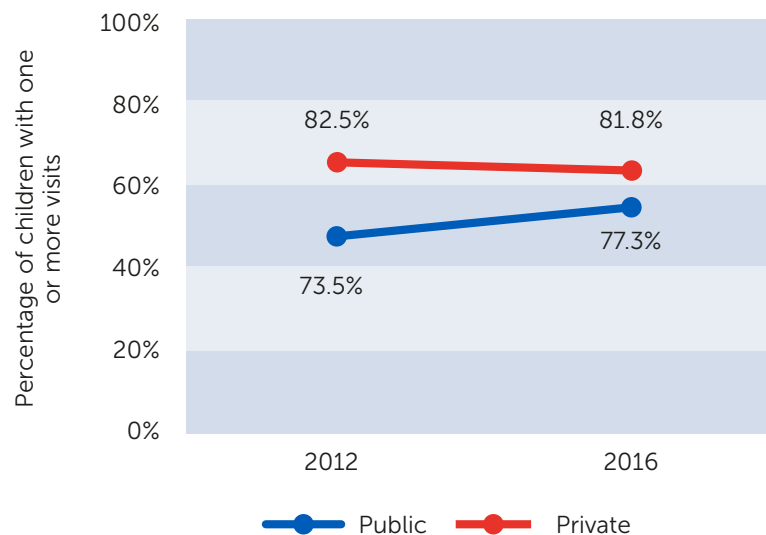
means for the group of interest minus the difference between the baseline and follow-up means for the comparison group.¹¹⁻¹³ In an AMRP, this would be the difference between the 2016 and 2019 measure result for Medicaid beneficiaries minus the difference between the 2016 and 2019 measure result for another population. If there are multiple points of data in the baseline or follow-up period, you can use the means of the data points in a given time period for the difference-in-differences analysis.

As with other statistical analyses, difference-in-differences can be used to compare two groups without adjusting for other characteristics. But the method can also incorporate adjustments for other characteristics (multivariable analysis).

Resources for implementation. Analysts can choose from a range of statistical software packages to conduct these analyses and graph the results,¹⁴⁻¹⁶ or they can consult with external experts.

Example of a difference-in-differences analysis. Figure 2 shows data that could be used for a difference-in-differences analysis, although these results are not specific to Medicaid fee-for-service as would be needed in an AMRP. Basic difference-in-differences results can be obtained by subtracting the change in the measure for

Figure 2. Percentage of children who had at least one preventive dental visit from 2012 to 2016, by type of insurance



Source: Data Resource Center for Child & Adolescent Health. "Interactive Data Query: National Survey of Children's Health." n.d. Available at <http://childhealthdata.org/browse/survey>. Accessed May 3, 2018.

privately insured children (the comparison group) from the change for publicly insured children (the group of interest):

$$(77.3 - 73.5) - (81.8 - 82.5) = 4.5 \text{ percentage points}$$

A result of 0 or almost 0 would suggest that there was no change in the difference in access between the two groups. A positive number suggests that the group of interest had an increase in the measure that is greater than that for the comparison group, and a negative number suggests the opposite. This specific result suggests that access to preventive care visits for publicly insured children grew 4.5 percentage points more than for privately insured children from 2012 to 2016. This reduced the difference in access between the two groups from 9 to 4.5 percentage points. An analyst could use a regression model (with or without controlling for other factors that could affect access) to assess whether these results are statistically significant.

E. Discussion

When the right data are available, states can generate valuable information to add to their AMRPs by directly comparing access to care between Medicaid beneficiaries and people with other forms of coverage.

Several of the methods that states can use to make these comparisons will require help from state staff who have advanced statistical skills or from outside experts, and the results will need to be translated into plain language and graphs for presentation to policymakers. But if executed well, these approaches can inform policymakers about meaningful differences in access between Medicaid beneficiaries and other people—and about changes in those differences over time. Ultimately, this can help states ensure that residents enrolled in Medicaid have the same access to care as the general population.

Endnotes

- ¹ Many statistics textbooks and websites provide guidance on selecting a statistical test. For example, “Choosing the Correct Statistical Test in SAS, Stata, SPSS, and R” offers advice on choosing a test and provides sample coding in four statistical packages; see <https://stats.idre.ucla.edu/other/mult-pkg/whatstat/>.
- ² One example is the Washington Health Workforce Survey (see <https://www.doh.wa.gov/ForPublicHealthandHealthcareProviders/Health-careProfessionalsandFacilities/WashingtonHealth-Workforce>).
- ³ For example, Minnesota used data from the Minnesota Health Access Survey in its AMRP. See <https://www.medicare.gov/medicaid/access-to-care/review-plans/index.html>.
- ⁴ For examples, see the AMRPs from Nevada and Kentucky at <https://www.medicare.gov/medicaid/access-to-care/review-plans/index.html>.
- ⁵ See “Choosing the Correct Statistical Test in SAS, Stata, SPSS, and R” for guidance on choosing a statistical test and sample coding in four statistical packages: <https://stats.idre.ucla.edu/other/mult-pkg/whatstat/>.
- ⁶ SAS Institute, Inc. “The TTEST Procedure.” In *SAS/STAT 13.1 User Guide*. Cary, NC: SAS Institute Inc., 2013. Available at <https://support.sas.com/documentation/onlinedoc/stat/131/ttest.pdf>. Accessed April 30, 2018.
- ⁷ SPSS Tutorials. “SPSS Paired Samples T-Test.” n.d. Available at <https://www.spss-tutorials.com/spss-paired-samples-t-test>. Accessed April 30, 2018.
- ⁸ StataCorp. “ttest — t tests (mean-comparison tests).” n.d. Available at <https://www.stata.com/manuals13/rttest.pdf>. Accessed April 30, 2018.
- ⁹ Spector, P. “Using T-Tests in R.” n.d. Available at <https://statistics.berkeley.edu/computing/r-t-tests>. Accessed April 30, 2018.
- ¹⁰ For the 2016 AMRPs, states were not expected to compare access between Medicaid fee-for-service and other sources of coverage, and we did not identify any AMRPs that did so. Our example is drawn from a data source that was used in Minnesota’s AMRP but was not used to make comparisons.
- ¹¹ Columbia University Mailman School of Public Health. “Difference-in-Difference Estimation.” n.d. Available at <https://www.mailman.columbia.edu/research/population-health-methods/difference-difference-estimation>. Accessed May 3, 2018.
- ¹² Dimick, Justin B., and Andrew M. Ryan. “Methods for Evaluating Changes in Health Care Policy: The Difference-in-Differences Approach.” *Journal of the American Medical Association*, vol. 312, no. 22, 2014, pp. 2401–2402.
- ¹³ Warton, E. Margaret, Melissa M. Parker, and Andrew J. Karter. “How D-I-D you do that? Basic Difference-in-Differences Models in SAS.” 2016. Available at https://www.lexjansen.com/wuss/2016/49_Final_Paper_PDF.pdf. Accessed June 13, 2018.
- ¹⁴ Columbia University Mailman School of Public Health. “Difference-in-Difference Estimation.” n.d. Available at <https://www.mailman.columbia.edu/research/population-health-methods/difference-difference-estimation>. Accessed May 3, 2018.
- ¹⁵ Princeton University Data & Statistical Services. “Getting Started in Data Analysis Using Stata and R.” n.d. Available at <https://dss.princeton.edu/training/>. Accessed June 6, 2018.
- ¹⁶ SAS Institute, Inc. “Usage Note 61830: Estimating the difference in differences of means.” 2018. Available at <http://support.sas.com/kb/61/830.html>. Accessed June 13, 2018.

This brief was prepared by Mathematica Policy Research, under contract to the U.S. Department of Health and Human Services (HHS), Centers for Medicare & Medicaid Services (CMS), Center for Medicaid and CHIP Services (CMCS), Financial Management Group, Division of Reimbursement and State Financing (contract number: HHSM-500-2014-000341). The brief was prepared as part of the CMCS-funded project *Medicaid Program: Methods for Assuring Access to Covered Medicaid Services*.