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Medicaid 1115
Demonstration
Evaluation
Design Plan

Premium Assistance, Monthly Payments, and Beneficiary Engagement

Design Supplement:
Interim Outcomes Evaluation
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TABLES

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This document is a supplement to the Medicaid 1115 Demonstration Evaluation Design Plan prepared by Mathematica Policy Research and submitted to CMS in May 2015.[1] In this supplement, we describe updates to our approach to the interim evaluation of section 1115 demonstrations that expanded Medicaid coverage up to 138 percent of the federal poverty level (FPL) and feature premium assistance, premiums, and/or beneficiary engagement programs that encourage specific health behaviors.[2] The updated approach includes changes resulting from data availability constraints that limit our ability to carry out the evaluation plan as initially envisioned. In particular, Mathematica has not received administrative data from Indiana or encounter records for qualified health plans (QHP) in Arkansas, two of the six states—Arkansas, Indiana, Iowa, Michigan, Montana, and New Hampshire—that implemented alternative Medicaid expansions that incorporate the targeted policies.[3] We will not include analyses that rely on those data sources in the interim outcomes evaluation that we deliver in 2017.

In Tables A.1 through A.3 in the appendix, we present the revised set of research questions and planned analyses that we will include in the interim evaluation report. In Table A.4, we present analyses and research questions deferred to the final outcomes evaluation in 2019, along with a brief justification for each.

A. Background information on the interim evaluation

Our research questions are organized into three domains. Domain 1 explores the advantages and challenges of expanding Medicaid by supporting enrollment in QHPs offered via the Federally Facilitated Marketplace (premium assistance). Domain 2 explores the effect of premiums and other mandatory financial contributions on take-up and continuity of coverage for states that are authorized to require such contributions for beneficiaries with incomes below 138 percent of the FPL.[4] Domain 3 explores the mechanisms and effectiveness of beneficiary engagement programs. Several states are implementing more than one approach within the same demonstration (Table 1).

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[1] Irvin, Carol V., Debra Lipson, Carey Appold, Maggie Colby, Katharine Bradley, Jessica Heeringa, Jenna Libersky, Vivian Byrd, and Julia Baller. "Medicaid 1115 Demonstration Evaluation Design Plan." Final report to the Centers for Medicare & Medicaid Services. Cambridge, MA: Mathematica Policy Research, May 2015. Available at https://www.medicaid.gov/medicaid-chip-program-information/by-topics/waivers/1115/downloads/evaluation-design.pdf.

[2] The threshold of 138 percent of the FPL reflects eligibility expansion up to 133 percent of the FPL, plus a 5 percent income disregard under modified adjusted gross income (MAGI) calculation rules.

[3] On September 30, 2016, Arizona received approval under section 1115 to require monthly payments of Medicaid beneficiaries above the poverty line. Arizona's demonstration has not yet been implemented and is not part of the interim evaluation.

[4] Title XIX of the Social Security Act normally prohibits states from requiring monthly payments from Medicaid beneficiaries with family incomes under 150 percent of the FPL, with certain exceptions—such as working people with disabilities who are eligible under the Ticket to Work and Work Incentives Improvement Act. Section 1115 authority is therefore relevant when monthly payments are collected from adults who are not disabled with incomes under 150 percent of the FPL, but alternative Medicaid expansion demonstrations include only adults with incomes up to 138 percent of the FPL.

Table 1. Demonstrations with premium assistance, monthly payments, and/or beneficiary engagement programs

State	Coverage start date	Domain 1: Mandatory Medicaid-supported QHP enrollment (premium assistance)	Domain 2: Premiums or other monthly contributions (monthly payments)	Domain 3: Beneficiary engagement programs to encourage health behaviors
Arkansas	Jan. 2014	X	X (started Jan. 2015, paused Apr. 2016, resumed Jan. 2017[a])	X[a]
Indiana	Feb. 2015		X	X
Iowa	Jan. 2014	Ended Dec. 2015	X	X
Michigan	Apr. 2014	X (some groups, beginning Apr. 2018)[a]	X	X
Montana	Jan. 2016		X	
New Hampshire	Jan. 2016	X		

[a] Policies implemented after September 2016 will be included in the final outcomes evaluation in 2019.

In the interim outcomes evaluation, we expect to address most of the research questions presented in our initial evaluation design report for the three domains. In Appendix Tables A.1 through A.3 (at the end of this document), we present a refined analytical approach for each research question that reflects our updated understanding of data availability, implementation timing, and appropriate outcome measures and comparison states. In all three domains, we will use a mix of rigorous regression-based approaches, descriptive quantitative analyses, and qualitative syntheses of state evaluation findings and key informant interviews conducted for the rapid-cycle reports we produced in 2015 and 2016.

Findings from the interim evaluation will focus on demonstration operations from 2014 through mid-2016. Given that demonstrations in Montana and New Hampshire began in 2016 and will not have been operating for a full year, we will consider evaluation questions that examine only enrollment data for these states, as it is too soon to evaluate utilization patterns. In the final evaluation, we will update all analyses conducted for the interim evaluation with additional years of data and will include Montana and New Hampshire in utilization analyses that we conduct at that time. We will also include Indiana and Arkansas in the full set of analyses, assuming that we are able to obtain administrative data that are currently outstanding for those states.

In the remainder of this design supplement, we first discuss the domain-specific research questions (section B). We then review data sources (section C), the demonstration and comparison states (section D), and likely challenges to implementing plans for the interim evaluation (section E).

B. Research questions addressed in the interim evaluation

Domain 1: Medicaid-supported enrollment in QHPs. Research questions in Domain 1 (Table A.1) explore the advantages and challenges of expanding Medicaid by supporting enrollment in QHPs offered via the Federally Facilitated Marketplace, as opposed to expanding

Medicaid coverage directly. Use of Medicaid funds to support enrollment in non-Medicaid health plans is known as premium assistance. Arkansas, Iowa, and New Hampshire implemented premium assistance programs at some point from 2014 through 2016[5] and will be included in the interim evaluation. Because we do not have access to QHP encounter data, we will include Arkansas only in analyses that rely on fee-for-service claims (wrap-around service use) and data from surveys, state evaluation reports, and public records on health plan participation in the Marketplaces.

Domain 1 questions ask how premium assistance compares to a direct Medicaid expansion in terms of (1) access to medical care and health outcomes, (2) total Medicaid spending, and (3) take-up rates for likely eligible adult populations. Each overarching topic includes several subordinate research questions. For example, to investigate how access and health outcomes compare between states that pursued Medicaid expansion via QHPs and those that expanded Medicaid directly, we will explore how promptly beneficiaries began to receive health care services and the provision of wrap-around services for QHP beneficiaries[6] (Research Question 1a); whether there are similar patterns of active provider participation (Research Question 1b); whether survey data reveal differential unmet needs for medical care (Research Question1c); and whether there are patterns in health plan issuer participation that might have implications for continuity of coverage across Medicaid and Marketplace plans (Research Question 1d).

For the interim outcomes evaluation, we will partially or fully address seven of the eight Domain 1 research questions proposed in the original evaluation design plan. Our analytic approaches remain closely aligned with the original plan. As noted, given that New Hampshire's demonstration began in 2016, we will include New Hampshire only when examining enrollment outcomes, as it is too soon to evaluate utilization patterns. In the final evaluation, we will use additional years of data to update all analyses conducted for the interim evaluation and will include both Arkansas and New Hampshire when examining research questions related to utilization, if adequate data are available.

For three Domain 1 research questions that we will partially address in the interim evaluation, we also plan to incorporate additional data sources and outcome measures for the final evaluation report, as noted in Table A.4.

We will entirely defer one research question to the final evaluation: How do premium assistance states compare in terms of states' administrative costs? We had proposed to use CMS-

[5] Michigan will begin the premium assistance component of its demonstration in April 2018. As such, we will include Michigan as a comparison state for Domain 1 for the interim evaluation.

[6] The three Domain 1 demonstration states differ in the wrap-around benefits they offer. Arkansas includes Early and Periodic Screening, Diagnostic, and Treatment (EPSDT) services for those under age 21, family planning services, and non-emergency medical transportation (with prior authorization only). Iowa includes EPSDT services for those under age 21, family planning services, and adult dental care (dental benefits include emergency, basic, and preventive dental care, with the opportunity to earn enhanced benefits such as restoration). New Hampshire includes EPSDT services for those under age 21, family planning services, non-emergency medical transportation, adult dental care (limited to treatment of acute pain or infection), and adult vision care.

64 expenditure data to examine these costs, but our initial review of data for federal fiscal years 2013 and 2014 suggests that the administrative cost data are volatile and insufficiently granular, as states made changes in response to the Affordable Care Act that are largely unrelated to demonstration status. We will still include this research question in the final outcomes evaluation, but will gather data to address the question through state evaluation reports, state quarterly monitoring reports, and key informant interviews.

Domain 2: Premiums or other monthly contributions. Research questions in Domain 2 (Table A.2) explore the effect of premiums and other monthly financial contributions on take-up and continuity of coverage for states authorized to require such payments of beneficiaries with incomes below 138 percent of the FPL. We refer to such payments as monthly payments, reflecting the fact that some states consider them to be account contributions rather than premiums. Five states—Arkansas, Indiana, Iowa, Michigan, and Montana—implemented demonstrations that collected monthly payments from beneficiaries at some point during the 2014 through 2016 period. We will include all five states in the interim evaluation but will include Indiana only in analyses that rely on national household survey data; we will not include Indiana in analyses that rely on administrative data.

The research questions for Domain 2 focus on understanding the extent to which monthly payments are associated with enrollment decisions. The principal concern with monthly payments is that they might discourage people with limited incomes from enrolling in Medicaid or from staying enrolled. Conversely, it is possible that the requirement to make monthly payments acts as a signal that Medicaid coverage is valuable, which could encourage take-up or continued enrollment for some individuals. Monthly payments should affect the perceived price or accessibility of specific health care services for enrolled beneficiaries only if a state's demonstration protocol explicitly links monthly payments to completion of particular incentivized behaviors or to eligibility for enhanced benefits.

For the interim outcomes evaluation, we will address two of the four Domain 2 research questions proposed in the original evaluation design plan, and we have added several new questions that are refinements of the research questions and analytic strategies originally planned (Table A.2). For example, we previously posed a research question exploring the effects on take-up of different monthly payment amounts. For the interim evaluation, we have explicitly added a question about whether adults who are likely eligible for Medicaid enroll at the same rate in states with monthly payments as compared to states that implemented traditional Medicaid expansions without monthly payments (Research Question 1a). We have also added a question about whether take-up differs across key demographic groups (Research Question 1b). These new questions can enhance our understanding of the extent to which monthly payments for some beneficiaries affects the likelihood of enrollment for all eligible adults.

We will defer one planned analytic approach to investigate renewals, and we will fully defer two planned research questions to the final evaluation (Table A.4). Both of the deferred questions focus on policies that exist only in Indiana. One of these questions is, How does a requirement to make payments to complete enrollment, as compared to paying after an initial period of enrollment, affect take-up? The second deferred question is, What is the effect of payment enforceability rules such as "lock-out" periods before re-enrollment? If we are able to use administrative data from Indiana for the final outcomes evaluation, we will address both

questions at that point. We plan to use Montana as the comparison state for both analyses, although it is possible that other states may obtain CMS's permission to implement similar policies in the interim. Among current demonstration states, Montana is the most appropriate comparison state because it also requires monthly payments in the first month of enrollment and disenrolls beneficiaries with incomes above 100 percent of the FPL for nonpayment. Montana differs from Indiana in that it allows a 90-day grace period before disenrollment and does not have a lock-out period; instead, beneficiaries may re-enroll upon payment or assessment of debt.

It is important to compare re-enrollment trends among states that disenroll beneficiaries for nonpayment (with and without lock-out periods). Beneficiaries who disenroll and have a gap in Medicaid coverage as a result of eligibility changes may be less likely to re-enroll. Comparing re-enrollment after lock-out in Indiana to re-enrollment in states that do not disenroll for nonpayment could understate the effect of a lock-out policy. In conducting these analyses, we plan to limit the comparison to the first year of enrollment because those disenrolled for nonpayment after successfully completing renewal are likely to differ in unobservable ways from those disenrolled during their first year.[7] For example, those who have renewed once are likely to value Medicaid more highly that those who have not renewed. We would expect to see higher re-enrollment rates within this group, which could lead to overstatement of the effect of a lock-out policy. For the final outcomes evaluation, we will examine the effects of lock-out periods by looking at re-enrollments and the typical gap before re-enrollment among individuals disenrolled in their first year of coverage in Indiana and Montana.

Domain 3: Beneficiary engagement programs to encourage health behaviors. Research questions in Domain 3 (Table A.3) explore the mechanisms and effectiveness of beneficiary engagement programs designed to encourage specific health behaviors. We will include in the interim evaluation all three states that implemented a demonstration involving health behaviors—Indiana, Iowa, and Michigan—but we will include Indiana only in analyses relying on survey data, state evaluation reports, or key informant interviews because we do not have administrative data for the state.

Approved demonstrations with beneficiary engagement features allow the use of financial incentives to encourage appropriate use of health care services among Medicaid enrollees. We will explore the variation in and effectiveness of states' beneficiary education strategies, which are especially important in demonstrations with complex incentive structures. We will also evaluate which incentives are most likely to affect beneficiary behavior in desired ways. Under both of these overarching topics, we will explore several subordinate research questions. For example, in investigating which incentives influence behavior as desired, we will explore which incentives are associated with the greatest relative gains in preventive care and management of chronic conditions (Research Question 3a).

[7] Beneficiaries in Iowa's demonstration may be disenrolled for nonpayment, but only after successfully renewing coverage for a second enrollment year because premiums do not begin until enrollment month 13, and only if individuals have not completed required health behaviors. In addition, beneficiaries in Iowa may re-enroll without paying premiums owed.

Beneficiary engagement programs vary across states in several respects. One important source of variation is whether beneficiaries are able to earn financial rewards during the current enrollment year. For example, in Michigan, beneficiaries are required to make monthly payments beginning in their seventh month of enrollment. Those payments may be reduced upon the completion of specified services, making the reward timely relative to beneficiary behavior. In contrast, Iowa beneficiaries who complete specific health behaviors in their first year of enrollment can avoid paying premiums in their second year of enrollment. Thus, financial rewards are most valuable to beneficiaries who maintain enrollment at renewal. Another important source of variation relates to the health plans with which the states partner to administer their programs. As we learned through key informant interviews for the rapid-cycle reports, many health plans offer additional financial incentives that encourage beneficiaries to actively engage with their health by, for example, receiving preventive services, attempting to quit smoking, or engaging with a care manager. As we try to identify the specific effects of demonstration-related incentives on beneficiary outcomes, we will attempt to take advantage of variation across states, accounting, where possible, for sources of variation unrelated to the demonstration design (such as health plan enrollment).

For the interim outcomes evaluation, we will partially or fully address five of the eight Domain 3 research questions proposed in the evaluation design plan. The approaches outlined in Table A.3 reflect refinements of the originally planned research questions, analytic strategies, and outcome measures. For example, the original evaluation plan posed the question, To what extent can program incentives encourage Medicaid enrollees to actively participate in their care? We have refined this (Research Question 2) to ask, To what extent are Medicaid enrollees responsive to explicit program incentives? To address this question, we have added an analytical approach to examine whether beneficiaries are more likely to receive services if they have a financial incentive to do so. We have also refined Research Question 3, which originally asked if incentives for wellness behaviors work, to read, How do the incentives affect overall access to and use of care? We address this by examining receipt of recommended preventive services and management of chronic conditions, which are not explicitly incentivized in Iowa and Michigan but may be indirectly affected by program incentives. In the final evaluation, we will update all analyses conducted for the interim evaluation with additional years of data and will incorporate Indiana if administrative data become available.

We will defer three questions to the final evaluation (Table A.4). For the interim evaluation, we will synthesize state documentation and findings from key informant interviews about state strategies to educate beneficiaries about preferred health behaviors, but we will lack sufficient information on beneficiary understanding across states to explore rigorously which educational strategies are more effective. We could improve the analyses by first understanding the degree of variation in beneficiary outcomes that seems to be associated with demonstration design, a key objective of the interim evaluation. The second question that we will defer until the final evaluation is, How do program incentives affect volume of and access to care? Indiana's demonstration offers beneficiaries the strongest incentives for managing overall expenditures; however, without administrative data from Indiana, there is less to be learned from the analyses. The third question that we will defer until the final evaluation is, What administrative costs do states with healthy behavior incentive programs incur to establish and maintain these programs? The relevant information is not contained in state documentation and is not reflected in

administrative data. In future years, we may be able to collect the needed data through key informant interviews as part of a rapid-cycle report.

C. Data sources for the interim evaluation

Medicaid administrative data. We obtained Medicaid administrative data directly from most demonstration states for January 2012 through September 2016, including Arkansas (33 months of post-demonstration data), Iowa (33 months), Montana (9 months), and New Hampshire (9 months). We will used data from the Medicaid Analytic eXtract (MAX), including the early version of MAX data known as Alpha-MAX, for Michigan,[8] for Montana for 2012–2014, and for comparison states when available—including Ohio, Oregon, Pennsylvania, Washington, and West Virginia. MAX and Alpha-MAX are both research versions of state Medicaid Statistical Information System (MSIS) submissions.[9] Table 2 presents sources of administrative data by state and year.

We were unable to obtain demonstration administrative data from Indiana. As a result, Indiana is included only in analyses of survey data.

Table 2. Source of Medicaid administrative data

State	2012	2013	2014	2015	2016 (through September)
Demonstration states					
Arkansas	State file	State files	State files	State files	State files
Iowa	State file	State files	State files	State files	State files
Michigan	MAX	MAX	Alpha-MAX (Q7)	Alpha-MAX (Q3)	None available
Montana	MAX	Alpha-MAX (Q5)	Alpha MAX (Q1)	State files	State files
New Hampshire	State file	State files	State files	State files	State files
Comparison states					
Ohio	MAX	MAX	Alpha-MAX (Q3)	None available	None available
Oregon	MAX	Alpha-MAX (Q7)	Alpha-MAX (Q6)	Alpha-MAX (Q2)	None available
Pennsylvania	MAX	MAX	MAX	Alpha-MAX (Q3)	None available
Washington	MAX	MAX	Alpha-MAX (Q4)	None available	None available
West Virginia	MAX	MAX	MAX	Alpha-MAX (Q3)	None available

Note: MAX data are produced with seven quarters of data. The number of quarters available for Alpha-MAX is in parentheses. Only partial-year estimates are available for states with fewer than four quarters of Alpha-MAX data. More than four quarters indicates the addition of adjustment records.

[8] Michigan collects monthly payments only for beneficiaries with incomes above the FPL. Given that MSIS does not include income information for beneficiaries, it will not be possible to distinguish beneficiaries above and below the FPL in Michigan, thus limiting Michigan's inclusion in some analyses. In addition, MSIS data do not contain information on whether a beneficiary was credited with completing a health risk assessment, one of the incentivized behaviors that earns beneficiaries reduced premiums in Michigan. For the final evaluation, we will consider making a direct request of Michigan for data to understand individual-level health risk assessment completion.

[9] CMS develops MAX data as a more research-friendly version of MSIS files. MAX production requires seven quarters of MSIS data, including four quarters for the calendar year plus three additional quarters with adjustment records.

Integrated Public Use Microdata Sample (IPUMS). To estimate the expansion population eligible for Medicaid in each state and to model changes in the probability from 2012 through 2015 that the likely eligible population reports having Medicaid coverage, we will use IPUMS data prepared by the Minnesota Population Center at the University of Minnesota (Ruggles, Genadek, Goeken et al. 2015). IPUMS uses U.S. Census Bureau data, including data gathered through the American Community Survey (ACS). The ACS provides annual data on health insurance coverage status and demographic characteristics, including income, citizenship, gender, disability status, race, and ethnicity. ACS data are collected throughout the year using 12 independent monthly samples. State-level estimates of health coverage derived from IPUMS may be thought of as an average for the year in each state.[10] As with other national household surveys, health insurance coverage is self-reported in IPUMS; a known undercount of Medicaid enrollment is estimated to be in line with that of other national surveys.[11] IPUMS is available through 2015.

We will define the expansion population in each state to include nondisabled, nondual adults ages 19 through 64 who are citizens or naturalized citizens,[12] have incomes at or below 138 percent of the FPL, and do not receive Supplemental Security Income, which may indicate a disability that would otherwise qualify them for Medicaid. We plan to include individuals who report employer-sponsored coverage in the likely eligible population because the proportion of low-income workers offered employer-sponsored health insurance coverage has declined (Long et al. 2016), possibly as employers have responded to the availability of Medicaid for their employees in states that expanded coverage or for other reasons, such as general management of overhead costs as insurance premiums have continued to rise. These dynamics mean that some low-income adults will lose employer-sponsored insurance during the study period and should be included in the count of adults likely eligible for Medicaid.

Behavioral risk factor surveillance system (BRFSS). We will use BRFSS data to examine population-level changes in unmet need for care as well as for preventive and chronic care behaviors among nonelderly low-income adults, regardless of insurance status. We will use data for 2012 to 2016 that include those ages 18 through 64 years with annual household incomes

[10] The ACS has a large sample, and its approach to creating annual average estimates of health insurance coverage is considered to be more accurate than the approach used for the Current Population Survey, which produces annual point-in-time estimates for each state. The U.S. Census Bureau constructs survey weights for the ACS to account for seasonal fluctuations in population and other sources of potential bias (Spielman, Folch, and Nagle 2014); our analyses will incorporate the survey weights.

[11] Research before the 2014 Medicaid coverage expansions documented that the ACS undercounts individuals with Medicaid coverage; linked 2008 ACS and MSIS data indicate that about 83 percent of Medicaid enrollees with incomes below 138 percent of the FPL accurately reported enrollment in Medicaid (Boudreaux, Call, Turner at al. 2013). It is not possible to remedy this problem by using a different federal survey because the Current Population Survey, National Health Interview Survey, and Medical Expenditure Panel Survey all undercount the Medicaid population to comparable or greater degrees.

[12] Although some groups of "lawfully present" immigrants are eligible for Medicaid, the variables available in IPUMS do not distinguish between groups that are and are not eligible. We exclude all noncitizens because their inclusion would introduce substantial error. It would also introduce differential error across states because some states have more noncitizens than others.

under $35,000. Given that we cannot observe insurance status, the income limit is intended to make our sample more similar to the Medicaid population, although the low-income individuals in the BRFSS data will include current and former Medicaid enrollees and some individuals who have never been enrolled in Medicaid. We will be able to detect population-level effects under several situations: if Medicaid demonstrations successfully motivate changes in care-seeking behavior that persist after Medicaid enrollment; if the effects of specific financial incentives diffuse to other health behaviors that states promote but do not explicitly incentivize; or if the learned behavior diffuses to peers and relatives of beneficiaries who are not directly enrolled. BRFSS data sets are available through 2015.

State evaluation and monitoring reports. We will review state evaluation and monitoring reports submitted to CMS through April 2017 to help answer research questions that address (1) states' efforts to educate beneficiaries about the demonstrations and (2) findings from state-led surveys that may shed light on beneficiaries' understanding of the demonstrations' incentives. Most demonstration states have submitted monitoring reports covering the first half of 2016, the same time frame for which we are gathering administrative data. A review of these evaluation and monitoring reports will provide context for interpreting findings from planned quantitative analyses.

D. States included in the interim evaluation

Demonstration states. We will include Arkansas, Indiana, Iowa, Michigan, Montana, and New Hampshire in the interim outcomes evaluation. As noted, given that demonstrations in Montana and New Hampshire began in 2016 and will not have been operating for a full year, we will consider evaluation questions that examine only enrollment data for these states, as it is too soon to evaluate utilization patterns. Due to the lack of administrative data for Indiana, we will include Indiana only in analyses that draw on other data sources. Likewise, the lack of QHP encounter data in Arkansas will limit Arkansas's inclusion as a demonstration state in some Domain 1 research questions and as a comparison state for Domain 3 research questions.

We will also use demonstration states as comparison states if their alternative Medicaid expansions do not include the policy under examination in a particular domain. For example, New Hampshire is a comparison state for analyses of the relationship between monthly payments and enrollment because beneficiaries in its demonstration do not owe monthly payments (Domain 2).[13] We will also conduct cross-state comparisons of states that did and did not require beneficiaries to make monthly payments during the first year of enrollment (Domain 2) and of demonstration states that did and did not include specific beneficiary engagement features (Domain 3). Tables A.1 through A.3 note when demonstration states are used as comparison states for a particular analysis.

[13] New Hampshire initially implemented a traditional Medicaid expansion in August 2014. Under the current demonstration, the state operates a premium assistance program to support enrollment in QHPs and is therefore included as a demonstration state for Domain 1 analyses.

Comparison states. For most analyses, we will compare outcomes in the demonstration states with five nondemonstration comparison states: Ohio, Oregon, Pennsylvania, Washington, and West Virginia. These states are similar to the demonstration states in two important respects: each expanded Medicaid to include nonelderly adults with incomes up to 138 percent of the FPL in 2014 or 2015, and each had historically low income eligibility thresholds for adults before the expansions. For analyses that rely only on national survey data, we will include another four states that meet the same criteria: Kentucky, Nevada, New Mexico, and North Dakota.[14] For the interim evaluation, we cannot use these four states for analyses that rely on Medicaid administrative data because of a data gap during 2014 and 2015 associated with the transition from the Medicaid Statistical Information System (MSIS) to Transformed MSIS (T-MSIS). We plan to include these comparison states in a broader set of analyses in the final evaluation, assuming that adequate administrative data are available at that time.

The set of comparison states that we can use in the interim evaluation will be more limited when considering utilization outcomes. Encounter data are unavailable for West Virginia. We will also test whether results are sensitive to including Ohio and Pennsylvania when examining Domain 1 utilization outcomes, as we will have only nine months of post-expansion data in these states.[15] Table 3 summarizes the set of comparison states by data source.

[14] Several of these comparison states implemented limited expansions of adult coverage through section 1115 authority before 2014. These early programs limited the number of enrollees (New Mexico, Oregon, Washington), the benefit plan (New Mexico), and/or the targeted geographic area (Ohio). These states are appropriate comparators because they implemented full Medicaid expansions under the Affordable Care Act in 2014 and experienced large increases in the number of enrolled nondisabled adults at the same time as the states that implemented alternative Medicaid expansions. For example, there was a 65 percent increase in Medicaid enrollment among adults in Oregon from 2013 to 2014, net of transfers from state-funded programs. Similarly, there was a 46 percent increase in Medicaid enrollment among adults from 2013 to 2014, net of transfers from state-funded programs. These percentage changes in enrollment were among the top one-third of states that expanded Medicaid in 2014. (Figures are based on Mathematica analysis of Medicaid and CHIP Performance Indicator data and on state reports of enrollment in state-funded programs that predated the 2014 Medicaid expansions.) Two demonstration states, Michigan and Indiana, also operated limited programs for adults through section 1115 authority before their current demonstrations.

[15] Although Ohio expanded Medicaid in January 2014, only nine months of post-expansion data are available because MAX and Alpha-MAX are available for Ohio through September 2014.

Table 3. Comparison states by major analysis type

State	Medicaid expansion date	Included in enrollment analyses based on administrative data	Included in utilization analyses based on administrative data	Included in analyses based on national survey data
Kentucky	January 2014			X
Nevada	January 2014			X
New Mexico	January 2014			X
North Dakota	January 2014			X
Ohio	January 2014	X	?[a]	X
Oregon	January 2014	X	X	X
Pennsylvania	January 2015	X	?[a]	X
Washington	January 2014	X	X	X
West Virginia	January 2014	X		X

[a] Inclusion in the Domain 1 analyses that require only 6 months of enrollment will depend on the results of sensitivity analyses, as we will have only 9 months of post-expansion data for this state. These states will be excluded from Domain 1 analyses that require 12 months of enrollment, and from all Domain 3 analyses, which require 12 months of enrollment.

E. Key challenges

The evaluation involves three significant analytic challenges. The first challenge lies in sub-state variation in program implementation, which could affect the outcomes of interest. For example, we know through key informant interviews that health plans have layered their own incentives and rewards on top of those that are officially part of the demonstration design. These health plan programs, which tend to offer short-term rewards, may drive or amplify some observed outcomes. The data are not available to allow the evaluation to control for which beneficiaries were offered which additional incentives.

A second challenge is the intertwining aspects of program features in different domains, which will make it challenging to disentangle the effects of each feature with certainty. For example, several states incentivize health behaviors by waiving (Iowa) or reducing (Michigan) monthly payments for beneficiaries who engage in such behaviors. In other words, the pool of beneficiaries liable for maximum monthly payments will be limited to those who have not completed recommended health behaviors, introducing some selection bias in examining enrollment continuity within the group. Those who are unwilling to complete a health risk assessment and physician visit may value health care less and therefore may be more likely to disenroll regardless of the payment requirement.

A third challenge is that the data obtained directly from demonstration states are not adequate for all of the analyses we initially proposed. For example, the eligibility data we received from Arkansas do not contain usable data on income, limiting our ability to conduct analyses that must determine the monthly payments that individual beneficiaries would have been required to make. In some cases, such data limitations prevent us from carrying out a planned analytical approach in the interim evaluation (Table A.4 lists analyses postponed to the

final outcomes evaluation). In other cases, data limitations cause us to restrict the states included in a particular analysis. Where relevant, we note these limitations in Tables A.1 through A.4.

F. References

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APPENDIX A

RESEARCH QUESTIONS AND ANALYTICAL APPROACHES BY DOMAIN

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Table A.1. Domain 1 research questions and approaches for the interim evaluation: Medicaid-supported enrollment in Qualified Health Plans

Analytical approach	Outcome measures	Data sources	Demonstration states	Comparison states	Crosswalk to original evaluation design plan for Domain 1
1. How do states supporting QHP enrollment for newly eligible beneficiaries compare to other Medicaid expansion states in terms of access and health outcomes?					
1a. Are beneficiaries enrolled in QHPs able to access care at similar or better rates compared to beneficiaries enrolled in direct Medicaid expansions?					
Descriptive regression framework: Examine relative use of services, controlling for observable beneficiary characteristics Descriptive analysis of whether there is differential receipt of care by demographic characteristics	Percentage receiving: Any physician visit within two and six months of enrollment A prescription within two and six months of enrollment Wrap-around services that are standard benefits in Medicaid expansion states Average PMPM use of: Physician services Prescriptions Wrap-around services	MAX and Alpha-MAX Administrative data from demonstration states	Iowa, Arkansas (wrap-around services only)	Michigan[a], Ohio, Oregon, Pennsylvania, Washington	Research Question 1a
1b. Does provider participation improve under premium assistance?					
Descriptive analysis of claims submissions across providers Synthesis of state-reported data on provider participation	Percentage of providers submitting claims for more than two Medicaid patients State-reported metrics on provider network adequacy	MAX and Alpha-MAX Administrative data from demonstration states State evaluation reports	Iowa, Arkansas, New Hampshire (state-reported metrics only)	Michigan, Ohio, Oregon, Pennsylvania, Washington	Research Question 1b

TABLE A.1 (CONTINUED)

Analytical approach	Outcome measures	Data sources	Demonstration states	Comparison states	Crosswalk to original evaluation design plan for Domain 1
1c. What is the unmet need for medical care?					
Descriptive statistics and difference-in-differences model Synthesis of state-reported beneficiary survey data	Percentage self-reporting: A personal doctor or health care provider Unmet medical need due to cost Time since last routine doctor visit State-reported metrics from beneficiary surveys	BRFSS State evaluation reports	Arkansas, Iowa	Kentucky, Indiana, Michigan, Nevada, New Hampshire,[b] New Mexico, North Dakota, Ohio, Oregon, Pennsylvania, Washington, West Virginia	Research Question 1c
1d. Is there continuity of coverage when switching between Medicaid and Marketplace coverage?					
Qualitative analysis of patterns in issuer participation	Patterns of issuer participation in Marketplace and Medicaid premium assistance programs	Marketplace and Medicaid data on plan participation	Arkansas, Iowa, New Hampshire	Indiana, Kentucky, Michigan, Nevada, New Mexico, North Dakota, Ohio, Oregon, Pennsylvania, Washington, West Virginia	Research Question 1d
2. How do states supporting QHP enrollment compare to other Medicaid expansion states in terms of total spending, especially given QHP premium variability over time?					
2a. How do premium assistance states compare to other Medicaid expansion states in terms of per beneficiary spending on direct medical services and capitation payments?					
Descriptive statistics and difference-in-differences model	Total PMPM spending on direct medical expenditures and premium payments to QHPs	MAX and Alpha-MAX Administrative data from demonstration states	Arkansas,[c] Iowa	Michigan, Ohio, Oregon, Pennsylvania, Washington	Research Question 2a

TABLE A.1 (CONTINUED)

Analytical approach	Outcome measures	Data sources	Demonstration states	Comparison states	Crosswalk to original evaluation design plan for Domain 1
3. How do states supporting QHP enrollment compare to other Medicaid expansion states in terms of take-up rates?					
3a. Does the take-up rate among likely eligible individuals in premium assistance states compare to states with traditional Medicaid expansions?					
Descriptive analysis of whether there is differential participation by key demographic groups	Proportion of likely eligible population enrolled in Medicaid at the time of the survey (annual) by demographic characteristics	MAX and Alpha-MAX Administrative data from demonstration states IPUMS	Arkansas, Iowa	Michigan, New Hampshire,[b] Ohio, Oregon, Pennsylvania, Washington, West Virginia	Research Question 3a
3b. Are there patterns in the timing of Medicaid beneficiary enrollment in premium assistance states that may be related to the Marketplace open enrollment period, even though Medicaid beneficiaries are not subject to open enrollment periods?					
Descriptive statistics Regression model, with indicators for open enrollment months	Counts of monthly enrollment	MAX and Alpha-MAX Administrative data from demonstration states	Arkansas, Iowa, New Hampshire	Michigan, Ohio, Oregon, Pennsylvania, Washington, West Virginia	Research Question 3b

BRFSS = Behavioral Risk Factor Surveillance System; MAX = Medicaid Analytic eXtract; Alpha-MAX = Alpha Medicaid Analytic eXtract; QHP = qualified health plan; PMPM = per member per month; IPUMS = Integrated Public Use Microdata Sample

[a] Michigan does not begin the premium assistance component of its demonstration until April 2018, so we will include it in the set of comparison states for the interim evaluation analysis.

[b] New Hampshire will be included in the interim evaluation as a comparison state for this research question since BRFSS and IPUMS data are currently available through 2015. New Hampshire implemented a regular Medicaid expansion in August 2014 before the QHP demonstration began in January 2016. In the final evaluation, we will include New Hampshire as a demonstration state for data from 2016 and later.

[c] Arkansas will be included in this analysis if capitation payments to QHPs are accurately reflected in the records we have received from the state.

Table A.2. Domain 2 research questions and approaches for the interim evaluation: Premiums and other monthly contributions (monthly payments)

Analytical approach	Outcome measure	Data sources	Demonstration states	Comparison states	Crosswalk to original evaluation design plan for Domain 2
1. To what extent do requirements for monthly payments affect enrollment patterns?					
1a. Do eligible adults in states with required monthly payments enroll in Medicaid (or premium assistance programs) at the same rate as eligible adults in other states?					
Regression model of Medicaid enrollment among the likely eligible population	Reported enrollment in Medicaid at the time of survey (annual)	IPUMS	Arkansas, Indiana, Iowa, Michigan	Kentucky, Nevada, New Mexico, North Dakota, Ohio, Oregon, Pennsylvania, Washington, West Virginia, Montana, New Hampshire	Refinement of Research Question 1
Descriptive analysis of take-up among likely eligible population	Proportion of likely eligible population enrolled in demonstration (annual)	State enrollment data and MAX/Alpha-MAX; IPUMS	Arkansas, Iowa, Michigan, Montana	Ohio, Oregon, Pennsylvania, Washington, West Virginia, New Hampshire	Refinement of Research Question 1
1b. Do eligible adults in key demographic groups who live in states with required monthly payments enroll in Medicaid (or premium assistance programs) at the same rate that eligible adults in other states do?					
Regression model of Medicaid enrollment among key demographic groups	Reported enrollment in Medicaid at the time of survey (annual), by demographic characteristics	IPUMS	Arkansas, Indiana, Iowa, Michigan	Kentucky, Nevada, New Mexico, North Dakota, Ohio, Oregon, Pennsylvania, Washington, West Virginia, Montana, New Hampshire	Refinement of Research Question 1
Descriptive analysis of differential take-up among key demographic groups	Proportion of likely eligible population enrolled in demonstration (annual), by demographic characteristics	State enrollment data and MAX/Alpha-MAX; IPUMS	Arkansas, Iowa, Michigan, Montana	Ohio, Oregon, Pennsylvania, Washington, West Virginia, New Hampshire	Refinement of Research Question 1
1d. How do monthly payment amounts affect take-up of coverage?					
Regression model of enrollment among the likely eligible population, given likely monthly payment amount required	Reported enrollment in Medicaid at the time of survey (annual)	IPUMS	Arkansas, Indiana, Iowa, Michigan	Kentucky, Nevada, New Mexico, North Dakota, Ohio, Oregon, Pennsylvania, Washington, West Virginia, Montana, New Hampshire	Research Question 1b

TABLE A.2 (CONTINUED)

Analytical approach	Outcome measure	Data sources	Demonstration states	Comparison states	Crosswalk to original evaluation design plan for Domain 2
Descriptive analysis of take-up among likely eligible population by likely monthly payment amount required	Proportion of likely eligible population enrolled in demonstration (annual)	State enrollment data and MAX/Alpha-MAX; IPUMS	Iowa, Montana[a]	New Hampshire[a]	Research Question 1b
2. What effects do monthly payments appear to have on continuity of coverage?					
2a. Is there a relationship between mid-year disenrollments and the timing of monthly payment policies?					
Descriptive regression analysis of payment onset and likelihood of enrollment continuity	Continued enrollment at specified policy-relevant months	State enrollment data and MAX/Alpha-MAX	Arkansas, Michigan, Montana	Iowa,[b] New Hampshire, Ohio, Oregon, Pennsylvania, Washington, West Virginia,	Refinement of Research Question 2a
Descriptive analysis of proportion disenrolled mid-year	Proportion disenrolled mid-year and proportion disenrolled mid-year for nonpayment	State enrollment data and MAX/Alpha-MAX	Arkansas, Michigan[c]	Iowa,[b] New Hampshire, Oregon, Washington, West Virginia	Refinement of |Research Question 2a
2b. Is there a relationship between monthly payment requirements and renewals?					
Descriptive regression analysis of enrollment continuity at renewal	Renewed enrollment rates by whether payments are required for any beneficiaries	State enrollment data and MAX/Alpha-MAX	Arkansas, Iowa, Michigan[c,d]	New Hampshire, Oregon, West Virginia	Refinement of Research Question 2a

[a] Because MAX and Alpha-MAX do not contain data on beneficiary incomes, we can include in this analysis only those states from which we directly obtained data. Historical income data are not available for Arkansas, so we are unable to determine likely premium amounts with enough precision to include Arkansas in this analysis. Iowa did not impose premiums until 2015, so it would be considered a "comparison" state when looking at 2014 data. This means that we do not have administrative data for any demonstration states that imposed premiums in 2014 that would allow us to assess who was and was not subject to premiums in that year.

[b] This analysis examines enrollment continuity for each beneficiary's first enrollment spell, before renewal. Iowa does not impose premiums until a beneficiary has successfully renewed coverage and will therefore serve as a comparison state for this analysis.

[c] Montana is omitted from this analysis because of the 2016 demonstration start date. We will not have an opportunity to observe the first full year of potential enrollment or annual renewals for this interim evaluation.

[d] This research question previously included an analysis of renewal by the change in payment amount (no change, increase, or decrease over the previous year). Income data for Michigan are not available through MAX and Alpha-MAX, and historical income data are not available for Arkansas, so we have simplified the analysis for the interim evaluation. We will consider renewal rate by changes in payment amount for the final evaluation if accurate income data are available.

MAX = Medicaid Analytic eXtract; Alpha-MAX = Alpha Medicaid Analytic eXtract; IPUMS = Integrated Public Use Microdata Sample

Table A.3. Domain 3 research questions and approaches for the interim evaluation: Beneficiary engagement programs to encourage health behaviors

Analytical approach	Outcome measure	Data sources	Demonstration states	Comparison states	Crosswalk to original evaluation design plan for Domain 3
1. What strategies are states using to educate beneficiaries about preferred health behaviors?					
1a. What strategies are states using to explain incentives and disincentives? Which are perceived to be effective?					
Narrative and synthesis of state-reported data and rapid-cycle reports	Mode, content, timing, and other aspects of education materials	State evaluation reports, survey and focus group data, rapid-cycle reports	Indiana, Iowa, Michigan	N/A	Research Question 1a
2. To what extent are Medicaid enrollees responsive to explicit program incentives?					
Descriptive analysis (including regressions) of incentivized behavior completion	Receipt of wellness visit Time to completion of wellness visits	Administrative data from demonstration states, MAX and Alpha-MAX	Iowa, Michigan	Oregon, Washington	Refinement of outcome measures for Research Question 2a; descriptive analysis includes regression
Descriptive analysis of incentivized behavior completion by demographic characteristics	Receipt of wellness visit	Administrative data from demonstration states, MAX and Alpha-MAX	Iowa, Michigan	Oregon, Washington	Refinement of outcome measures for Research Question 2a
Descriptive analysis of health risk assessment completion	Completion of health risk assessment	Administrative data from demonstration state	Iowa[a]	N/A	Refinement of outcome measures for Research Question 2a
Synthesis of state findings on health account utilization	State-reported metrics on account awareness and utilization	State evaluation reports and surveys	Indiana, Michigan	N/A	Research Question 2a

TABLE A.3 (CONTINUED)

3. How do the incentives affect overall access to and use of care?					
3a. Which behavior incentives yield the greatest relative gains in preventive care and chronic care management?					
Descriptive analysis (including regressions) of preventive service receipt given financial incentive for health behavior	Receipt of specific preventive services Completion of all recommended health behaviors for age and sex Time to completion of all recommended preventive services for age and sex	Administrative data from demonstration states, MAX and Alpha-MAX	Iowa, Michigan	Oregon, Washington	Refinement of outcome measures for Research Question 3a
Descriptive analysis (including regressions) of chronic condition management given financial incentive for health behavior	Adherence to recommended chronic care regimen (Core Set of Adult Health Care Quality Measures for Medicaid-Eligible Adults)	Administrative data from demonstration states, MAX and Alpha-MAX	Iowa, Michigan	Oregon, Washington	Refinement of outcome measures for Research Question 3b
Descriptive analysis of preventive care receipt and chronic condition management by demographic characteristics	Receipt of specific preventive services Adherence to recommended chronic care regimen (Core Set of Adult Health Care Quality Measures for Medicaid-Eligible Adults)	Administrative data from demonstration states, MAX and Alpha-MAX	Iowa, Michigan	Oregon, Washington	Refinement of outcome measures for Research Questions 3a and 3b
Descriptive analysis of preventive service receipt or chronic condition management as function of health risk assessment completion	Receipt of wellness visit Receipt of specific preventive services Completion of all recommended health behaviors for age and sex Adherence to recommended chronic care regimen (Core Set of Adult Health Care Quality Measures for Medicaid-Eligible Adults)	Administrative data from demonstration state	Iowa[a]	N/A	Refinement of outcome measures for Research Questions 3a and 3b

TABLE A.3 (CONTINUED)

3b. Which behavior incentives yield the greatest reductions in disincentivized care (i.e., non-emergent ED visits)?					
Descriptive analysis (including regressions) of non-emergent ED utilization given incentive for health behavior	Flag for any non-emergent ED visit Count of non-emergent ED visits	Administrative data from demonstration states, MAX and Alpha-MAX	Iowa, Michigan	Oregon, Washington	Research Question 3c
4. Are population-level effects observed from Medicaid demonstration policies?					
Regression analysis of population-level effects of Medicaid expansion and incentives	Preventive service receipt Smoking cessation Physical activity A1C checked in past 12 months Diabetes-related physician visit in past 12 months	BRFSS[b]	Indiana, Iowa, Michigan	Arkansas, Kentucky, Nevada, New Mexico, North Dakota, Ohio, Oregon, Pennsylvania, Washington, West Virginia	Research Questions 3a and 3b

ED = emergency department; MAX = Medicaid Analytic eXtract; Alpha-MAX = Alpha Medicaid Analytic eXtract; BRFSS = Behavioral Risk Factor Surveillance System; USPSTF = United States Preventive Services Task Force; HRA = Health Risk Assessment

[a] Individual-level data on HRA completion are not available in MAX and Alpha-MAX, so we cannot include Michigan in this analysis.

[b] Chronic condition management questions are generally contained in the optional BRFSS modules. All three demonstration states fielded the diabetes module; however, use of the other chronic condition modules varied.

Table A.4. Research questions and analytic approaches deferred until the final evaluation

Research question from original design report	Outcome measure	Data sources	Rationale for deferring to final evaluation
Domain 1: Medicaid-supported enrollment in QHPs (premium assistance)			
1b. Does provider participation improve under premium assistance[a]?	Number of providers contracted to provide services to Medicaid population Percentage of providers taking new patients	QHP and state MCO contracts outlining access standards State reports on provider participation TMSIS provider file	Contracts and T-MSIS provider files are not available. States have not consistently analyzed changes in provider participation.
1c. What is the unmet need for medical care[a]?	Percentage self-reporting: A personal doctor or health care provider Unmet medical need Length of time since last routine doctor visit	National Adult Medicaid CAHPS	National Adult Medicaid CAHPS data are not yet available for analysis.
1d. Is there continuity of coverage between Medicaid and Marketplace coverage[a]?	Counts of beneficiaries moving directly from Medicaid to Marketplace coverage with the same health plan, and the reverse	Administrative data from demonstration states	Data to monitor transitions from Medicaid to Marketplace plans are not available.
2b. How do premium assistance states compare in terms of states' administrative costs?	Growth in administrative costs: From 2013 to 2014 (initial infrastructure expansion costs) From 2014 onward	State reports on costs CMS-64 expenditure data	CMS-64 data are not sufficiently granular; data will need to be collected directly from states.
Domain 2: Premiums and other financial contributions (monthly payments)			
1c. How does a requirement to make payments to complete enrollment, as compared to paying after an initial period of enrollment, affect take-up?	Proportion of likely eligible population enrolled in coverage (annual)	State and enrollment data and MSIS; IPUMS	Indiana is the only state that requires a payment to complete enrollment, and we do not have administrative data from Indiana.
2b. Is there a relationship between monthly payment requirements and renewals[a]?	Renewed enrollment rates by change in required payment amounts (no change, increase, decrease over previous year)	Administrative data from demonstration states	Accurate historical income data are not available for the interim evaluation.
2c. What is the effect of payment enforceability rules such as "lock-out" periods before re-enrollment?	Percentage of beneficiaries returning to program after disenrolling, by reason for disenrollment and length of enrollment gap	Administrative data from demonstration states	Lock-out policy is applicable only in Indiana. Longer observation period is needed to observe substantial re-enrollments in appropriate comparison state (Montana).

TABLE A.4 (CONTINUED)

Research question from original design report	Outcome measure	Data sources	Rationale for deferring to final evaluation
Domain 3: Beneficiary engagement programs to encourage health behaviors			
1b. If qualitative information suggests successful education strategies, what is the effect of mode, content, and/or timing of education?	Rates of incentivized preventive and chronic care, stratified by beneficiaries' exposure to different educational strategies	Administrative data from demonstration states	Insufficient information is available on educational efforts and relationship to beneficiaries' understanding
3b. How do program incentives affect volume of and access to care?	Volume of care by category (primary care, specialty care, prescriptions), distinguishing chronic and nonchronic care	Administrative data from demonstration states	Administrative data from Indiana are not available at this time, and Indiana is the only demonstration state with strong incentives to limit the overall volume of care
	Flag for reaching cost-sharing limit and time to reach cost-sharing limit	Administrative data from demonstration states	Beneficiary cost-sharing data are not available.
	Percentage self-reporting: A personal doctor or health care provider Unmet medical need Length of time since last routine doctor visit	National Adult Medicaid CAHPS	National Adult Medicaid CAHPS data are not yet available for analysis.
5. What administrative costs do states with healthy behavior incentive programs incur to establish and maintain these programs?	Initial and ongoing costs of administration, scaled to PMPM	Key informant interviews	No information is currently available, and we would need to address the question in a rapid-cycle report to collect information.

QHP = Qualified Health Plan; MCO = Managed Care Organization; T-MSIS = Transformed Medicaid Statistical Information System; CAHPS = Consumer Assessment of Healthcare Providers and Systems; CMS = Centers for Medicare & Medicaid Services; PMPM = per member per month

[a] Question will be partially addressed with other data sources and analyses in the interim evaluation. Only analyses presented here are deferred to the final evaluation.