Social & Scientific Systems, Inc.
Improving Public Health Worldwide

# Evaluation Design Report for Indiana HIP 2.0 Federal Evaluation

**Report Date:** May 22, 2017

**Prepared for:**

Centers for Medicare & Medicaid Services

Brenda Blunt, MSN, RN
Division Director
Division of Demonstration Monitoring and Evaluation
State Demonstration Group
Center for Medicaid and CHIP Services

Teresa DeCaro, RN, MS
Deputy Director of Operations, Monitoring and Evaluation
State Demonstrations Group
Center for Medicaid and CHIP Services

**Submitted by:**

Social & Scientific Systems, Inc.

# Authorship

Chapters I and II were written by Social & Scientific Systems, Inc. (SSS) and the Urban Institute.

Chapters III and IV were written by the Urban Institute.

## Table of Contents

# I. Introduction

In January 2015, Indiana received approval from the Centers for Medicare & Medicaid Services (CMS) to implement a new Section 1115 demonstration allowing for its Medicaid expansion under the Affordable Care Act (ACA)—the Healthy Indiana Plan (HIP) 2.0. Enrollment in HIP 2.0 began on February 1, 2015, and included some individuals who were previously eligible for Medicaid. As of June 2015, some 275,000 individuals were enrolled in HIP 2.0, including individuals who had previously been enrolled in Medicaid prior to HIP 2.0. Enrollment in HIP 2.0 is expected to eventually reach approximately 350,000 newly eligible beneficiaries.

The HIP 2.0 demonstration built on Indiana's existing Medicaid managed care program and its 2007 Section 1115 demonstration, HIP 1.0. HIP 2.0 is an innovative approach to Medicaid expansion, containing elements of personal responsibility through the use of monthly contributions, cost sharing, and strategies to promote healthy behaviors and a reliance on the private insurance market through Medicaid managed care plans and a premium assistance program. HIP 2.0 includes some provisions not included in earlier Medicaid expansions, such as (1) a high-deductible health plan (HDHP) paired with a Personal Wellness and Responsibility (POWER) account; (2) "lockouts" of some newly eligible individuals who do not pay their monthly POWER account contributions within a grace period from re-enrolling in coverage; (3) $25 copays under certain circumstances for non-emergent use of the emergency room (ER); and (4) optional POWER account contributions and enhanced benefits to newly eligible individuals with very low incomes. In addition, the HIP 2.0 demonstration includes a waiver of non-emergency medical transportation (NEMT) services. Understanding how HIP 2.0 affects program beneficiaries is essential to informing Medicaid policymaking moving forward. However, separating the effects of the many program features of HIP 2.0 from the impacts of other factors, including other ongoing health reform initiatives that affect the health care system and its consumers, will be both challenging and critical to informing Medicaid policy.

This Evaluation Design Report outlines our plan for conducting the HIP 2.0 evaluation, which will rely on mixed methods. The robust evaluation design included elements that depended on administrative and claims/encounter data from the State of Indiana (i.e., beneficiary surveys, analyses of claims and encounter data, and focus groups with program enrollees and disenrollees drawn from administrative data); however, these evaluation activities are now on hold, pending availability of the data from the State. The balance of the evaluation will proceed with the qualitative component (i.e., document review, site visits, focus groups, and informational interviews) and the quantitative component (multi-state analyses) using primary data collection and extant data from public sources.

The qualitative component of the evaluation will provide an in-depth understanding of the design and implementation of HIP 2.0, 1) documenting how the different features were implemented, and 2) identifying any important factors that may be contributing to successful operations as well as challenges that may have been encountered during implementation and how they were addressed. The quantitative component of the evaluation will estimate the impacts of HIP 2.0 on key outcomes. Findings from the qualitative and quantitative components will feed into the evaluation's 2 Interim Reports and the Summative Evaluation Report. Evaluation results will also be presented through a series of Webinars conducted in conjunction with the Interim and Summative Evaluation Reports.

# II. Overview of Indiana HIP 2.0 and the HIP 2.0 Evaluation

## A. Indiana HIP 2.0

As mentioned, HIP 2.0 builds on Indiana's previous 1115 demonstration, HIP 1.0. Under HIP 2.0, Indiana is maintaining POWER accounts from HIP 1.0, which are administrated by Medicaid managed care plans and funded by the state and, in HIP Plus (see below), funded partially by beneficiaries who pay monthly contributions on a sliding scale equal to 2 percent of their income or $1/month, whichever is greater. Individuals above 100 percent federal poverty level (FPL) are required to pay monthly contributions within a 60-day grace period or are disenrolled and locked out of the program for 6 months. While other states (Arkansas, Michigan, and Iowa) with alternative Medicaid expansions impose regular contributions, Indiana's 1115 waiver is the first in this group with such a lockout provision. Similarly, among other Medicaid expansion states, Indiana is the first to receive approval to charge optional monthly contributions to individuals at or below 50 percent FPL.

Depending upon a beneficiary's income, eligibility group, and POWER account contribution, 4 benefit packages are available to HIP 2.0 enrollees:

- **HIP Plus**. All HIP 2.0 enrollees are eligible for HIP Plus if they make monthly contributions to a POWER account. HIP Plus enrollees are not charged copayments except for nonemergency use of an ER under certain circumstances. HIP Plus enrollees receive dental and vision coverage in addition to all of the ACA's essential health benefits.
- **HIP Basic**. A more basic benefit package than HIP Plus, HIP Basic excludes dental and vision coverage for those 21 and older but covers all the ACA's essential health benefits. It is available to beneficiaries who do not make monthly contributions to a POWER account within the 60-day grace period, and who are at or under 100 percent FPL or otherwise exempt from being locked out of HIP 2.0. HIP Basic enrollees are responsible for paying copayments allowed under standard Medicaid rules, and are also subject to the copayment for non-emergency ER use. The total amount charged for cost-sharing under HIP Basic may not exceed 5 percent of household income.
- **HIP Link**. All newly eligible beneficiaries age 21 and older who have access to a qualifying employer-sponsored insurance plan are eligible for, but are not required to enroll in, HIP Link, with the state providing premium and cost-sharing assistance to lower the out-of-pocket costs of employer-sponsored coverage.
- **State Plan**. The Indiana Medicaid state plan benefit package is available to newly eligible, medically frail individuals, as well as previously eligible low-income parents and caretakers.

As mentioned, HIP 2.0 allows the state, for the first 2 years of the demonstration, to impose copayments above amounts allowed in federal regulations for recurring non-emergency ER use, another new feature among alternative Medicaid expansion waivers. After the first non-emergency visit (for which an $8 copay is imposed), Indiana can charge $25 per visit for subsequent non-emergency ER use. Beneficiaries who contact their health plan's 24-hour nurse hotline before going to the ER will not be subject to this charge. To evaluate this particular feature of the demonstration, as part of its waiver and pursuant to

federal statutory requirements for waivers of Medicaid cost-sharing, Indiana has created a control group of beneficiaries who will be charged an $8 copay for all non-emergent ER visits (i.e., not subject to the graduated copay of $25 for each subsequent non-emergency ER visit). In addition, for at least the first year of the demonstration. In addition, Indiana can waive NEMT for most newly eligible adults.

### B. Overview of Indiana HIP 2.0 Federal Evaluation

There are 4 key goals for the federal evaluation of Indiana's HIP 2.0:

1. Understand the design, implementation, and administrative costs of HIP 2.0;
2. Estimate the impacts of HIP 2.0 on health insurance coverage, access to and use of health care, quality of health care, health care affordability, and health and health behaviors;
3. Document beneficiary understanding of and experiences with HIP 2.0, including experiences with POWER accounts and enrollment and disenrollment; and
4. Provide information on HIP 2.0 that can inform CMS, Indiana, and other states as they consider ways to improve the Medicaid program.

In meeting these goals, the HIP 2.0 evaluation will focus on 2 components—qualitative analyses and impact analyses. We describe our approach to each component of the evaluation in turn.

## III. Qualitative Analyses

The evaluation's qualitative analyses are intended to provide careful documentation of HIP 2.0 implementation and operations, as well as the successes and challenges faced in managing the demonstration. The qualitative analyses will also provide an in-depth assessment of HIP 2.0 experiences from the consumer perspective. In addition, these analyses will inform both the descriptive and impact analyses in the evaluation's quantitative components, guiding them and providing valuable context for interpreting results.

The qualitative analyses will examine three research questions:

- How were different components of HIP 2.0 implemented?
- What were successes and challenges with administering HIP 2.0?
- What were enrollees' understanding and experience with HIP 2.0?

To address these questions, we will collect and analyze a range of qualitative data. This will include information derived from HIP 2.0 materials and related documents, and site visits as well as informational interviews with key stakeholders and consumer focus groups.

### A. Data Sources

#### 1. Document Review

We will collect and review publicly available documents produced by the State of Indiana about HIP 2.0, as well as other materials provided to us by either the state or CMS, or what we find through other background research efforts. We will, for example, review Indiana's waiver application, planning

documents, findings produced from the HIP 1.0 evaluation and other "grey literature," as well as administrative data such as state financial records. Throughout the evaluation, we will also review new documents pertaining to HIP 2.0 as they become available, including findings produced from Indiana's HIP 2.0 evaluation and other materials made available to us either by the state or CMS. In addition, we will regularly view Indiana's HIP 2.0 website (http://www.in.gov/fssa/hip/index.htm) for pertinent documents. We will also monitor new articles and research reports published on HIP 2.0 as well as major health policy developments in Indiana that may affect the demonstration.

This document review will support our development of an analytical framework of major HIP 2.0 design features, policy variations, and implementation issues. It will also inform our preparation for conducting informational interviews and consumer focus groups (described below), and help us to develop and tailor our data collection instruments for these activities. Finally, the document review will help guide the quantitative analyses, discussed in detail below.

## 2. Site Visits

We will conduct up to 2 site visits to Indiana over the course of the evaluation period. Subject to approval from CMS, the first (round 1) will be conducted in 2017 and the second (round 2) in 2018. The first visit will provide information about stakeholders' and consumers' view of HIP 2.0 roughly half way through the demonstration period, whereas the second visit will provide information about a mature HIP 2.0, just before the demonstration is set to expire. Site visits will include informational interviews with a variety of stakeholders (described below) and focus groups with various HIP 2.0 enrollees and disenrollees.

### *Informational Interviews*

To gain a broad perspective on HIP 2.0, we will conduct informational interviews with individuals representing a range of roles, functions, and interests of relevance to HIP 2.0. They will include at least 4 major types of stakeholders:

- State of Indiana officials,
- HIP 2.0 health plan administrators,
- Health care industry representatives, and
- Consumer and patient advocates.

We will conduct interviews with up to 25 stakeholders per site visit. Most interviews will be conducted in person, but we expect that some may need to be conducted by telephone due to scheduling conflicts or in cases when an important stakeholder is not located in Indianapolis, Gary, or a rural area to be determined where the site visits will potentially take place. We expect that about one-third of the interviews will be with state officials and government staff, and the balance with other HIP 2.0 stakeholders. Key among our non-state interviewees will be stakeholders who can speak about HIP 2.0 implementation in rural parts of the state. Given that our site visits will potentially be confined to Indianapolis, Gary, or a rural area to be determined, some of these informational interviews will likely be conducted by phone.

In the first site visit, we will concentrate on developing our understanding of the design and implementation of HIP 2.0. We will also ask about implementation progress, challenges, and lessons learned to date. The second site visit, scheduled for 2018, will gather information on ongoing implementation progress, challenges, and lessons learned under a more mature program implementation. We will also obtain perceptions of the impacts of the HIP 2.0 from state officials and other stakeholders during the second round of site visits.

### *Protocol Development*

In anticipation of the planned 2017 site visit, we developed a core, semi-structured protocol that will be customized for each of the 4 types of informational interviews we will conduct. **Table III-1** provides the major topics we expect to address during the first site visit by type of interviewee. Included are questions about HIP 2.0 implementation, public education, public awareness about HIP 2.0, HIP 2.0 eligibility, enrollment systems and processes, POWER accounts and enrollee cost-sharing, non-emergency transportation and access to non-emergency care, ER copayments, HIP 2.0 administrative costs, accomplishments and challenges, and lessons learned.

We will update this protocol for the second site visit in which, as mentioned, we will focus on a more developed HIP 2.0 demonstration and assess progress made, challenges faced, and lessons learned. In addition, we will explore how interviewees perceive the operations and effectiveness of the more mature HIP 2.0 program.

**Table III-1. Site Visit Interview Topic Areas by Type of Informational Interviewee, Round 1**

| Topic Areas | State Officials | Health Plans | Providers & Medical Associations | Consumer/Patient Advocates |
|---|---|---|---|---|
| Respondent involvement with HIP 2.0 | X | X | X | X |
| HIP 2.0 implementation, accomplishments, and challenges | X | X | X | X |
| Raising public awareness/public education | X | X | X | X |
| HIP 2.0 eligibility and enrollment processes and systems | X | X | | X |
| POWER accounts and cost-sharing | X | X | X | X |
| Dental and vision service use and coverage processes in HIP 2.0 | X | X | X | X |

| Table III-1. Site Visit Interview Topic Areas by Type of Informational Interviewee, Round 1 | | | | |
|---|---|---|---|---|
| Emergency room copayments | X | X | X | X |
| Administrative costs of HIP 2.0 | X | X | X | |
| HIP 2.0 lessons learned | X | X | X | X |

### *Informational Interview Procedures*

Informational interview procedures will be reviewed and approved by the Urban Institute's Institutional Review Board (IRB). Using our customized semi-structured protocols, our interviews will begin by stating the purpose of the evaluation; reviewing our evaluation goals, funding source, and procedures for keeping subjects' identities anonymous and confidential; and obtaining informed consent to proceed. Two Urban Institute researchers will attend each interview. A senior Urban Institute researcher will lead all interviews, while a research assistant will take detailed notes on an encrypted, password-protected laptop. In addition, if the interviewee agrees to be recorded, we will use a digital recorder to create an audio recording of the interviews. We will explain to each interviewee that the recording will only be used to confirm or clarify our written notes and will not be shared with anyone outside of the research team. We will also inform interviewees that they can terminate the interview at any time or skip any question. Upon completion of each site visit and our return to Urban Institute's offices, audio recordings and rough notes from interviews will be downloaded off secure Urban Institute laptops and saved to the Secure Data Center maintained by SSS, hereafter referred to as the "SSS-SDC." All audio recordings and interview notes will be securely stored for up to 1 year after the project ends and will then be destroyed.

## 3. Focus Groups

During each of the 2 planned site visits, we will also conduct focus groups with HIP 2.0 enrollees and disenrollees. The focus groups are designed to collect rich information from the perspective of HIP 2.0 enrollees and disenrollees on the demonstration, including their understanding of various aspects of HIP 2.0 as well as their experiences with enrollment, cost-sharing, POWER accounts, seeking and obtaining care through their HIP 2.0 health plan, and overall satisfaction with the program. Although focus groups cannot provide fully representative feedback, they will greatly enrich the evaluation by capturing the "voices" of adults most directly affected by HIP 2.0 and provide valuable details about their experiences and perceptions. Further, focus group findings will complement other data collection and analysis efforts in the evaluation. A total of up to 24 focus groups will be conducted, up to 12 as part of the first site visit (planned for 2017) and up to 12 as part of the second site visit (planned for 2018).

### *Focus Group Moderator's Guide Development*

In anticipation of a 2017 site visit, a core focus group moderator's guide was developed for use in the first round of focus groups. A range of topics will be covered (**Table III-2**), including information about the respondents, their views on HIP 2.0 marketing and outreach, eligibility determination, enrollment

and renewal under HIP 2.0, HIP 2.0 monthly contributions and cost-sharing, access to care and benefits under HIP 2.0, how HIP 2.0 may have affected daily life, and overall satisfaction with coverage. We expect that many of the same topics will be covered in the second round of focus groups.

**Table III-2. General Consumer Focus Group Discussion Topics, Round 1**

| Consumer Focus Group Topics |
|---|
| • Respondent characteristics<br>• Marketing and outreach<br>• Eligibility determination, enrollment, and renewal<br>• Monthly contribution and cost-sharing<br>• Access to care and benefits<br>• HIP 2.0 overall impacts on daily life<br>• Overall satisfaction |

### *Focus Group Procedures*

#### *Participant Recruitment*

We will conduct focus groups of HIP 2.0 enrollees as part of the 2 site visits to be conducted under the HIP 2.0 evaluation. In each round, approximately 8 weeks before each site visit, the Urban Institute will work with Briljent to connect with community partners in Indiana (such as organizations that provide health care and other resources to low-income populations) to distribute information about the focus groups to potentially eligible individuals, including a phone number to call if they are interested in participating. Apart from being currently or previously enrolled in either HIP Plus or Basic, individuals will also meet the following criteria:

- Adult enrollees (ages 19–64 years),
- For current enrollees—enrolled in HIP 2.0 (Basic or Plus) for at least 4 months at the point in time when recruited,
- For disenrollees—were disenrolled from HIP 2.0 (Plus) for non-payment of their monthly contribution,
- Lives within selected locations in the city of Indianapolis, Gary, and a rural area to be determined where focus groups will be held,
- Primary language is English for English focus groups,
- Primary language is Spanish for Spanish focus groups.

Briljent will screen each interested person who calls for these criteria and will request the following information be provided: name, HIP enrollment category (Basic or Plus), enrollment time period, and contact information (phone number and, if available, email address).

As currently planned, during each site visit, we will convene up to 12 focus groups—up to 4 groups with HIP Plus enrollees, up to 4 groups with HIP Basic enrollees, up to 2 groups with persons who failed to pay their monthly contribution within the 60-day grace period and were disenrolled and locked out of the program for 6 months, and up to 2 groups with Spanish-speaking HIP 2.0 enrollees. Each focus group will include approximately 8–10 participants. However, to account for the likelihood that some people who sign up for the focus group may not show up, we will recruit a total of 12–13 participants for each of the 4 focus groups.

Focus groups may be held in Indianapolis, Gary, and an additional rural location in Indiana to be determined. Decisions around focus group locations and the addition of Spanish focus groups will be made in consultation with CMS. All materials for Spanish focus groups will be translated by a certified translator, and native Spanish speakers will conduct the recruitment screening calls and focus group facilitation. Given the number of focus groups, conducting most of them in English and in Indianapolis (roughly 22 percent of HIP 2.0 enrollees live in Marion County, where Indianapolis is located)[1] will be the most efficient way to collect valid and reliable qualitative information from individuals who represent a relatively large subset of HIP 2.0 enrollees. Because a single focus group could be misleading, it is better to have multiple focus groups with individuals sharing similar characteristics to allow for interpretation of the information collected based on the extent to which themes are consistent within and between groups. However, perspectives from the Indianapolis metropolitan area (or other areas that may be selected) may not be generalizable to other communities in the state—nor are they meant to be generalizable to all enrollees in Indianapolis (or other areas that may be selected). Rather than generalizability to the HIP 2.0 population as a whole, the aim of the focus groups is to collect richer information than possible through other data collection methods. The focus groups will allow better understanding of the detail available by providing examples of existing perspectives.

Briljent, an Indiana-based firm, will be responsible for focus group recruitment and logistics. SSS will provide in the SSS-SDC a secure FTP site at which Briljent can store the information collected as part of the recruitment process for the focus groups. Briljent will work within the SSS-SDC to access the secure site. Urban Institute researchers will provide guidance to Briljent on the recruitment process for the focus groups.

An experienced Briljent recruiter will answer calls from interested individuals using a pre-written recruitment script. Individuals will be recruited by phone until the target number of participants is obtained for each group. During the recruitment process, Briljent will provide participants with information regarding the purpose of the focus group. In addition, participants will be informed that they will receive a $60 gift card to help defray any expenses (e.g., travel or childcare) that they may incur as a result of their participation. Close to the day of the focus group, a trained Briljent recruiter will make follow-up reminder calls and send emails to individuals who agreed to participate in the focus groups, confirming the date, time, and place for the focus groups, and also confirming the individuals' participation.

[1] http://www.in.gov/fssa/ompp/4881.htm

***Focus Group Sessions***

Briljent will secure a focus group venue in the city of Indianapolis, inside Interstate 465, as well as other locations such as Gary or a rural location to be determined if needed. The space will be easily accessible by public transportation and have adequate privacy so a candid discussion can be conducted and recorded without background noise. The venue will include a table, chairs for the focus group participants, facilitator, and note taker, and access to a restroom. Examples of possible meeting space include the Briljent Indianapolis office, a conference room at a Federally Qualified Health Center, or a local library community organization meeting hall.

Each focus group will last approximately 90 minutes (but not more than 2 hours), including time to review the focus group processes and obtain informed consent from participants. An experienced, senior Urban Institute researcher will facilitate each of the 4 focus groups per visit. A junior Urban Institute researcher will take written notes on an encrypted password-protected laptop during the sessions. In addition, if participants agree, we will use a digital audio recorder to create an audio recording of each focus group. Urban Institute will not transcribe the audio files verbatim, but rather use the recordings as back-up, to confirm the notes for accuracy and to clarify any areas where written notes may be unclear. All identifiers will be redacted in interview and focus group notes, and not mentioned in reports we write as part of this study. All audio recordings and focus group notes will be uploaded directly into the SSS-SDC, with access limited to only those project staff with a need to use these data and who have signed a staff pledge of confidentiality. Files will then be deleted from laptops. All Urban Institute staff members who access such data will undergo the necessary training required to work in the SSS-SDC.

The focus group facilitator will lead the discussion following the moderator's guide, which contains broad, open-ended questions to prompt group discussion and response. The goal is for the facilitator to create an environment that allows the group to discuss topics naturally but at the same time, systematically, following the structure of the moderator's guide. This will ensure that each group covers a consistent set of topics, as set out in **Table III-2** above.

## B. Analytic Approach

### 1. Analysis of Informational Interview Notes

Upon completion of each site visit, we will compile and clean notes from our informational interviews in preparation for analysis using qualitative analytic software (e.g., NVivo), which will facilitate organizing the large amounts of information we will have gathered so that major topics, common themes, and contrasting points of view can be readily identified and analyzed on topics of interest that link to our research questions. A custom coding structure for the analytic software, developed for the HIP 2.0 evaluation, will be used. As mentioned, audio recordings of interviews will be used to clarify and confirm our written notes.

### 2. Analysis of Focus Group Notes

After each of the 2 rounds of focus groups, notes taken during the focus groups will be cleaned and organized following the coding scheme developed for the analysis of informational interview data. Notes will be supplemented as needed by audio recordings of focus groups, and verbatim quotes from the notes will be excerpted to augment the analysis. Then, by each topic area, we will assess whether participants' viewpoints reflected a majority opinion, a minority opinion, or an opinion of a single individual.

Analyzed focus group data will then be combined with data from informational interviews. In both our analyses of data from the informational interviewees and the focus groups, findings will be presented in aggregate form only for memorandums, presentations, and reports summarizing evaluation findings. No data will be presented in such a way that individuals can be identified. No personal identifiers will be printed in the conduct of analysis. In addition, any statistical summaries of focus group participant characteristics will be sufficiently aggregated to protect individuals from identification. Finally, information gleaned from document review will be used to further document and describe HIP 2.0 implementation and progress.

## C. Timeline and Products

Several products will result from the evaluation's qualitative analyses. Dedicated memos reporting on the 2 site visits will be prepared. We will also present findings from the qualitative analyses in the 2 Interim Evaluation Reports and the Summative Evaluation Report, and in Webinars. More specifically:

Two memos based on our findings from the site visits will be prepared each year—one summarizing findings from our informational interviews, and one based on our focus group findings. Under the assumption that we are able to conduct the first site visit during the summer of 2017 (as currently planned), we would produce our first 2 draft memos by the fall of 2017. Assuming CMS provides approval for moving forward with the site visit with enough time to plan for and conduct the site visit during the summer of 2017:

- Site visit and focus group findings from the first round would also be presented in the Interim Evaluation Report #1 in September 2017, as currently planned. A Webinar based on the Interim Evaluation Report #1 is expected to be conducted 1 month after submission.
- Memos based on our findings from the second site visit interviews and focus groups will also be prepared. Assuming we conduct the second site visit and second round of focus group approximately 1 year after the first site visit, as currently planned, we would produce a draft memo within 3 months.
- Site visit and focus group findings from the second round of site visits will also be presented in Interim Evaluation Report #2, which we propose to submit in September 2018. A Webinar based on Interim Evaluation Report #2 is expected to be conducted 1 month after submission.
- Findings from the first and second rounds of site visits and focus groups would be included in the Summative Report, which we propose to submit by December 31, 2018. A Webinar based on the Summative Report is expected to be conducted 1 month after submission.

# IV. Impact Analyses

The goal of the impact analyses is to assess the extent to which HIP 2.0 has led to changes in health insurance coverage as well as changes in health care access and use, health care quality, and health behaviors and outcomes. The impact analyses will seek to address 4 core research questions:

- What are the impacts of HIP 2.0 as compared to *not expanding Medicaid eligibility under the ACA*?
- What are the impacts of HIP 2.0 as compared to a Medicaid expansion under the ACA without a waiver?
- What are the impacts of HIP 2.0 as compared to a Medicaid expansion under the ACA with a waiver using different strategies?
- Do the impacts of HIP 2.0 vary for important population subgroups (e.g., by age, income, parent status, geography)?

In addressing the first question, we will provide insights into how the changes under HIP 2.0 compare to estimates of what would have happened if Indiana had not expanded Medicaid. Addressing the second and third questions will provide insights into how the changes under HIP 2.0 compare to estimates of what would have happened if, instead of HIP 2.0, Indiana had implemented the ACA Medicaid expansion without using a waiver or by using a waiver with different expansion strategies, respectively. The estimates of the counterfactuals for what would have happened in Indiana in the absence of HIP 2.0 (discussed below) will be drawn from the actions of the states that followed different paths under the ACA's Medicaid expansion: those states that have not expanded Medicaid, those states that have expanded Medicaid without a waiver, and those states, such as Indiana, that have expanded Medicaid with a waiver.

## A. Data Needs and Sources

The analysis of the overall impacts of HIP 2.0 requires information for residents of Indiana and comparison states on health insurance coverage, health care access and use, health care affordability and quality, and health and health behaviors. Data are needed for the period prior to and following HIP 2.0 implementation for the overall population targeted by HIP 2.0 in Indiana and a similar population in the comparison states, as well as for key population subgroups (e.g., by age, income, parent status, and, where available, geography). We will focus on 2015–2017 as the post-HIP 2.0 period. The pre-HIP 2.0 period will vary across data sources (discussed below), and will range from 2011 to 2013. As is discussed below, sensitivity analyses will be conducted to assess the extent to which differences in the years included in the pre-HIP 2.0 period influence the impact estimates. We will exclude 2014 from the analyses as a transition year associated with the ACA's marketplace roll out and Medicaid expansions in many states. We will also treat 2015, the first year of HIP 2.0, as a transition year for Indiana. For the

population for this analysis, we will focus on low-income adults, ages 21 to 64 years, as they are the core population targeted by HIP 2.0.[2]

To meet these needs, the analysis of the overall impacts of HIP 2.0 will rely on data from 3 federal surveys: the American Community Survey (ACS)[3], the Behavioral Risk Factor Surveillance System (BRFSS),[4] and, if the relevant data are released in time for the evaluation, the Current Population Survey (CPS)[5] (**Table IV-1**). The ACS, which provides the largest state samples for assessing health insurance coverage of any federal survey, will be used to examine changes in health insurance coverage and self-reported health status. The BRFSS, which provides a richer set of outcome measures for relatively large state samples, will be used to examine changes in health care access and affordability, quality of health care, and health behaviors and health outcomes.[6] Finally, the CPS, which primarily collects data on labor force issues, will be used to address 2 outcomes not available in the ACS or BRFSS—changes in continuity of health insurance coverage over the year and out-of-pocket health care spending.

The pre-HIP 2.0 periods will vary across the three surveys. For the ACS and BRFSS, the pre-HIP 2.0 period will cover 2011–2013, although not all questions are asked in all years in the BRFSS. In particular, Indiana included a new optional module with additional health care access and affordability questions in 2013, and may or may not include that optional module in future years of the survey.[7] For the CPS, which had a major change in the health insurance questions in the 2014 survey (which provides data for 2013), the pre-HIP 2.0 period will be limited to 2013. We are proposing to include follow-up data through 2017 for parts of the analysis in order to be able to address key outcomes, although we acknowledge that will require a very rapid turnaround between data release in late summer 2018 and the preparation of the draft final report by November 2018.

[2] For consistency across the surveys, we will exclude from the analysis individuals who live in group quarters or are active duty military. Where possible, we will also exclude pregnant women.
[3] For more information on the ACS, see https://www.census.gov/programs-surveys/acs/.
[4] For more information on the BRFSS, see http://www.cdc.gov/brfss/.
[5] For more information on the CPS, see http://www.census.gov/programs-surveys/cps.html. There were significant modifications to the health insurance questions in the CPS in 2014 (which provides data for calendar year 2013), including the addition of measures of monthly coverage. As of yet, the new, more detailed data have not been released.
[6] We will rely on measures from the core BRFSS questionnaire as well as questions from BRFSS optional modules, as long as Indiana and at least some of the comparison states participate in those optional modules over the study period.
[7] Indiana will decide on the optional modules to be included in the 2017 BRFSS in October. If Indiana does not include the health care access optional module in the 2017 BRFSS, we will consider adding analyses using the National Health Interview Survey (NHIS) to the evaluation. The NHIS has the advantage of a rich set of health care access and use measures but much smaller state sample sizes than the BRFSS. For example, the sample size for all persons in the NHIS is only about 1,600 per year.

| Table IV-1. Outcome Measures for Overall Impacts of HIP 2.0 | | |
|---|---|---|
| **Outcomes To Be Examined** | **Examples of Empirical Measures (not all measures are available from all data sources)** | **Primary Data Sources** |
| Health insurance coverage | Current health insurance status; Type of health insurance coverage; Churning in health insurance coverage over the past 12 months | ACS, CPS |
| Access to and use of health care | Has a personal doctor; Had a routine checkup in the past 12 months; Had a dental care visit in the past 12 months | BRFSS |
| Barriers to obtaining health care, including barriers due to costs of care and transportation | Delayed getting needed care due to difficulty getting an appointment in the past 12 months*; Delayed getting needed care due to a lack of transportation in the past 12 months*; Went without needed doctor care due to cost in the past 12 months | BRFSS |
| Health care spending and health care affordability | Out-of-pocket health care spending (including for POWER account contributions) over the past 12 months; Medical debt* | BRFSS, CPS |
| Quality of health care | Receipt of preventive services (flu shots, cancer screenings) in the past 12 months; Satisfaction with care over the past 12 months* | BRFSS |
| Health behaviors and health outcomes | Self-reported health status; Days in which physical or mental health was "not good"; Tobacco use | BRFSS |

*Based on questions from the BRFSS health care access optional module, which was fielded by Indiana in 2013 and has not yet been fielded in the post HIP 2.0 period.

## B. Analytic Approach

### *Evaluation Framework: Difference-in-Differences Models*

The analysis of the overall impacts of HIP 2.0 will rely on a quasi-experimental difference-in-differences (DD) framework that uses a comparison group to provide an estimate of the counterfactual for what would have happened in Indiana in the absence of HIP 2.0.[8] We will consider three scenarios for the counterfactual: (1) what would have happened if Indiana had not expanded Medicaid under the ACA; (2)

[8] Difference-in-differences models are a standard approach for assessing policy and program changes when random assignment experiments are not possible, including other CMS evaluations. For example, the Urban Institute research team for the HIP 2.0 evaluation is currently using DD methods as part of the evaluations of State Innovation Models (SIM) Initiatives (with RTI), state Financial Alignment Initiatives (with RTI), and as part of a Robert Wood Johnson Foundation-funded evaluation of the ACA.

what would have happened if Indiana had expanded Medicaid under the ACA without using a waiver; and (3) what would have happened if Indiana had expanded Medicaid under the ACA using different strategies. **Table IV-2** summarizes the broad list of states to be considered as part of the comparison group for each of the counterfactuals. As discussed further below, the ability to match Indiana to other similar states will be limited by the states available within each counterfactual group.

In addition to considering the full set of possible comparison states for each counterfactual, we will also examine subgroups of those states that more closely match Indiana in the pre-HIP 2.0 period. For the analyses that rely on the BRFSS and CPS, where we are not able to identify sub-state areas, the matching will be limited to state-level measures for the pre-HIP 2.0 period, focusing on the states that are most similar, with respect to Medicaid income eligibility levels for parents and childless adults and to the trends in health insurance coverage rates for adults in the pre-HIP 2.0 period. For the analyses that rely on the ACS, where we do have access to data for sub-state areas, we will match on the above factors, as well as local area characteristics, including characteristics of the local population (e.g., proportion with a college degree), the local economy (e.g., local unemployment rate), and local health care system (e.g., primary care physicians per 10,000 population) during the pre-HIP 2.0 period. The resulting groups of comparison states (for BRFSS and CPS) and comparison communities (for ACS) that are a closer match to Indiana in the pre-HIP 2.0 period will be used as a second set of comparison areas.

**Table IV-2. Comparison Groups for Overall Impacts of HIP 2.0**

| Counterfactual | Definition of Comparison Group | Preliminary List of Potential Comparison States |
|---|---|---|
| What if: Indiana expanded Medicaid under the ACA without a waiver | Similar persons in states that expanded Medicaid under the ACA without a waiver in January 2014 or later | AK, AZ, CO, DE, IL, KY, LA, MA, MD, ND, NM, NV, NY, OH, OR, RI, VT, WV |
| What if: Indiana expanded Medicaid under the ACA with different strategies | Similar persons in states that expanded Medicaid using different strategies in January 2014 or later | AR, IA, MI, MT, NH, PA |
| What if: Indiana did not expand Medicaid under the ACA | Similar persons in states that have not expanded Medicaid under the ACA as of the follow-up period for the study | AL, FL, GA, ID, KS, ME, MO, MS, NC, NE, OK, SC, SD, TN, TX, UT, VA, WI, WY |

*Note*: The early expansion states are excluded from the analysis since the early expansion would contaminate the pre-HIP 2.0 period. The set of comparison states may change over time as states change their ACA expansion decisions.

Once we have identified the group of comparison areas (either states or communities) for each counterfactual, we will identify individuals in those areas who are similar to individuals in Indiana using propensity score weighting. By reweighting the comparison group to more closely match the characteristics of the Indiana sample, the goal is to reduce the potential for omitted variable bias in the impact estimates due to unmeasured differences between the 2 groups. Under this approach, we would estimate models that compare Indiana enrollees to the comparison area samples as a function of the

observable demographic and socioeconomic characteristics of the individual and his/her family and, for the ACS analysis, the characteristics of his/her community. **Table IV-3** provides a preliminary list of the explanatory variables to be included in the propensity score models. In addition to including these measures, we will also include interactions between these measures to capture as many of the differences as possible between the populations in Indiana and the comparison states.

Using the estimates from the regression models, we will estimate the propensity score (PS) for each individual in the sample (i.e., the predicted probability that the individual is from Indiana). By using inverse probability weighting based on the propensity scores [defined as PS/(1-PS)], residents of the comparison states who are more similar to Indiana residents receive larger weights, while those who are less similar to Indiana residents receive lower weights. The propensity score reweighting pulls the distribution of weighted comparison group members closer to that of Indiana, increasing the comparability between Indiana and its comparison groups. In implementing the reweighting of the comparison groups to match Indiana, we will explore alternative methods, including the use of entropy balancing (Stata command *ebalance*).[9]

**Table IV-3. Preliminary List of Explanatory Variables To Be Included in the Propensity Score Models**

| Explanatory Variable | Survey |
|---|---|
| Age | ACS, BRFSS, CPS |
| Gender | ACS, BRFSS, CPS |
| Race/ethnicity | ACS, BRFSS, CPS |
| Citizenship status | ACS, CPS |
| Speaks English well or very well | ACS |
| Marital status | ACS, BRFSS, CPS |
| Educational attainment | ACS, BRFSS, CPS |
| Presence of children under 18 in the household/family | ACS, BRFSS, CPS |
| Work status | ACS, BRFSS, CPS |
| Household/family size | ACS, BRFSS, CPS |
| Household/family income | ACS, BRFSS, CPS |
| Household owns/rents home | ACS, BRFSS, CPS |
| Household members per room implies crowded housing | ACS |
| Always wears seatbelt in car (proxy for attitudes toward risk) | BRFSS |
| Resides in urban area | ACS |

[9] See J. Hainmueller and Y. Xu. "ebalance: A Stata Package for Entropy Balancing," Journal of Statistical Software, August 2013, Vol. 54, Issue 7.

| Table IV-3. Preliminary List of Explanatory Variables To Be Included in the Propensity Score Models | |
|---|---|
| **Explanatory Variable** | **Survey** |
| Interview month | BRFSS, CPS |
| Interview mode | BRFSS |
| Community characteristics (e.g., population characteristics, economic factors, provider supply) | ACS |

*Note*: The local community will be defined based on the Public Use Microdata Areas (PUMAs) used in the ACS.

The propensity score weighting would be implemented separately for each of the comparison groups and any variations in those comparison groups (e.g., the narrower set of states that are more similar to Indiana in the pre-HIP 2.0 period). This will ensure that we identify individuals who are most similar to Indiana residents within the context of each of the analyses. We will assess the resulting comparison groups by comparing the distribution of the propensity scores and of the covariates between Indiana and the comparison groups to ensure that the resulting distributions are similar (i.e., "balanced"). Observations from the comparison group that have propensity scores that are smaller than the smallest propensity score in the Indiana sample will be excluded from the analysis.

### *Empirical Model and Estimation Approach*

The core empirical model for the DD analysis can be written as:

$$Outcome_{ist} = \beta_1 Y2015_t + \beta_2 Y2016_t + \beta_3 Y2017_t + \beta_4 HIP2_s + \beta_5 (HIP2_s * Y2015_t) + \beta_6 (HIP2_s * Y2016_t) + \beta_7 (HIP2_s * Y2017_t) + \boldsymbol{X}_{ist}\beta_8 + \boldsymbol{Z}_{st}\beta_9 + \varepsilon$$

Where *Outcome* is the outcome of interest for individual *i* in state *s* and time *t*; *Y*2015, *Y*2016, and *Y*2017 are year dummies for the post-HIP 2.0 period relative to the pre-HIP 2.0 period; *HIP*2 takes the value one for individuals from Indiana and is zero for individuals in the comparison group; ***X*** is a vector of individual and family characteristics; and ***Z*** is a vector of area-level variables (for the ACS analyses only). $\beta_5, \beta_6, \text{and } \beta_7$, the coefficients on the interaction terms between *HIP*2 and year, provide the DD estimates of the impact of HIP 2.0 on the outcome in the specific post-HIP 2.0 year. For simplicity, we will estimate ordinary least squares (OLS) models but will also assess the robustness of the findings using alternative functional forms for discrete outcomes (e.g., logit and probit).[10] **Table IV-4** summarizes the outcomes to be examined and the estimation methods that will be used. The variables included in the propensity score models (outlined in **Table IV-4**) would also be included in the regression models as a further control for differences between the residents of Indiana and the comparison states. **Appendix Tables IV-1 to IV-3** provide examples of the tables that will be used to summarize the findings from the

[10] The initial analyses will rely on OLS and logit. For outcomes that are in the tails of the distribution (e.g., rare events that occur for less than 5 percent of the sample or common events that occur for more than 95 percent of the sample) we will also estimate probit models.

impact analyses for the overall population based on OLS models. Similar tables will be prepared for estimates based on alternate estimation methods.

**Table IV-4. Preliminary List of Empirical Measures and Estimation Methods**

| Outcomes | Primary Data Source (Likely availability during study period) | Estimation Methods |
|---|---|---|
| Insurance coverage | | |
| Had health insurance coverage at the time of the survey | ACS (2011–2017) | OLS, logit, and, potentially, probit |
| Had employer-sponsored insurance at the time of the survey | ACS (2011–2017) | OLS, logit, and, potentially, probit |
| Had health insurance coverage for all of the past 12 months | CPS* (2013–2017) | OLS, logit, and, potentially, probit |
| Had health insurance coverage at some point over the past 12 months | CPS* (2013–2017) | OLS, logit, and, potentially, probit |
| Health care access and use | | |
| Has a personal doctor | BRFSS (2011–2017) | OLS, logit, and, potentially, probit |
| Had a routine checkup in the past 12 months | BRFSS (2011–2017) | OLS, logit, and, potentially, probit |
| Had a visit to a doctor or other health professional in the past 12 months | BRFSS (2013, potentially 2017) | OLS, logit, and, potentially, probit |
| Had a dental visit in the past 12 months | BRFSS (2012, 2014, 2016) | OLS, logit, and, potentially, probit |
| **Barriers to obtaining health care** | | |
| Went without needed doctor care because of costs in the past 12 months | BRFSS (2011–2017) | OLS, logit, and, potentially, probit |
| Did not take medication as prescribed because of costs in the past 12 months | BRFSS (2013, potentially 2017) | OLS, logit, and, potentially, probit |
| Lack of transportation was most important reason delayed getting needed medical care in the past 12 months | BRFSS (2013, potentially 2017) | OLS, logit, and, potentially, probit |
| Difficulty getting an appointment was most important reason delayed getting needed medical care in the past 12 months | BRFSS (2013, potentially 2017) | OLS, logit, and, potentially, probit |

| Table IV-4. Preliminary List of Empirical Measures and Estimation Methods | | |
|---|---|---|
| **Outcomes** | **Primary Data Source (Likely availability during study period)** | **Estimation Methods** |
| **Health care spending/health care affordability** | | |
| Had out-of-pocket health care costs greater than $500/$1,000/$2,000 in the past 12 months | CPS (2013–2017) | OLS, logit, and, potentially, probit |
| Has medical bills that are being paid off over time | BRFSS (2013, potentially 2017) | OLS, logit, and, potentially, probit |
| **Quality of care** | | |
| Received flu vaccine in past 12 months | BRFSS (2011–2017) | OLS, logit, and, potentially, probit |
| Satisfied with health care that has been received | BRFSS (2013, potentially 2017) | OLS, logit, and, potentially, probit |
| Had emergency department or urgent care visit for asthma in past 12 months (overall and among those with asthma) | BRFSS (2011, potentially 2017) | OLS, logit, and, potentially, probit |
| **Health behaviors and health status** | | |
| Current smoker/tobacco user | BRFSS (2011–2017) | OLS, logit, and, potentially, probit |
| Tried to quit smoking in past 12 months | BRFSS (2011–2017) | OLS, logit, and, potentially, probit |
| Self-reported health status | BRFSS (2011–2017) | OLS, logit, and, potentially, probit |
| Any days in the past 30 days when physical health was not good | BRFSS (2011–2017) | OLS, logit, and, potentially, probit |
| Any days in the past 30 days when mental health was not good | BRFSS (2011–2017) | OLS, logit, and, potentially, probit |
| Has an activity limitation due to health issues | BRFSS (2011–2017) | OLS, logit, and, potentially, probit |

* The CPS provides data on current insurance coverage and coverage for each of the prior 15 months.

***Sensitivity Analyses***

An important concern with quasi-experimental designs is the possibility of unmeasured differences between Indiana and the comparison groups on dimensions other than the form of the intervention that

are not controlled for in the analysis. If those differences exist and are associated with the outcomes of interest, the impact estimates would be biased. We will minimize such potential bias by controlling for a wide range of measures in the propensity score model (described above) and in the regression analyses, and by estimating models based on different groups of comparison states. We will also explore the impacts of including different years in the pre-demonstration period (e.g., 2011–2013, 2013 only). Findings from the sensitivity analyses would be reported using variations on **Appendix Tables IV-1 to IV-3**. Finally, to assess the scope of any remaining omitted variable bias, we will use "bounding" methods developed by Oster (2015) to examine the potential changes in the impact estimates that would occur if we were able to control for any remaining unmeasured differences between Indiana and the comparison groups.

#### *Subgroup Analyses*

Beyond the analyses of the overall impacts of HIP 2.0, we will examine the impacts of HIP 2.0 on important subgroups of the population, including by age, income, and parent status. The specific subgroups to be examined will be determined by the available data and the sample sizes in each of the surveys. We will also use difference-in-difference-in-differences (DDD) models that include interactions between the HIP2 dummy variable and population subgroups to estimate differences in the impacts of HIP 2.0 across key population groups (e.g., between parents and childless adults, between younger and older adults). The findings here will inform our understanding of heterogeneity in the impacts of HIP 2.0.

**Appendix Tables IV-4 to IV-6** provide examples of the tables that would be used to report the DD estimates (which provide estimating of the impacts for each subgroup separately) and the DDD estimates (which provide estimates of the relative impacts for the different subgroups). The comparison states, model specification, and estimation methods for the subgroup analyses would be informed by the sensitivity analyses conducted for all adults.

**Appendix Table IV-7** provides a preliminary summary of the models to be estimated under this component of the evaluation.

### *Defining Income*

In order to limit the analysis to the population that is targeted by HIP 2.0, we will need to estimate the income level for the health insurance unit (HIU) used to determine program eligibility in Indiana. This is a challenge in federal survey data, as the surveys do not always capture all of the information needed to construct the specific eligibility unit and to determine income for that eligibility unit. For the ACS and CPS, the surveys provide detailed household relationship information and individual income information that can be used to approximate the Medicaid HIUs and the income for that unit. For those 2 surveys, we can identify adults in the sample who likely meet the income eligibility standard under the Medicaid expansion of HIU income at or below 138 percent of the FPL, as well as subgroups of that population (e.g., with income between 100 and 138 percent of FPL, with income below 50 percent of FPL). By contrast, the BRFSS only provides information on annual household income and only provides that information by a limited number of categories (e.g., less than $10,000, $10–15,000, $15–20,000, $20–25,000, $25–35,000, $35–50,000, $50–75,000, $75,000 or more). While we will use those data to conduct analyses by income groups (e.g., adults in households with income below $25,000), we will also

use the ability to construct both HIU and household income measures in the ACS to use the ACS as a bridge to impute measures of HIU income relative to poverty in the BRFSS. Specifically, we will use the ACS to estimate regression models of HIU income relative to poverty as a function of household income and characteristics of the individual, including age, sex, race/ethnicity, education, marital status, household size, homeownership, and urban/rural status of place of residence for each year.[11] We will use the coefficients from that model to predict HIU income relative to poverty for each year's BRFSS sample. We will check the imputation process by comparing the HIU distribution in the BRFSS to that of the ACS, and by comparing the characteristics of the adults in the HIUs with income at or below 138 percent of the FPL in the ACS and the BRFSS.[12] For the analyses using the BRFSS, we will estimate models using both the reported household income categories and the imputed HIU income categories.

### *Limitations of the Empirical Approach*

As with all quasi-experimental analyses, we will work to reduce the potential that our impact estimates incorporate omitted variable bias; however, in the absent of random assignment, it is not possible to completely eliminate the potential that omitted variable bias persists. We will use a "bounding" method developed by Oster (2015) to assess the potential scope of any remaining problems. Using Oster's method, we would estimate the potential effect of any omitted variables on the estimated impact of HIP 2.0 under different assumptions about the potential scope of omitted variable bias. If the upper-bound estimates under these different scenarios would lead to the same conclusions as drawn from our core analysis, this would suggest that our results are robust to omitted variable bias. Beyond that basic limitation to the difference-in-differences model, we are also constrained by the available survey data sources, which limit the outcomes and population subgroups that can be examined. Of particular importance, the available survey data will not support the assessment of the impacts of the different components of HIP 2.0, such as the impacts of POWER account contributions and cost-sharing provisions. Further, the federal surveys, as with all surveys, are subject to measurement error, including reporting error by respondents. We would not, however, expect the measurement error in the surveys to differ between Indiana and other states. Finally, it is important to recognize that the timing of this evaluation is fairly early in the demonstration (2015–2017) and, thus, may not capture the ultimate effects of HIP 2.0, were it to continue beyond the demonstration period.

## C. Timeline and Products

Pending the approval of the evaluation design by CMS, the first deliverable for the impact analysis will be a memo on the selection of the comparison groups. Beyond that deliverable, findings from the impact analyses will be included in the Interim Evaluation Reports and the Final Summative Evaluation Report, and in Webinars. More specifically:

[11] The variables to be included in the imputation regression model will be limited to those that are defined consistently across the ACS and BRFSS.

[12] We are currently using this method of relying on the ACS to aid in imputing ACA income categories in the BRFSS under the evaluations of the SIM Initiatives for CMS.

- An overview of the plans for the impact analyses for HIP 2.0 would be included in the first Interim Evaluation Report, which we propose to submit in September 2017. A Webinar based on Interim Evaluation Report #1 is expected to be conducted 1 month after submission.
- Early estimates from the impact analyses for HIP 2.0 would be included in the second Interim Evaluation Report, which we propose to submit in September 2018. A Webinar based on Interim Evaluation Report #2 is expected to be conducted 1 month after submission.
- Final estimates of the impact analyses for HIP 2.0 would be included in the Final Summative Evaluation Report, which we propose to submit by December 2018. A Webinar based on the Final Summative Evaluation Report is expected to be conducted 1 month after submission.

# V. Summary of Appendices

- Supplemental Materials for Chapter IV
  - Appendix IV-1 to IV-6: Examples of Tables
  - Appendix IV-7: Summary of Models to be Estimated

# VI. Appendix Tables for Section IV: Impact Analyses

| **Appendix Table IV-1. Difference-in-Differences Estimates for Outcomes for Indiana Relative to Comparison Groups Based on *States That Did Not Expand Medicaid under the ACA*, All Low-Income Adults, 2011–2017** | | | | | | |
|---|---|---|---|---|---|---|
| **Outcome Measures** | **Model 1: All Relevant States** | | | **Model 2: States That More Closely Match Indiana** | | |
| | **Regression Adjusted Difference in Differences** | **95% Confidence Interval** | | **Regression Adjusted Difference in Differences** | **95% Confidence Interval** | |
| | | **Lower Limit** | **Upper Limit** | | **Lower Limit** | **Upper Limit** |
| Outcome [a] | | | | | | |
| 2015 | | | | | | |
| 2016 | | | | | | |
| 2017 | | | | | | |
| Outcome | | | | | | |
| 2015 | | | | | | |
| 2016 | | | | | | |
| 2017 | | | | | | |
| Outcome | | | | | | |
| 2015 | | | | | | |
| 2016 | | | | | | |
| 2017 | | | | | | |
| Outcome [b] | | | | | | |
| 2015 | | | | | | |
| 2016 | | | | | | |
| 2017 | | | | | | |
| Outcome | | | | | | |
| 2015 | | | | | | |
| 2016 | | | | | | |
| 2017 | | | | | | |
| Outcome | | | | | | |
| 2015 | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2016 | | | | | | |
| 2017 | | | | | | |
| Outcome | | | | | | |
| 2015 | | | | | | |
| 2016 | | | | | | |
| 2017 | | | | | | |

*Note*: The total number of persons for Indiana in 2012 is XX,XXX. Bold estimates indicate statistical significance at the p<0.05 level. An ordinary least squares model was used to obtain the impact estimates. A *negative* value indicates a *greater decrease* or a *smaller increase* in the outcome in the Indiana relative to the comparison group, all else equal. A *positive* value indicates a *greater increase* or a *smaller decrease* in the outcome in Indiana relative to the comparison group, all else equal. All outcomes are from the Behavioral Risk Factor Surveillance System unless noted otherwise.

[a] Outcome is from the American Community Survey; [b] Outcome is from the Current Population Survey.

**Appendix Table IV-2. Difference-in-Differences Estimates for Outcomes for Indiana Relative to Comparison Groups Based on *States That Expanded Medicaid Under the ACA Without a Waiver*, All Low-Income Adults, 2011–2017**

| Outcome Measures | Model 1: All Relevant States | | | Model 2: States That More Closely Match Indiana | | |
|---|---|---|---|---|---|---|
| | Regression Adjusted Difference in Differences | 95% Confidence Interval | | Regression Adjusted Difference In Differences | 95% Confidence Interval | |
| | | Lower Limit | Upper Limit | | Lower Limit | Upper Limit |
| Outcome [a] | | | | | | |
| 2015 | | | | | | |
| 2016 | | | | | | |
| 2017 | | | | | | |
| Outcome | | | | | | |
| 2015 | | | | | | |
| 2016 | | | | | | |
| 2017 | | | | | | |
| Outcome | | | | | | |
| 2015 | | | | | | |
| 2016 | | | | | | |
| 2017 | | | | | | |
| Outcome [b] | | | | | | |
| 2015 | | | | | | |
| 2016 | | | | | | |
| 2017 | | | | | | |
| Outcome | | | | | | |
| 2015 | | | | | | |
| 2016 | | | | | | |
| 2017 | | | | | | |
| Outcome | | | | | | |
| 2015 | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2016 | | | | | | |
| 2017 | | | | | | |
| Outcome | | | | | | |
| 2015 | | | | | | |
| 2016 | | | | | | |
| 2017 | | | | | | |

*Note*: The total number of persons for Indiana in 2012 is XX,XXX. Bold estimates indicate statistical significance at the p<0.05 level. An ordinary least squares model was used to obtain the impact estimates. A *negative* value indicates a *greater decrease* or a *smaller increase* in the outcome in the Indiana relative to the comparison group, all else equal. A *positive* value indicates a *greater increase* or a *smaller decrease* in the outcome in Indiana relative to the comparison group, all else equal. All outcomes are from the Behavioral Risk Factor Surveillance System unless noted otherwise.

[a] Outcome is from the American Community Survey; [b] Outcome is from the Current Population Survey.

**Appendix Table IV-3. Difference-in-Differences Estimates for Outcomes for Indiana Relative to Comparison Groups Based on *Other States That Expanded Medicaid Under the ACA With a Waiver*, All Low-Income Adults, 2011–2017**

| Outcome Measures | Model 1: All Relevant States | | | Model 2: States That More Closely Match Indiana | | |
|---|---|---|---|---|---|---|
| | Regression Adjusted Difference in Differences | 95% Confidence Interval | | Regression Adjusted Difference in Differences | 95% Confidence Interval | |
| | | Lower Limit | Upper Limit | | Lower Limit | Upper Limit |
| Outcome [a] | | | | | | |
| 2015 | | | | | | |
| 2016 | | | | | | |
| 2017 | | | | | | |
| Outcome | | | | | | |
| 2015 | | | | | | |
| 2016 | | | | | | |
| 2017 | | | | | | |
| Outcome | | | | | | |
| 2015 | | | | | | |
| 2016 | | | | | | |
| 2017 | | | | | | |
| Outcome [b] | | | | | | |
| 2015 | | | | | | |
| 2016 | | | | | | |
| 2017 | | | | | | |
| Outcome | | | | | | |
| 2015 | | | | | | |
| 2016 | | | | | | |
| 2017 | | | | | | |
| Outcome | | | | | | |
| 2015 | | | | | | |
| 2016 | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2017 | | | | | | |
| Outcome | | | | | | |
| 2015 | | | | | | |
| 2016 | | | | | | |
| 2017 | | | | | | |

*Note*: The total number of persons for Indiana in 2012 is XX,XXX. Bold estimates indicate statistical significance at the p<0.05 level. An ordinary least squares model was used to obtain the impact estimates. A *negative* value indicates a *greater decrease* or a *smaller increase* in the outcome in the Indiana relative to the comparison group, all else equal. A *positive* value indicates a *greater increase* or a *smaller decrease* in the outcome in Indiana relative to the comparison group, all else equal. All outcomes are from the Behavioral Risk Factor Surveillance System unless noted otherwise.

[a] Outcome is from the American Community Survey; [b] Outcome is from the Current Population Survey.

**Appendix Table IV-4. Difference-in-Differences Estimates for Outcomes for Indiana Relative to Comparison Groups Based On *States That Expanded Medicaid Under the ACA Without a Waiver, Low-Income Parents And Childless Adults*, 2011–2017**

| Outcome Measures | Parents | | | Childless Adults | | | Parents Relative To Childless Adults | | |
|---|---|---|---|---|---|---|---|---|---|
| | Regression Adjusted Difference in Differences | 95% Confidence Interval | | Regression Adjusted Difference In Differences | 95% Confidence Interval | | Regression Adjusted Difference In Difference In Differences | 95% Confidence Interval | |
| | | Lower Limit | Upper Limit | | Lower Limit | Upper Limit | | Lower Limit | Upper Limit |
| Outcome [a] | | | | | | | | | |
| 2015 | | | | | | | | | |
| 2016 | | | | | | | | | |
| 2017 | | | | | | | | | |
| Outcome | | | | | | | | | |
| 2015 | | | | | | | | | |
| 2016 | | | | | | | | | |
| 2017 | | | | | | | | | |
| Outcome | | | | | | | | | |
| 2015 | | | | | | | | | |
| 2016 | | | | | | | | | |
| 2017 | | | | | | | | | |
| Outcome [b] | | | | | | | | | |
| 2015 | | | | | | | | | |
| 2016 | | | | | | | | | |
| 2017 | | | | | | | | | |
| Outcome | | | | | | | | | |
| 2015 | | | | | | | | | |
| 2016 | | | | | | | | | |
| 2017 | | | | | | | | | |
| Outcome | | | | | | | | | |
| 2015 | | | | | | | | | |
| 2016 | | | | | | | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2017 | | | | | | | | | |
| Outcome | | | | | | | | | |
| 2015 | | | | | | | | | |
| 2016 | | | | | | | | | |
| 2017 | | | | | | | | | |

*Note*: The total number of persons for Indiana in 2012 is XX,XXX. Bold estimates indicate statistical significance at the p<0.05 level. An ordinary least squares model was used to obtain the impact estimates. A *negative* value indicates a *greater decrease* or a *smaller increase* in the outcome in the Indiana relative to the comparison group, all else equal. A *positive* value indicates a *greater increase* or a *smaller decrease* in the outcome in Indiana relative to the comparison group, all else equal. All outcomes are from the Behavioral Risk Factor Surveillance System unless noted otherwise.

[a] Outcome is from the American Community Survey; [b] Outcome is from the Current Population Survey.

**Appendix Table IV-5. Difference-in-Differences Estimates for Outcomes for Indiana Relative to Comparison Groups Based On *States That Expanded Medicaid Under the ACA Without a Waiver, Low-Income Parents And Childless Adults*, 2011–2017**

| Outcome Measures | Parents | | | Childless Adults | | | Parents Relative to Childless Adults | | |
|---|---|---|---|---|---|---|---|---|---|
| | Regression Adjusted Difference In Differences | 95% Confidence Interval | | Regression Adjusted Difference in Differences | 95% Confidence Interval | | Regression Adjusted Difference in Difference in Differences | 95% Confidence Interval | |
| | | Lower Limit | Upper Limit | | Lower Limit | Upper Limit | | Lower Limit | Upper Limit |
| Outcome [a] | | | | | | | | | |
| 2015 | | | | | | | | | |
| 2016 | | | | | | | | | |
| 2017 | | | | | | | | | |
| Outcome | | | | | | | | | |
| 2015 | | | | | | | | | |
| 2016 | | | | | | | | | |
| 2017 | | | | | | | | | |
| Outcome | | | | | | | | | |
| 2015 | | | | | | | | | |
| 2016 | | | | | | | | | |
| 2017 | | | | | | | | | |
| Outcome [b] | | | | | | | | | |
| 2015 | | | | | | | | | |
| 2016 | | | | | | | | | |
| 2017 | | | | | | | | | |
| Outcome | | | | | | | | | |
| 2015 | | | | | | | | | |
| 2016 | | | | | | | | | |
| 2017 | | | | | | | | | |
| Outcome | | | | | | | | | |
| 2015 | | | | | | | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2016 | | | | | | | | | |
| 2017 | | | | | | | | | |
| Outcome | | | | | | | | | |
| 2015 | | | | | | | | | |
| 2016 | | | | | | | | | |
| 2017 | | | | | | | | | |

*Note*: The total number of persons for Indiana in 2012 is XX,XXX. Bold estimates indicate statistical significance at the p<0.05 level. An ordinary least squares model was used to obtain the impact estimates. A *negative* value indicates a *greater decrease* or a *smaller increase* in the outcome in the Indiana relative to the comparison group, all else equal. A *positive* value indicates a *greater increase* or a *smaller decrease* in the outcome in Indiana relative to the comparison group, all else equal. All outcomes are from the Behavioral Risk Factor Surveillance System unless noted otherwise.

[a] Outcome is from the American Community Survey; [b] Outcome is from the Current Population Survey.

**Appendix Table IV-6. Difference-in-Differences Estimates for Outcomes for Indiana Relative to Comparison Groups Based on *Other States That Expanded Medicaid Under the ACA With a Waiver, Low-Income Parents and Childless Adults*, 2011–2017**

| Outcome Measures | Parents | | | Childless Adults | | | Parents Relative To Childless Adults | | |
|---|---|---|---|---|---|---|---|---|---|
| | Regression Adjusted Difference In Differences | 95% Confidence Interval | | Regression Adjusted Difference in Differences | 95% Confidence Interval | | Regression Adjusted Difference in Difference in Differences | 95% Confidence Interval | |
| | | Lower Limit | Upper Limit | | Lower Limit | Upper Limit | | Lower Limit | Upper Limit |
| Outcome [a] | | | | | | | | | |
| 2015 | | | | | | | | | |
| 2016 | | | | | | | | | |
| 2017 | | | | | | | | | |
| Outcome | | | | | | | | | |
| 2015 | | | | | | | | | |
| 2016 | | | | | | | | | |
| 2017 | | | | | | | | | |
| Outcome | | | | | | | | | |
| 2015 | | | | | | | | | |
| 2016 | | | | | | | | | |
| 2017 | | | | | | | | | |
| Outcome [b] | | | | | | | | | |
| 2015 | | | | | | | | | |
| 2016 | | | | | | | | | |
| 2017 | | | | | | | | | |
| Outcome | | | | | | | | | |
| 2015 | | | | | | | | | |
| 2016 | | | | | | | | | |
| 2017 | | | | | | | | | |
| Outcome | | | | | | | | | |
| 2015 | | | | | | | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2016 | | | | | | | | | |
| 2017 | | | | | | | | | |
| Outcome | | | | | | | | | |
| 2015 | | | | | | | | | |
| 2016 | | | | | | | | | |
| 2017 | | | | | | | | | |

*Note*: The total number of persons for Indiana in 2012 is XX,XXX. Bold estimates indicate statistical significance at the p<0.05 level. An ordinary least squares model was used to obtain the impact estimates. A *negative* value indicates a *greater decrease* or a *smaller increase* in the outcome in the Indiana relative to the comparison group, all else equal. A *positive* value indicates a *greater increase* or a *smaller decrease* in the outcome in Indiana relative to the comparison group, all else equal. All outcomes are from the Behavioral Risk Factor Surveillance System unless noted otherwise.

[a] Outcome is from the American Community Survey; [b] Outcome is from the Current Population Survey.

**Appendix Table IV-7. Preliminary Summary of Models To Be Estimated**

| Population Groups | Comparison Based on States That Have Not Expanded Medicaid Under the ACA | | | | Comparison Based on States That Have Expanded Medicaid Without a Waiver | | | | Comparison Based on States That Have Expanded Medicaid With Other Individual Contribution and Beneficiary Engagement Waivers | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | State Groups | Pre-Years | Income Measures | Estimation Methods | State Groups | Pre-Years | Income Measures | Estimation Methods | State Groups | Pre-Years | Income Measures | Estimation Methods |
| All low-income adults | All states | 2011–2013 | BRFSS reported and imputed | OLS & probit | All states | 2011–2013 | BRFSS reported and imputed | OLS & probit | All states | 2011–2013 | BRFSS reported and imputed | OLS & probit |
| | | 2013 only | BRFSS reported and imputed | OLS & probit | | 2013 only | BRFSS reported and imputed | OLS & probit | | 2013 only | BRFSS reported and imputed | OLS & probit |
| | Subset of states | 2011–2013 | BRFSS imputed | OLS | Subset of states | 2011–2013 | BRFSS imputed | OLS | Subset of states | 2011–2013 | BRFSS imputed | OLS |
| By age | Subset of states | 2011–2013 | BRFSS imputed | OLS | Subset of states | 2011–2013 | BRFSS imputed | OLS | Subset of states | 2011-2013 | BRFSS imputed | OLS |
| By income | Subset of states | 2011–2013 | BRFSS imputed | OLS | Subset of states | 2011–2013 | BRFSS imputed | OLS | Subset of states | 2011–2013 | BRFSS imputed | OLS |
| By parent status | Subset of states | 2011–2013 | BRFSS imputed | OLS | Subset of states | 2011–2013 | BRFSS imputed | OLS | Subset of states | 2011–2013 | BRFSS imputed | OLS |
| By urbanicity | Subset of states | 2011–2013 | BRFSS imputed | OLS | Subset of states | 2011–2013 | BRFSS imputed | OLS | Subset of states | 2011–2013 | BRFSS imputed | OLS |

*Note*: This assumes that the sensitivity testing would be conducted as part of the analyses for all low-income adults and all comparison states, with the findings from that work informing the state group, pre-years, income measures and estimation methods used in the subgroup analyses. For simplicity here, we assume that the sensitivity testing would lead to the subset of states, 2011–2013 pre-period, BRFSS imputed income and OLS estimation being our preferred approach.