DEPARTMENT OF HEALTH & HUMAN SERVICES
Centers for Medicare & Medicaid Services
7500 Security Boulevard, Mail Stop S2-25-26
Baltimore, Maryland 21244-1850

State Demonstrations Group
Evaluation Design Approval Letter

October 7, 2024

Kelly Cunningham
201 South Grand Avenue East, 3rd Floor
Springfield, IL 62763-0001

Dear Director Cunningham:

The Centers for Medicare & Medicaid Services (CMS) completed its review of the Continuity of Care and Administrative Simplification Evaluation Design, which is required by the Special Terms and Conditions (STCs), specifically, STC #31 "Draft Evaluation Design" of Illinois's section 1115 demonstration, "Continuity of Care and Administrative Simplification" (Project No: Project Number 11-W-00341/5), effective through December 31, 2025. CMS has determined that the Evaluation Design, which was submitted on August 23, 2022 and revised on July 15, 2024, meets the requirements set forth in the STCs and our evaluation design guidance, and therefore approves the state's Evaluation Design.

CMS has added the approved Evaluation Design to the demonstration's STCs as Attachment C. A copy of the STCs, which includes the new attachment, is enclosed with this letter. In accordance with 42 CFR 431.424, the approved Evaluation Design may now be posted to the state's Medicaid website within 30 days. CMS will also post the approved Evaluation Design as a standalone document, separate from the STCs, on Medicaid.gov.

Please note that an Interim Evaluation Report, consistent with the approved Evaluation Design, is due to CMS one year prior to the expiration of the demonstration, or at the time of the extension application, if the state chooses to extend the demonstration. Likewise, a Summative Evaluation Report, consistent with this approved design, is due to CMS within 18 months of the end of the demonstration period. In accordance with 42 CFR 431.428 and the STCs, we look forward to receiving updates on evaluation activities in the demonstration monitoring reports.

We appreciate our continued partnership with Illinois on the Continuity of Care and Administrative Simplification section 1115 demonstration. If you have any questions, please contact your CMS demonstration team.

Sincerely,

Danielle Daly -S Digitally signed by Danielle Daly -S
Date: 2024.10.07 09:24:43 -04'00'

Danielle Daly
Director
Division of Demonstration Monitoring and Evaluation

cc: Courtenay Savage, State Monitoring Lead, CMS Medicaid and CHIP Operations Group

Illinois 1115 Continuity of Care & Administrative Simplification Evaluation Plan Revision

Resubmission to the Centers for Medicare & Medicaid Services July 15, 2024

A. General Background Information

Program Description

The objectives of the Illinois Continuity of Care and Administrative Simplification section 1115(a) demonstration (Project Number 11-W-00341/5) are (1) to provide quality health care and improve health outcomes for Medicaid beneficiaries through care coordination and continuity of care initiatives and (2) to address administrative barriers to care access. Approval for the "Illinois Continuity of Care and Administrative Simplification" demonstration is effective January 19, 2021, through December 31, 2025. On April 12, 2021, the Centers for Medicare & Medicaid Services (CMS) approved an amendment for the state to provide state plan benefits to postpartum women. However, the current evaluation plan does not include this initiative because the state has transitioned its implementation from the 1115 waiver authority to the State Plan Amendment authority.

The state has hypothesized that it can meet the objectives by (1) reinstating eligible Medicaid customers into their prior Medicaid managed care organizations (MCOs) when they submit late redetermination paperwork within 90 days of the date of termination and (2) waiving hospital presumptive eligibility (HPE). Under this demonstration, the state will collect data on, test, and evaluate this hypothesis. The CMS has determined that this project is likely to promote Medicaid's objectives. The two elements are described in greater detail below.

Implementing managed care reinstatements when a Medicaid beneficiary submits late redetermination paperwork within 90 days of the date of termination (42 CFR 438.56(g)): This demonstration will assist the State of Illinois in automatically reenrolling beneficiaries into their prior MCO when they submit late redetermination paperwork within 90 days of their Medicaid termination date and are determined to be eligible for medical coverage. Previously, beneficiaries could reenroll into their prior MCO within 60 days of the redetermination period. However, when they submitted the paperwork after 60 days, but still within 90 days of the redetermination period, they were enrolled into Medicaid fee-for-services (FFS) and had to restart the MCO enrollment process. By extending the automatic re-enrollment period to 90 days, the demonstration is expected to promote continuity of Medicaid coverage and care, minimize churn between Medicaid FFS and managed care, and simplify administrative procedures.

Waiving hospital presumptive eligibility (HPE) (1902(a)(47)(B)): As detailed in 42 CFR 435.1110, states are required to implement an HPE program, which permits hospitals to make presumptive eligibility determinations and provide temporary Medicaid coverage to individuals likely to qualify for Medicaid. To continue Medicaid coverage, qualified individuals need to submit a full Medicaid application around the time their temporary coverage is terminated. However, the demonstration enables Illinois to forego implementing an HPE program in an

effort to (1) minimize unnecessary transitions between FFS and managed care and (2) promote full Medicaid enrollment instead of temporary FFS coverage.

Rationale for This Waiver

Importance of continuity of Medicaid: Improving continuity of Medicaid coverage is a cost-effective way to reduce transition in and out of health care coverage, minimize beneficiary burden, increase the security of health insurance coverage for Medicaid recipients, improve the measurement of health care quality, and enhance people's overall health (Gordon et al., 2019). Additionally, continuous Medicaid enrollment reduces the program's administrative costs (Brooks & Gardner, 2021; Wagner & Solomon, 2021). By contrast, when people lose their Medicaid coverage and are required to reenroll, their health care costs are often higher than when they had continuous coverage. These coverage gaps can also result in delayed access to appropriate health care services (Wagner & Solomon, 2021).

Continuity of care and coverage: Transitioning between FFS and Medicaid managed care due to late submission of redetermination paperwork can disrupt communication with care coordinators, confuse beneficiaries and providers about their existing authorizations, disrupt transportation arrangements, and create gaps in claims history for MCOs monitoring their members' care. This churning also restricts the state's ability to assess health outcomes for Medicaid beneficiaries in managed care. Waiving 42 CFR 435.170(b) to allow beneficiaries' reinstatement into their prior Medicaid MCO within 90 days of receipt of late redetermination paperwork will improve access to high-quality, person-centered services that promote positive health outcomes for individuals and efficiently enhance the longevity of Medicaid benefits.

With the hospital presumptive eligibility (HPE) program, the state is concerned that both the hospital and the beneficiary might fail to submit the follow-up application after an initial hospital stay has been covered under HPE. Waiving HPE will address this concern by encouraging people to apply for full Medicaid benefits rather than relying on temporary coverage. Additionally, payments for services during an HPE segment occur through Medicaid FFS. A large part of Illinois's efforts to improve continuity of care focused on enrolling clients in an MCO that is responsible for working with providers and coordinating the client's health care. Therefore, by waiving HPE, the state expects to minimize churn between FFS and managed care, as well as promote continuity of care.

Administrative simplification: This demonstration will eliminate the additional administrative work of reenrolling beneficiaries into FFS and restart the managed care enrollment process due to the late submission of redetermination paperwork. It will also enable Illinois to focus its administrative resources on processing full Medicaid applications instead of matching HPE and full Medicaid applications.

Population

The 90-day managed care reinstatement initiative, which involves automatically reenrolling a beneficiary in their prior MCO when they regain eligibility within 90 days of the redetermination period, has been implemented for all people who are eligible for Medicaid in the State of Illinois.

The HPE initiative has also been waived for all people who are eligible for Medicaid in the State of Illinois. The state will continue to operate Medicaid presumptive eligibility for

children and pregnant women under the state Medicaid plan.

Illinois 1115 Continuity of Care and Administrative Simplification Goals

Goal 1: Promote continuity of coverage and care. The hypothesis suggests that auto-enrolling a beneficiary in their previous plan within 90 days after the redetermination period will increase months of MCO coverage and reduce MCO coverage disruption. It also suggests that waiving HPE will prevent churning between managed care and FFS and will promote full Medicaid applications and subsequent enrollment. Finally, the hypothesis suggests that auto-enrolling a beneficiary in their previous plan within 90 days after the redetermination period and waiving HPE will increase continuity of care.

Goal 2: Improve MCO quality oversight. The hypothesis suggests that improved continuity of coverage will enable complete MCO quality measurement through the Healthcare Effectiveness Data and Information Set (HEDIS) reporting.

Goal 3: Avoid administrative complexities. The hypothesis suggests that auto-enrolling a beneficiary in their previous plan within 90 days after the redetermination period and waiving HPE will reduce the cost, time, and overall administrative burden of the state's Medicaid program.

Goal 4: Provide quality care and improve health outcomes. The hypothesis suggests that auto-enrolling a beneficiary in their previous plan within 90 days of the redetermination period will result in quality care and improved health outcomes.

B. Evaluation Questions and Hypotheses

Driver Diagram

Using the hypotheses and research questions, we created a driver diagram that depicts relationships between the demonstration's aims, the primary drivers that contribute directly to achieving the aims, and secondary drivers, which are components or processes of the primary drivers. Figure 1 includes Goal 1 (*promoting continuity of coverage and care*), Goal 2 (*improving MCO quality oversight*), and Goal 4 (*providing quality care and improving health outcomes*), which is an expected long-term outcome of achieving Goal 1. Figure 2 includes Goal 3 (*avoiding administrative complexities*), led by different drivers from Goal 1 and the other goals.

As depicted in Figure 1, automatically reenrolling beneficiaries into their prior MCO when they submit late redetermination paperwork within 90 days (instead of 60 days, as previously required) will minimize churn between managed care and FFS. This will promote continuity of MCO coverage, a primary driver of Goal 1 (*promoting continuity of coverage and care*). Meanwhile, waiving the requirement to operate an HPE program will promote hospitals' ability to assist with full Medicaid applications. This will increase MCO enrollment and its timeliness and finally lead to coordinated care, another primary driver of Goal 1. Achieving Goal 1 is expected to *improve MCO oversight quality* (Goal 2) by promoting more complete MCO quality measurement through HEDIS reporting. These two goals are important steps toward achieving Goal 4, *providing quality care and improving health outcomes*.

Figure 1. Driver Diagram for Goals 1, 2, and 4

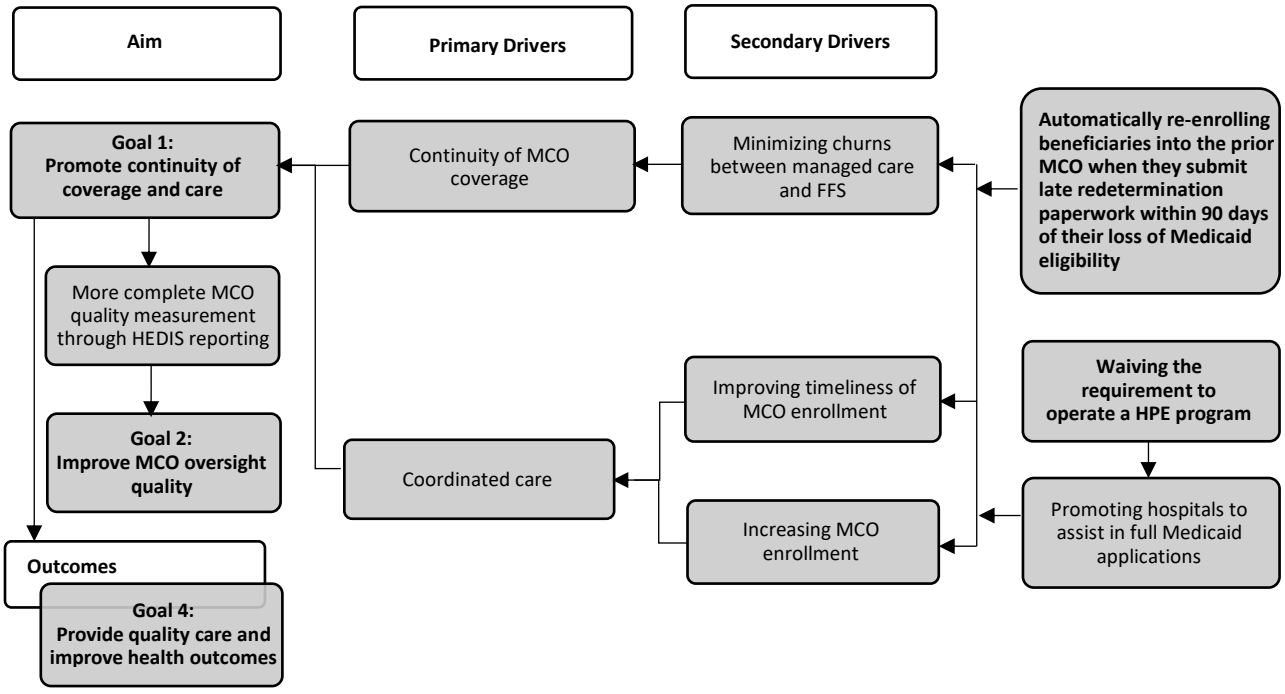


Figure 2. Driver Diagram for Goal 3

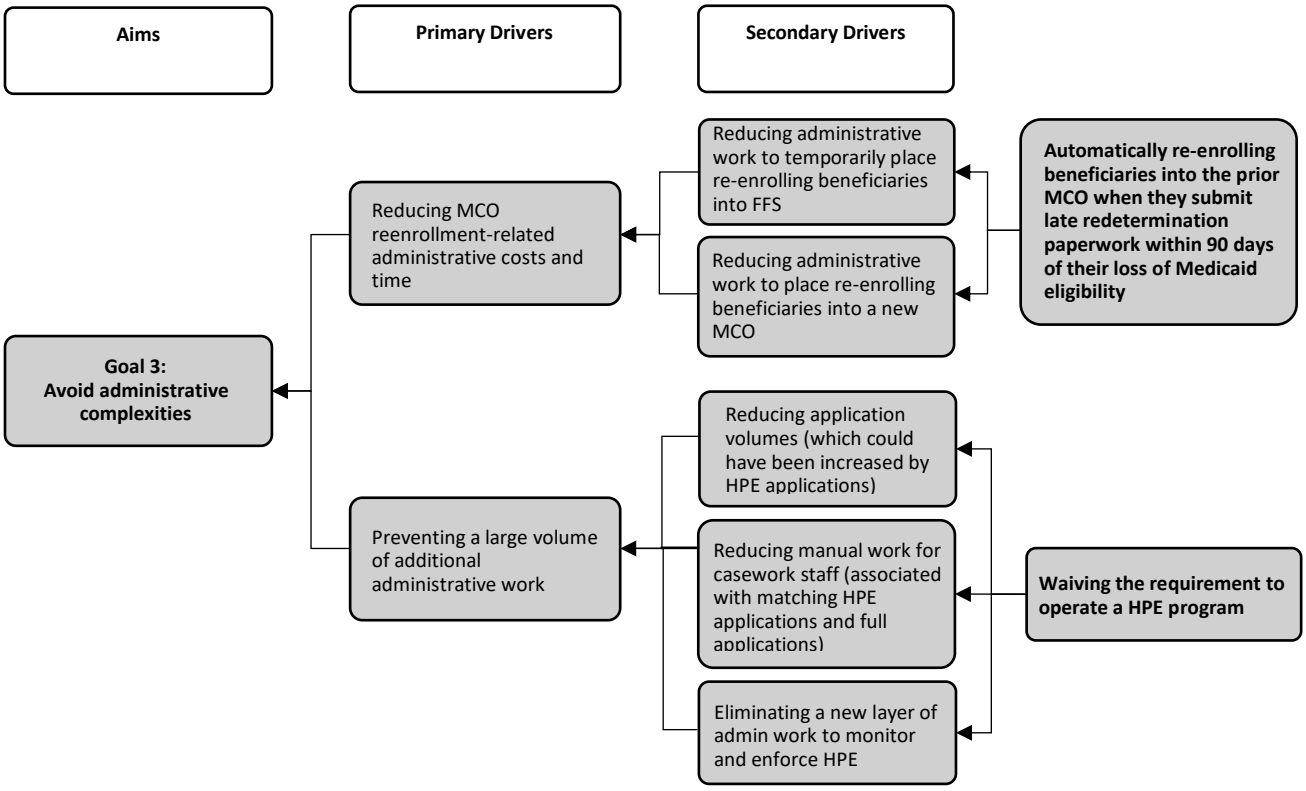


Figure 2 illustrates a driver diagram for reducing administrative complexities in the Illinois Medicaid Plan. Automatically reenrolling beneficiaries into their prior MCO when they submit redetermination paperwork within 90 days after the end of their redetermination period will reduce the administrative burden of temporarily reenrolling beneficiaries into FFS while they go through the MCO enrollment process again. This reduced administrative work will reduce enrollment processing costs and time, which is a primary driver of Goal 3, *avoiding administrative complexities*. Likewise, waiving the requirement of HPE program implementation and its associated HPE applications will (1) decrease the overall number of applications, (2) reduce the workload of staff tasked with matching HPE with full Medicaid applications, and (3) eliminate new and additional administrative work related to oversight and compliance. These secondary drivers related to Goal 3 will eliminate multiple additional administrative complexities and labor.

Illinois 1115 Continuity of Care Waiver Goals, Evaluation Questions, and Hypotheses

The following section describes the translation of the state's demonstration goals into quantifiable targets to measure performance. Specifically, it details the state's hypotheses regarding the demonstration's outcomes as well as the alignment of the evaluation questions, hypotheses, and goals of the demonstration. Finally, this section describes the ways in which the research questions and hypotheses are related to Titles XIX and/or XXI.

Table 1. The Goal, Hypotheses, and Research Questions

Goals	Hypotheses	Research Questions
1. Promote continuity of coverage and care	1.1. The demonstration will reduce the rates of disrupted coverage (gaps in coverage).	1.1.1. Are enrollees less likely to experience a disruption in service by allowing a 90-day reinstatement period into the prior MCO? 1.1.2 Does waiving HPE minimize the churns of Medicaid fee-for-service (FFS) and Medicaid managed care?
	1.2. The demonstration will increase the MCO coverage period.	1.2 Does allowing a 90-day reinstatement period into the prior MCO increase months of MCO coverage?
	1.3. The demonstration will promote full Medicaid applications.	1.3. Does waiving HPE continue to promote hospitals' assistance with full Medicaid benefit applications?

	1.4 The demonstration will increase enrollment in MCO. 1.5 The demonstration will affect the timing of enrollment in MCO. 1.6. The demonstration will improve care coordination. 1.7. The demonstration will increase continuity of care.	1.4. Does the demonstration increase the rate of enrollment in MCO? 1.5 Does waiving HPE encourage timely enrollment in MCO? 1.6. Does the demonstration improve care coordination? 1.7. Does continuity of MCO coverage increase continuity of care?
2. Improve MCO quality oversight	2. The demonstration will improve MCO quality oversight.	2. Does improved continuity of MCO coverage allow for more complete MCO quality measurement through HEDIS reporting?
3. Avoid administrative complexities	3. The demonstration will maintain or reduce administrative costs and time.	3.1. Does allowing beneficiaries to be reenrolled automatically into their previous MCO within 90 days of the reconsideration period reduce administrative costs and time? 3.2. Does waiving HPE prevent increases in application processing costs and time? 3.3. Does waiving HPE prevent increases in Medicaid application backlog?
4. Provide quality care and improve health outcomes	4.1 The demonstration will improve the quality of care. 4.2 The demonstration will improve health outcomes among beneficiaries.	4.1 Does the demonstration improve the quality of care? 4.2 Does the demonstration improve health outcomes among beneficiaries?

C. Methodology

1) Overall Evaluation Design

Following CMS recommendations for waiver demonstrations (Contreary et al., 2018), we will use a rigorous, quasi-experimental pre-post design to compare outcomes before and directly after waiver implementation. Whenever feasible, we will employ the comparative interrupted time series (CITS) as our primary analytic approach, as it is expected to produce robust causal inference. CITS evaluates program/policy impacts by revealing whether the demonstration state deviates from its baseline trend by a greater amount than the comparison state. Because the waiver is open to all Medicaid recipients, a comparison group will be selected from a similar state that does not have the same waiver.

Where CITS is not possible due to the unavailability of a comparison group, we will employ the interrupted time series (ITS) approach to take advantage of available data from multiple time points before and after the intervention. Alternatively, when a comparison group is available but has limited time points, we will use a difference-in-differences (DID) model. In the rare event of extreme scarcity of data or the absence of a suitable control series, a pretest-posttest design will be used to assess the impact of the intervention, and we will note the limitations of this approach. This approach may also be employed when power calculations suggest that the sample size might be insufficient to detect a statistically significant effect. A more detailed rationale for the proposed analytic approach and methodology is provided later in this section.

In interview-based research questions, such as stakeholder interviews, the research team will employ a one-group post-test design. Data will be gathered solely from the demonstration state after the implementation of the waiver. Collected qualitative data will be analyzed using thematic analysis to address these research questions. While this design is straightforward and easier to implement than CITS or DID, the lack of a baseline or pre-waiver measurement will make it impossible to establish a causal relationship or to attribute outcomes to the intervention.

One of the waiver elements, waiving HPE, requires specific evaluation approaches since HPE has never been implemented in Illinois, and thus the waiver does not involve any implementation activities. Stakeholder interview data will be primarily used for evaluation, gauging Medicaid stakeholders' perspectives on the waiver. Supplementing the qualitative findings, relevant pre- and post-waiver quantitative data will be used to identify trends in outcomes when feasible, although significant changes are not anticipated. To analyze these trends, we will employ interrupted time series and pretest-posttest designs, along with descriptive analysis. Detailed measures and methodologies are provided later in this section.

2) Target and Comparison Population

The target population will be limited to Illinois Medicaid-eligible individuals with incomes at or below 138% of the FPL. Specifically, individuals enrolled in Illinois Medicaid from January 19, 2021, to December 31, 2025, will be targeted to test the hypotheses and measure the demonstration's impact. Service providers or other key stakeholders will be interviewed to identify and measure any changes in administrative costs and time followed by the demonstration.

Subgroup Analyses

Where possible and appropriate, the research team may conduct analyses on subgroups within the study population to gauge the impact of the waiver on diverse subgroups across Illinois. Because the evaluation encompasses several policy changes, each potentially affecting various subgroups in different ways, the research team will determine whether specific metrics should be used for subgroup assessments.

As suggested in the subgroup analysis literature (Farrokhyar et al., 2022; Sun et al., 2011), the research team will specify relevant groups within the Illinois Medicaid population and hypothesize regarding the direction of the effect *a priori*. A key aspect of the waiver is that it permits individuals who submit required redetermination paperwork late, but still within a 90-day timeframe, to be automatically reenrolled into their previous MCOs. This provision is expected to benefit individuals who often encounter administrative barriers and risk procedural termination of coverage. In this regard, our evaluation will pay special attention to how the waiver impacts specific racial/ethnic groups as well as the interaction effects of racial/ethnic groups on the main effects of the demonstration. To examine the subgroup effect (i.e., interaction effect), we will use applicable statistical tests and adjusted p-values for multiple testing and sample sizes (Farrokhyar et al., 2022; Sun et al., 2011).

Often, individuals returning paperwork late also have unstable incomes and are subjected to frequent data checks and verifications of ongoing eligibility. Research indicates that people of color experience income instability at higher rates than their White counterparts, and that they consequently face more administrative barriers when accessing public benefits (Carr & Hardy, 2022; Sugar et al., 2021). Additionally, studies show that Medicaid beneficiaries with limited English proficiency encounter significant barriers during the redetermination process, particularly ethnic minorities such as Hispanics and Asians (Arbogast et al., 2022; Mirza et al., 2022). Given the waiver's focus on addressing administrative barriers and its potential to reduce health disparities across race and ethnicity, our evaluation prioritizes examining outcomes among non-White individuals and assessing the waiver's impact on existing disparities. We hypothesize that non-White groups are more likely than Whites to benefit from the extension of the MCO re-enrollment period. However, deficiencies in racial/ethnic data within Medicaid claims may hinder subgroup analyses, necessitating imputation to obtain more meaningful conclusions.

In addition to racial/ethnic subgroups, geographical subgroups will be considered in the evaluation. We will analyze the impact of the waiver on individuals residing in different regions of Illinois, considering variations in healthcare access, socioeconomic factors, and other relevant factors. By examining geographical differences, we aim to identify any disparities in the implementation and outcomes of the waiver across different areas of the state.

Additional subgroups encompass various age groups, which we might obtain by splitting the study population into 10-year age cohorts (e.g., 18-29, 30-39, 40-49) or by separating the population into two broad age categories: working-aged adults (18-64) and older adults (65+). We expect to find impactful differences by age. While older adults are eligible for Medicare, financial difficulties (e.g., trouble affording food, shelter, and other basic needs, can easily lead them to enter Medicaid, too (Willink et al., 2019). Indeed, older adults account for 21% of all Medicaid expenditures, compared to just 10% for adults (Kaiser Family Foundation, 2024). Given the disproportionate impact of this group on healthcare expenditures, a separate evaluation is appropriate whenever possible.

Moreover, the research team may analyze the waiver's effects by gender to provide more comprehensive insights into possible gender gaps in Medicaid utilization and efficacy. Focusing on gender differences in the waiver's impact could illuminate ways in which the waiver contributes to reducing health disparities.

Comparison Group

Depending on the research questions and available data, the comparison group for the evaluation will be either (1) pre-implementation within-state Medicaid members or (2) other state Medicaid populations, particularly in states that do not have a similar demonstration to Illinois, but which have similar demographic characteristics.

The pre-implementation population consists of individuals enrolled in Illinois Medicaid during the period spanning January 2018 to March 2021. Thus, we examine both pre-pandemic and pandemic periods before implementation. Moreover, this group will include clients who are disenrolled from and reenrolled into MCOs before the policy change, accounting for those who switched to a different MCO after their Medicaid FFS reinstatement.

Comparison states were selected from among states in which beneficiaries are not allowed to reenroll in their prior MCO when they submit their redetermination paperwork later than 60 days and within 90 days of eligibility termination. For our evaluation of waiving HPE, other states that have implemented an HPE program constitute a comparison group, allowing us to explore possible challenges and opportunities that could have been applicable to Illinois prior to the waiver demonstration.

Comparison State Selection Methodology

We explored the synthetic control method to select a comparison state, an approach that also suggested by CMS, but it would require sampling many states. Due to the expense of purchasing comparison state data from CMS's vendor of Medicaid and Medicare data (~$18,000 per state per data year; see section F. Evaluation Budget for details), the research team decided to choose just one or two states with which Illinois can be compared. Furthermore, because purchasing comparison state data requires a minimum necessary limit to protect the privacy of subjects, the team concluded that purchasing the fewest states needed for effective comparison would be in the best interest of subject privacy.

Comparison state selection was conducted through a mixed methods approach designed to identify states with high-quality data that were similar to Illinois in the policy environment, Medicaid population, and economic and demographic makeup, yet which had no policy akin to Illinois's 1115 policy changes. Because selecting a state that is perfectly identical to Illinois is not possible, we used a sequence of variables (detailed in Table 2) to identify a comparison state. Using the values of each variable multiplied by a consensus-derived weight, we calculated the Manhattan distance between each state. Because population differences between states were vast, only proportional data or policy data independent of population was used. For MCO spending, the only publicly available data were from the 2022 fiscal year. For all other Medicaid indicators and for monthly unemployment, 2019 data were used to avoid undue influence from the COVID-19 pandemic on the pre-intervention environment of each state. However, for statewide metrics

independent of the Medicaid population, data from the 2017-2021 American Community Survey were used to ensure greater accuracy.

Variables were selected for three broad categories: policy environment, Medicaid spending and population data, and state demographic data. Policy environment variables were selected from policy reports generated by the Kaiser Family Foundation (KFF); these variables (e.g., policies) were included to ensure that even though states differed regarding the 1115 policies, other policy changes pertinent to state Medicaid administration would not confound the comparison. Some policy environment variables were chosen as a proxy measure for the administrative infrastructure of the potential comparison state. For example, the processing of *ex-parte* renewals, the volume of renewals processed *ex-parte*, and the method of *ex-parte* renewal processing (i.e., automated or manual) helped inform the status of Medicaid renewal processing for each state in general. Other variables were chosen to control for the potential impact of policies that may affect the evaluation of eligibility and enrollment, such as CHIP/Medicaid HPE, ACA expansion status, and the 12-month postpartum Medicaid Coverage Extension implementation.

Medicaid spending and population data were also derived from KFF to ensure (1) that the populations enrolled in Medicaid were comparable and (2) that the state had a similar per-beneficiary spending amount as Illinois. To this end, the age distribution of the Medicaid population, the proportion of the Medicaid population enrolled in CHIP, and the makeup of Social Security Insurance beneficiaries within the state were selected as variables to assess a state's comparability to Illinois. Spending was assessed in terms of dollars spent per enrollee. The proportion of MCO spending was also included to examine the extent to which a state relies on MCOs to deliver Medicaid Services. Finally, the federal percentage of Medicaid spending and federal medical assistance percentage (FMAP) multiplier were also evaluated to provide insight into the impact of federal funding on state policy and health outcomes.

Demographic and economic data were also used to assess potential comparison states. To control for health inequities that may arise from educational and racial health disparities at the population level, the racial profile and the level of educational attainment of each comparison state were included. Economic data were used to eliminate confounding by macroeconomic conditions in potential comparison states (e.g., high unemployment rates increasing the Medicaid population by including workers who would not otherwise be enrolled in Medicaid). To this end, two economic indicators were included: (1) the percentage of the state population in the civilian labor force reported by the U.S. Census and (2) the unemployment rate in June 2023. Together, these two indicators offer a yearly and monthly picture of the economic conditions in each state. These data were complemented by U.S. Census data on states' median household income and the percentage of persons in poverty to illuminate further how economic conditions may shape each state's Medicaid landscape. Finally, a healthcare access variable (i.e., the proportion of the population living in a Health Provider Shortage Area) was added to the model to control for the effect of healthcare access on the overall health outcomes within each state.

The research team then weighted the variables based on their potential importance to the overall evaluation. Weighting allowed the team to control for some identified confounders (e.g.,

median household income may reflect cost of living rather than economic conditions) and to prioritize some variables in the model (e.g., it is reasonable to assume that ACA expansion status will have a greater effect than the Medicaid/CHIP pregnancy income limit). The weight of each variable was generated by consensus of the research team, with a simple score (from 1 = low importance to 4 = extremely high importance) assigned to each variable. The mean of the scores assigned by the panel (n = 7) was used to weight the model. Scores were submitted anonymously to avoid bias.

Data quality was assessed via the score assigned by the Data Quality Atlas, and these scores, along with the results of the Manhattan distance model, informed the selection of the comparison state. Because data quality was independent of the other variables, the research team evaluated data quality subjectively, as there were some concerns regarding data quality for most states. A potential comparison state's data quality thus had to be considered against the results of the Manhattan distance model, alongside external factors such as the research team's familiarity with the data and policy environment of the prospective states. After compiling, directly comparing, and discussing data for 12 potential comparison states, 9 of them were rejected due to either data quality (Table 4) or the incompatibility of policy environments with Illinois' for the purposes of the evaluation (e.g., several states that did not adopt the ACA expansion were eliminated, although one, Wisconsin, was retained by the final model). In addition to these 12 states, the research team discussed several other states for possible inclusion. New York and California were strongly considered due to the similarity of population distributions to that of Illinois (i.e., with dense urban areas contrasted with relatively sparse rural areas), but these two states were ultimately discarded due to fundamental differences between the policy environment and the public health environment of these states and Illinois. As a result of the research team's discussions, the comparison of data quality, and the initial explorations of the data, the research team ultimately concluded that the best possible comparison state would be a midwestern state like Illinois, to be chosen based on the results of the Manhattan distance model.

Weighted Manhattan Distance Computation: For an n-dimensional space, the formula for computing the weighted Manhattan distance between two points P = (p_1, p_2, …, p_n) and Q = (q_1, q_2, …, q_n) can be generalized as follows:

$$D = \sum_{i=1}^{n} w_i \,.|p_i - q_i|$$

Where

- $|p_i - q_i|$ is the absolute difference between the i^{th} coordinates of the two points.
- w_i is the weight assigned to the distance in the i^{th} dimension.

In this formula, D represents the weighted Manhattan distance, and the summation runs over all n dimensions of the points in the space. Each term in the summation is the product of the absolute difference in a single dimension and its corresponding weight. This allows for different dimensions to have different "importance" in the distance calculation.

Analysis Results of Manhattan Distance Comparison: As shown in Figure 3, the analysis of the weighted Manhattan distance scores indicates a variation in distance values across the three states compared to Illinois. Iowa has the lowest distance score (19.62), suggesting it is the most similar to Illinois of the three potential comparison states. Nebraska has the highest distance score (24.37), denoting the highest dissimilarity. Wisconsin's score (20.53) falls between the scores of the other two states, suggesting moderate similarity to Illinois.

The differences in distance scores among the states can be attributed to the varying weights assigned to the compared dimensions, which represent factors we considered (e.g., economic indicators, demographic profiles, and policy outcomes). Iowa's proximity in score to Illinois suggests that, with respect to the weighted factors, it is more closely aligned with Illinois than the other states. Nebraska's higher score may reflect more significant differences in critical factors. Wisconsin's score suggests that while there are differences from Illinois, they are not as pronounced as those between Illinois and Nebraska and are minimally different from those between Illinois and Iowa. Iowa data are highly available and the research team is familiar with Wisconsin data. Therefore, the research team opted to select the data from both Wisconsin and Iowa. By selecting two states, the team will be able to increase statistical power via additional control series. Also, including two states will allow the team to address any underlying data errors due to the availability of a reserve control series when necessary.

Figure 3. Weighted Manhattan Distance Scores from Illinois to Other States

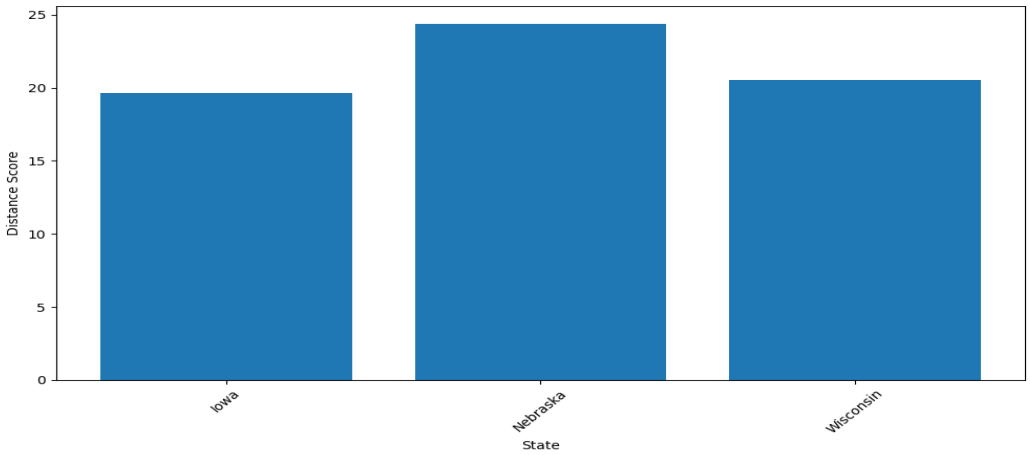


Table 2. Variables Used to Compare States

Variable	Consensus Weights	Reason for inclusion
Policy Environment		
ACA expansion status	4	Enrollment policy impact
Medicaid/CHIP income limit for pregnancy, January 2020	2.16	Affects enrolled population; enrollment policy impact
Presumptive eligibility for CHIP	2.33	May affect PE analysis; policy environment measure
Does state conduct e*x-parte* renewals?	3.5	Administrative comparison
Volume of renewals completed *ex-parte*	3	Administrative comparison
Ex-parte renewal method, mostly automated?	2.83	Administrative comparison
Does state conduct real-time eligibility determinations?	3.17	Administrative comparison
Volume of eligibility determinations completed in real-time	2.83	Administrative comparison
Eligibility determination method	3	Administrative comparison
Medicaid Spending and Enrollment Data		
Spending		
Federal percentage of Medicaid spending, FY 2019	2.83	Affects cost analysis; policy environment
FMAP percentage, FY 2019	2.67	Affects cost analysis; policy environment
Medicaid spending per enrollee, 2019	2.5	Affects cost analysis; may affect health outcomes
MCO spending as a percentage of total Medicaid spending, FY 2022	2.5	May affect MCO re-enrollment analysis; level and quality of care
Enrollment		
Enrollment by age as a percentage, 2019	2.67	Control for Medicaid population differences
CHIP as a percentage of Medicaid enrollment, June 2019	2.33	Control for Medicaid population differences
SSI beneficiaries, percentage distribution, 2019	2.33	Control for Medicaid population differences
State Economic and Demographic Indicators		
Race/ethnicity, 2020 U.S. Census	3	Control for potential health inequities
High school graduate or higher, percentage of persons aged 25+ years, 2017-2021	2.5	Control for potential health inequities
Bachelor's degree or higher, percentage of persons aged 25+ years, 2017-2021	2.5	Control for potential health inequities
Median household income, 2017-2021	2.67	May affect beneficiary population

Persons in poverty percentage, 2017-2021	3.17	May affect beneficiary population
Unemployment rate, June 2019	2.67	May affect beneficiary population
In civilian labor force, percentage of persons aged 16+ years, 2017-2021	2.5	May affect beneficiary population
Persons without health insurance, under age 65	3.33	Healthcare Access; quality of care
Healthcare Access		
Percentage of state population living in HPSA	2.67	Healthcare Access; quality of care

Table 3. Values of nominee states compared to Illinois

Variable	**Value for IL**	**Value for WI**	**Value for IA**	**Value for NE**
ACA expansion status*	Yes	No	Yes	Yes
Medicaid/CHIP income limit for pregnancy, January 2020*	213%	306%	318%	202%
Presumptive eligibility for CHIP*	Yes	Limited Coverage Proposed	No	No
Does state conduct e*x-parte* renewals?*	Yes	Yes	Yes	Yes
Volume of renewals completed *ex-parte,* >50%*	Yes	No	Yes	NA
Ex-parte renewal method, mostly automated*	No	Yes	Yes	NA
Does state conduct real-time eligibility determinations?*	Yes	Yes	Yes	Yes
Volume of eligibility determinations completed in real time, >50%*	NA	No	No	No
Eligibility determination method, mostly automated*	NA	Yes	Yes	No
Federal percentage of Medicaid spending, FY 2019*	66.34%	65.0%	72.9%	66.3%
FMAP percentage, FY 2019*	50.31%	59.4%	59.9%	52.6%
Medicaid spending per enrollee, 2019, all enrollees*	$5,491	$7,362	$6,658	$7,172
Medicaid spending per enrollee, 2019, seniors*	$13,191	$9,538	$16,646	$19,090
Medicaid spending per enrollee, 2019, individuals with disabilities*	$12,618	$21,256	$20,920	$16,111

Medicaid spending per enrollee, 2019, adults*	$2,989	$5,641	$5,626	$6,043
Medicaid spending per enrollee, 2019, children*	$2,265	$3,201	$2,486	$2,108
Medicaid spending per enrollee, 2019, newly eligible adults*	$6,113	NA	$5,014	NA
MCO spending as a percentage of total Medicaid spending, FY 2022*	74.2%	30.6%	88.8%	57.7%
Enrollment by age, as a percentage 2019, 0-18*	40.1%	39.6%	41.4%	59.7%
Enrollment by age, as a percentage 2019, 19-26*	11.4%	10.8%	12.6%	7.3%
Enrollment by age, as a percentage 2019, 27-44*	21.5%	18.2%	22.9%	14.0%
Enrollment by age, as a percentage 2019, 45-64*	17.6%	16.0%	16.6%	9.7%
Enrollment by age, as a percentage 2019, 65+*	9.3%	11.3%	6.5%	9.3%
CHIP as a percentage of Medicaid enrollment, June 2019*	41%	48.8%	50.1%	66.5%
SSI beneficiaries, percentage distribution, 2019*	2.1%	2.0%	1.6%	1.5%
Race/ethnicity, 2020 U.S. Census, White†	76.1%	86.6%	89.8%	87.5%
Race/ethnicity, 2020 U.S. Census, Black or African American†	14.7%	6.6%	4.4%	5.4%
Race/ethnicity, 2020 U.S. Census, American Indian and Alaska Native†	.06%	1.2%	.6%	1.6%
Race/ethnicity, 2020 U.S. Census, Asian†	6.3%	3.2%	2.8%	2.8%
Race/ethnicity, 2020 U.S. Census, Native Hawaiian and Other Pacific Islander†	.01%	0.1%	.2%	0.1%
Race/ethnicity, 2020 U.S. Census, two or more races†	2.2%	2.2%	2.2%	2.5%
Race/ethnicity, 2020 U.S. Census, Hispanic or Latino†	18.3%	7.6%	6.9%	12.3%
High school graduate or higher, percentage of persons aged 25+ years, 2017-2021†	89.9%	92.9%	92.8%	91.7%

Bachelor's degree or higher, percentage of persons aged 25+ years, 2017-2021†	36.2%	31.5%	29.7%	32.9%
Median household income, 2017-2021†	$72,563	$67,080	$65,429	$66,644
Persons in poverty, percentage, 2017-2021†	11.9%	10.7%	11.0%	11.2%
Unemployment rate, June 2019‡	3.6%	2.5%	2.7%	1.9%
In civilian labor force, percentage of persons aged 16+ years, 2017-2021 †	65.1%	66.0%	65.1%	68.9%
Persons without health insurance, under age 65†	7.7%	6.3%	5.4%	7.8%
Percentage of state population living in HPSA*	28.6%	27.6%	26.9%	7.42%
*Kaiser Family Foundation, State Health Facts †U.S. Census Bureau, 2017-2021 data is derived from the American Community Survey, 2020 data is derived from the 2020 census ‡Bureau of Labor Statistics				

Table 4. Selected Data Quality Scores for candidate comparison states' T-MSIS Analytic Files

Topic	*Enrollment Spans*	*Age*	*Race/ Ethnicity*	*Gender*	*Income*	*IP* Claim Volume*	*OT* Claim Volume*	*Rx* Claim Volume*	*Total Medicaid Expenses*
Iowa	LC	LC	NA	LC	HC	LC	LC	LC	LC
Idaho	LC	LC	NA	LC	HC	LC	LC	LC	LC
Nevada	LC	LC	NA	LC	LC	LC	MC	LC	LC
Montana	MC	LC	NA	LC	LC	LC	LC	LC	MC
Nebraska	MC	LC	NA	LC	HC	MC	LC	LC	LC
New Hampshire	MC	LC	NA	LC	LC	LC	LC	LC	MC
Arkansas	LC	LC	NA	LC	LC	LC	LC	MC	HC
Wisconsin	MC	LC	NA	LC	U	LC	MC	LC	LC
Missouri	MC	LC	NA	LC	U	MC	LC	LC	MC
South Carolina	U	LC	NA	LC	LC	LC	LC	MC	LC
Florida	U	LC	NA	LC	LC	LC	MC	LC	LC
Texas	MC	LC	NA	LC	MC	LC	LC	MC	MC
LC – Low Concerns (about data integrity), MC – Medium Concern, HC – High Concern, U – Unusable									
*IP – Inpatient, OT – Outpatient, Rx – Pharmacy									
Source: Medicaid Data Quality (DQ) Atlas, 2022 preliminary data									

3) Evaluation Period

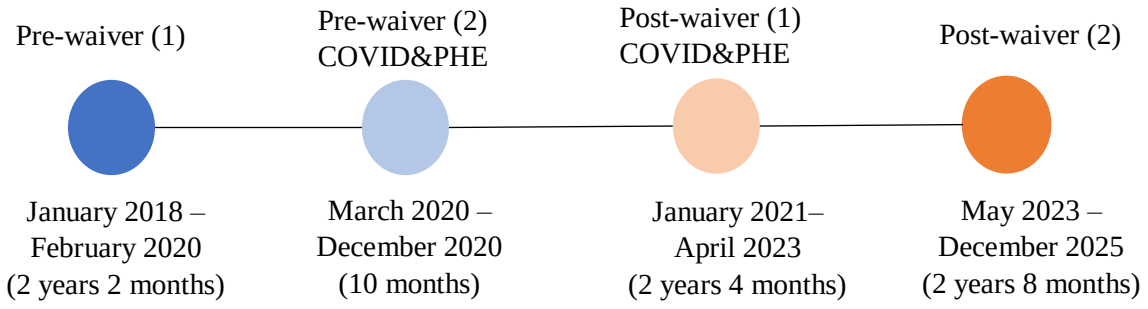
The evaluation period for this analysis spans two distinct phases: the pre-waiver period and the post-waiver period. The pre-waiver period runs from January 2018 to December 2020. This period includes data prior to the COVID-19 pandemic, providing a true baseline for comparison. It also encompasses the onset of COVID-19 and subsequent declaration of public health emergency (PHE), which allows us to observe any immediate impacts of the pandemic on the variables of interest. The post-waiver period extends from January 2021 to December 2025. This period includes the waiver change implementation in January 2021. It overlaps with the PHE continuous enrollment provision, which continued until April 2023. This overlap is crucial for understanding how the waiver change interacts with the PHE provisions. After April 2023, the data reflects a period without the PHE continuous enrollment provision, offering insights into the long-term effects of the waiver change without the confounding influence of the PHE.

Figure 4.1 provides visual representations of the evaluation period for the primary analysis. This analysis aims to measure the overall impact of the waiver change by comparing the pre-waiver and post-waiver periods. This approach provides a comprehensive view of the waiver's effects while accounting for the immediate context of COVID-19 and the PHE.

Figure 4.1. Evaluation Period for the Primary Analysis

Figure 4.2 illustrates the evaluation period for the secondary analysis. To isolate the impacts of additional influencing factors such as COVID-19 and the PHE continuous enrollment provision, a secondary analysis will be conducted. This secondary analysis will separate the pre-waiver and post-waiver periods into more granular phases, enabling a more detailed examination of how these factors may have affected the outcomes independently of the waiver change. Detailed methodological approaches to isolate the interim effects in the secondary analysis are outlined in Section D, Methodological Limitations.

Figure 4.2. Evaluation Period for the Secondary Analysis



4) Evaluation Measures and Analytic Methods

Table 5.1. Summary of Measures and Analytic Approach for Goal 1				
Demonstration Goal 1: Promote continuity of coverage and care **Hypothesis 1.1:** The demonstration will reduce MCO coverage disruption.				
Research question	Proposed outcomes or indicators	Sample or population subgroups to be compared	Potential data sources	Draft analytical approach
1.1.1 Are enrollees less likely to experience an MCO coverage disruption if a 90-day reinstatement period into the prior MCO is allowed?	• The number of MCO enrollees who had experienced an MCO coverage gap divided by the total number of Medicaid enrollees (quarterly and annually, as feasible, during the pre- vs. post-waiver period). • Length of MCO enrollment gaps (in a year). • The number of enrollees who fail to recertify but subsequently reenroll in the same health plan (in a year).	Medicaid enrollees Subgroups: • Racial/ethnic groups (e.g., White, Black, Hispanic, others) • Age groups (e.g., children, young adults, adults, seniors) • Geographical groups (e.g., urban, suburban, rural) • By gender	Medicaid enrollment data	• Comparative interrupted time series (CITS) • Difference-in-differences (DID) • Pretest-posttest design • Propensity score matching (PSM) for matching demonstration and comparison group
1.1.2 Does waiving HPE minimize the churns of Medicaid FFS and Medicaid managed care?	• The number of MCO enrollees transitioned from FFS within 12 months, divided by the total number of Medicaid enrollees (pre- vs. post-waiver period)	Medicaid enrollees	Medicaid enrollment data	• ITS • Pretest-posttest design • Descriptive analysis

	• Churns between managed care and FFS (pre- vs. post-waiver period)	Medicaid enrollees	Stakeholder interview	• Thematic analysis
Hypothesis 1.2: The demonstration will increase the MCO coverage period.				
1.2. Does allowing a 90-day reinstatement period into the prior MCO increase months of MCO coverage?	• The total number of months of Medicaid coverage period covered by MCO (in one and two years[s]).	Medicaid enrollees Subgroups: • Racial/ethnic groups (e.g., White, Black, Hispanic, others) • Age groups (e.g., children, young adults, adults, seniors) • Geographical groups (e.g., urban, suburban, rural) • By gender	Medicaid enrollment data	• CITS • DID • Pretest-posttest design • PSM for matching demonstration and comparison group
Hypothesis 1.3: The demonstration will promote full Medicaid applications.				
1.3. Does waiving HPE continue to promote hospitals' assistance with full Medicaid benefit applications?	• Hospitals' assistance with full Medicaid applications (pre- vs. post-waiver period).	Medicaid enrollees	Stakeholder interview	• Thematic analysis

Hypothesis 1.4: The demonstration will increase the enrollment in MCO.				
1.4. Does the demonstration increase the rate of enrollment in MCO?	• Total number of Medicaid MCO enrollees divided by total number of Medicaid enrollees (quarterly and annually, as feasible, during the pre- vs. post-waiver period)	Medicaid enrollees Subgroups: • Racial/ethnic groups (e.g., White, Black, Hispanic, others) • Age groups (e.g., children, young adults, adults, seniors) • Geographical groups (e.g., urban, suburban, rural) • By gender	Medicaid enrollment data	• CITS • DID • Pretest-posttest design • PSM for matching demonstration and comparison group
Hypothesis 1.5: The demonstration will affect the timing of enrollment in MCO.				
1.5. Does waiving HPE encourage timely enrollment in MCO?	• Application processing backlog and turnaround time • Reduced duplicative processes	Medicaid enrollees	Stakeholder interview	• Thematic analysis
	• Time to become enrolled in Medicaid from the date of first visit to a hospital	Medicaid enrollees	Medicaid enrollment and claims data; Stakeholder interview	• ITS • Pretest-posttest design • Descriptive analysis • Thematic analysis
Hypothesis 1.6: The demonstration will improve care coordination.				
1.6. Does the demonstration improve care coordination?	• Emergency Transfer Communication: Percentage of patients transferred to another health care facility whose medical record documentation indicated that the required information was communicated to the receiving	Medicaid enrollees Subgroups: • Racial/ethnic groups (e.g., White,	Medicaid claims data	• CITS • DID • Pretest-posttest design

	facility prior to departure (subsection 1) or within 30 minutes of transfer (subsections 2-7) (CBE ID: 0291; CMIT #1120). • Medication Reconciliation Post-Discharge: The percentage of discharges for patients at least 18 years of age in which the discharge medication list was reconciled with the current medication list in the outpatient medical record by a prescribing practitioner, clinical pharmacist, or registered nurse (CBE ID: 0097, CMIT #441). • Correlation with Existing Imaging Studies for All Patients Undergoing Bone Scintigraphy: Percentage of final reports for all patients, regardless of age, undergoing bone scintigraphy that includes physician documentation of correlation with existing relevant imaging studies (e.g., x-ray, MRI, CT) that were performed (CBE ID: 0511, CMIT #470). • Medication Information: Percentage of patients transferred to another health care facility whose medical record documentation indicated that medication information was communicated to the receiving facility within 60 minutes of departure (CBE ID: 0293; CMIT #1404). • Nursing Information: Percentage of patients transferred to another health care facility whose	Black, Hispanic, others) • Age groups (e.g., children, young adults, adults, seniors) • Geographical groups (e.g., urban, suburban, rural) • By gender		• PSM for matching demonstration and comparison group

	medical record documentation indicated that nursing information was communicated to the receiving facility within 60 minutes of departure (CBE ID: 0296; CMIT #1402). • Patient Information: Percentage of patients transferred to another health care facility whose medical record documentation indicated that patient information was communicated to the receiving facility within 60 minutes of departure (CBE ID: 0294; CMIT #1399). • Physician Information: Percentage of patients transferred to another health care facility whose medical record documentation indicated that physician information was communicated to the receiving facility within 60 minutes of departure (CBE ID: 0295; CMIT #1400). • Procedures and Tests: Patients who are transferred from an emergency department (ED) to another healthcare facility whose medical record documentation indicated that a list of tests performed and their results was communicated to the receiving facility within 60 minutes of discharge (CBE ID: 0297; CMIT #1401). • Vital Signs: Percentage of patients transferred to another health care facility whose medical record documentation indicated that the entire vital signs record was communicated to the			

	receiving facility within 60 minutes of departure (CBE ID: 0292; CMIT #1403). (Measurement on a quarterly or annual basis, as feasible.)			
Hypothesis 1.7: The demonstration will increase continuity of care.				
1.7 Does continuity of MCO coverage increase continuity of care?	• Primary care continuity: average number of primary care visits per year. • Bice-Boxerman Continuity of Care (COC): Patient-level care continuity that ranges from 0 to 1; 0 reflects completely disjointed care (a different provider for each visit), and 1 reflects complete continuity with the same provider for all visits. $$COC = \frac{\sum_{j=1}^{s} n_j^2 - n}{n(n-1)}$$ n = total number of outpatient visits n_j = number of visits to provider j s = number of providers • Herfindahl-Hirschman Index (HHI): to measure market concentration using the sum of the squares of discharges from a disease category, viewed as a proportion of all discharges from the hospital. $$HHI = \sum_{i=1} (P_i^2)$$	Medicaid enrollees Subgroups: • Racial/ethnic groups (e.g., White, Black, Hispanic, others) • Age groups (e.g., children, young adults, adults, seniors) • Geographical groups (e.g., urban, suburban, rural) • By gender	Medicaid claims data	• CITS • DID • Pretest-posttest design • PSM for matching demonstration and comparison group

	P_i = proportion of the number of each hospital visits accounted for by the *i* th hospital. • Usual Provider of Care (UPC): The number of visits to the provider or practice group with the highest number of visits divided by the total number of visits. $$UPC = \frac{Max\ (n_1, n_2, \dots, n_M)}{N}$$ N = total number of visits n = number of visits to each provider M = total number of provider • Sequential Continuity Index (SECON): The fraction of sequential visit pairs in which a patient sees the same provider (i.e., sees the same provider at two consecutive visits). $$SECON = \frac{\sum_{j=1}^{n-1} c_j}{n-1}$$ n = total number of visits c_j = indicator of sequential visits to same providers; equal to 1 if visits j and j+1 are to the same provider, 0 otherwise (Measurement on a quarterly or annual basis, as feasible)			

Table 5.2. Summary of Measures and Analytic Approach for Goal 2				
Demonstration Goal 2: Improve MCO quality oversight **Hypothesis 2**: The demonstration will improve MCO quality oversight.				
Research question	Proposed outcome measures or indicators	Sample or population subgroups to be compared	Potential data sources	Draft analytical approach
2. Does improved continuity of MCO coverage allow for more complete MCO quality measurement through HEDIS reporting?	• The rate of MCO enrollees meeting the HEDIS 12-month continuous enrollment standard for each year.	MCO enrollees	Medicaid enrollment data	• CITS • DID • Pretest-posttest design • PSM for matching demonstration and comparison group

Table 5.3. Summary of Measures and Analytic Approach for Goal 3				
Demonstration Goal 3: Avoid administrative complexities **Hypothesis 3:** The demonstration will maintain or reduce administrative costs and time.				
Research question	Proposed outcome measures or indicators	Sample or population subgroups to be compared	Potential data sources	Draft analytical approach
3.1. Does allowing beneficiaries to be reenrolled automatically into their previous MCO within the 90-day reconsideration period reduce administrative costs and time?	• Administrative costs to reenroll beneficiaries who submit late redetermination paperwork within the 90-day reconsideration period divided by the number of Medicaid enrollees (quarterly and annually, as feasible, during the pre- vs. post-intervention period). • Staff time equivalents needed to reenroll beneficiaries who submit late redetermination	Medicaid enrollees; Medicaid agency; MCOs; providers	Illinois state administrative records (if available); stakeholder interview	• ITS • Pretest-posttest design • Thematic analysis

	paperwork within the 90-day reconsideration period divided by the number of Medicaid enrollees			
3.2. Does waiving HPE prevent increases in application processing costs and time?	• Administrative costs to process applications • Staff time (including casework staff) equivalents needed to process applications	Medicaid enrollees; Medicaid agency; providers	Stakeholder interview	• Thematic analysis
3.3. Does waiving HPE prevent increases in Medicaid application backlog?	• Medicaid application backlog: the number of Medicaid applications that have surpassed 45 days for initial applications or 60 days for renewals.[1]	Medicaid enrollees; Medicaid agency	Illinois state administrative records	• ITS • Pretest-posttest design • Descriptive analysis

Table 5.4. Summary of Measures and Analytic Approach for Goal 4				
Demonstration Goal 4: Provide quality care and improve health outcomes **Hypothesis 4.1:** The demonstration will improve the quality of care.				
Research Question	Proposed outcome measures or indicators	Sample or population subgroups to be compared	Potential data sources	Draft analytical approach
4.1. Does the demonstration improve the quality of care?	Quality of Care[2]: • Cervical Cancer Screening (CMIT[3]#118) • Chlamydia Screening in Women Ages 21 to 24 (CMIT#128) • Breast Cancer Screening (CMIT#93) • Prenatal and Postpartum Care (CMIT#581)	Medicaid enrollees Subgroups: • Women • Pregnant women	Medicaid claims data	• CITS • DID • Pretest-posttest design • PSM for matching demonstration

[1] The State of Illinois reports backlogs as delays of 45 days or more for initial applications and 60 days or more for renewals. Retrieved from https://www.dhs.state.il.us/page.aspx?item=117858 or https://hfs.illinois.gov/content/dam/soi/en/web/hfs/sitecollectiondocuments/quarter12024backlogreport.pdf

[2] The measures are referenced from CMS Core Set of Adult Health Care Quality Meausres https://www.medicaid.gov/medicaid/quality-of-care/performance-measurement/adult-and-child-health-care-quality-measures/adult-health-care-quality-measures/index.html

[3] The CMS Measures Inventory Tool (CMIT) is the repository of record for information about the measures that CMS uses to promote health care quality and quality improvement.

	• Controlling High Blood Pressure (CMIT#167) • Hemoglobin A1c Control for Patients with Diabetes (CMIT#148) • HIV Viral Load Suppression (CMIT#325) • Initiation and Engagement of Alcohol and Other Drug Abuse or Dependence Treatment (CMIT#394) • Follow-up After Hospitalization for Mental Illness within 7 days or 30 days - Ages 6-17 (CMIT#268) - Ages 18 and older (CMIT#265) • Use of Pharmacotherapy for Opioid Use Disorder (CMIT#750) • Follow-Up After Emergency Department Visit for Alcohol and Other Drug Abuse or Dependence (CMIT#268) • Immunizations for Adolescents (CMIT#1775)	• Racial/ethnic groups (e.g., White, Black, Hispanic, others) • Age groups (e.g., children, young adults, adults, seniors) • Geographical groups (e.g., urban, suburban, rural)		and comparison group
Hypothesis 4.2: The demonstration will improve health outcomes among beneficiaries.				
4.2. Does the demonstration improve health outcomes among beneficiaries?	• Rate of ED visits (HEDIS Emergency Department Utilization[4]; CMIT #234). • Proportion of high-frequency ED utilizers. (Measurement on a quarterly or annual basis, as it is feasible)	Medicaid enrollees Subgroups: • Racial/ethnic groups (e.g., White, Black, Hispanic, others)	Medicaid claims data	• CITS • DID • Pretest-posttest design • PSM for matching demonstration and

[4] This measure is drawn from the HEDIS established by NCQA. The observed-to-expected ratio is multiplied by the emergency department visit rate across all health plans to produce a risk-standardized rate that allows for national comparison.

		• Age groups (e.g., children, young adults, adults, seniors) • Geographical groups (e.g., urban, suburban, rural) • By gender		comparison group

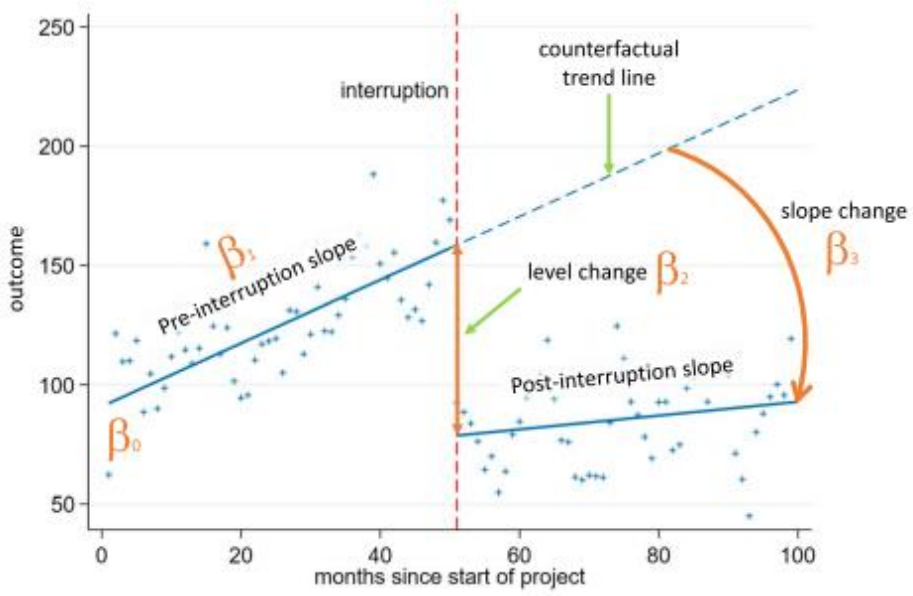
Comparative Interrupted Time Series and Interrupted Time Series

Comparative interrupted times series (CITS) and interrupted time series (ITS) designs are quasi-experimental approaches to evaluate interventions when there are multiple and equally spaced data points before and after the intervention. Wheresa ITS does not require a comparison group, CITS is an extension of ITS through the addition of a comparison group to further minimize the potential for biased results arising from concurrent external events; as such, it will be the primary analytic method for this evaluation.

The main objective of ITS is to examine whether the data pattern observed post-intervention is different from the data pattern observed pre-intervention. Several effect estimates can help describe the impact of waiver administration. For example, a change in level corresponds to the difference in outcomes at the time of administration from the predicted pre-administration trend, and a change in slope corresponds to the difference between the post- and pre-administration slopes. For accuracy, it is necessary to report both level change and change in trend to interpret the results of an ITS study.

We employ ITS with the assumption that the waiver demonstration, and not any other factor, will produce any change that occurs. Thus, the measurements taken before the demonstration's initiation will be used to model a counterfactual scenario in which the intervention did not occur. The regression model is explained in Figure 5.

Figure 5. Interrupted Time Series Approach with No Comparison State/Group: Graphical Depiction of a Segmented Linear Regression Model



Source: Simon L. Turner, 2021

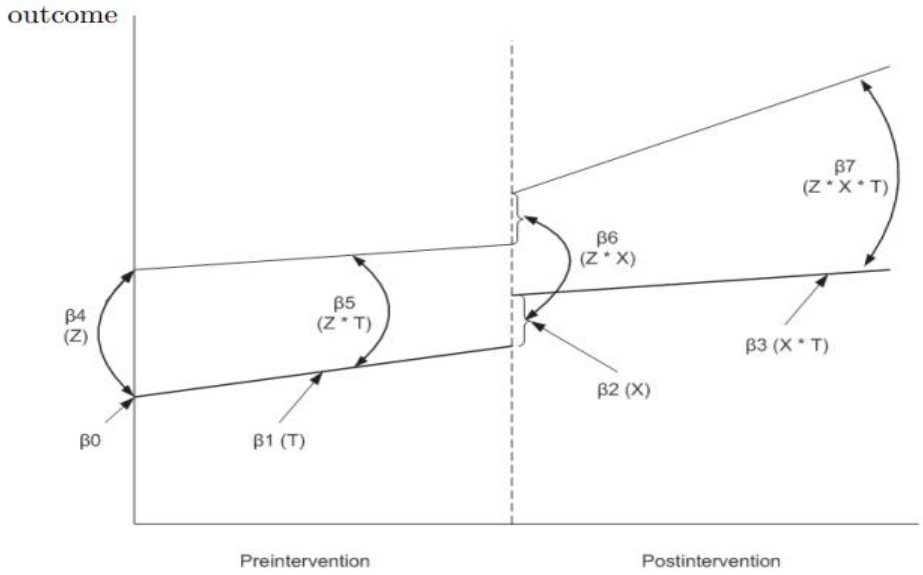
The model using the single group ITS can be presented as follows:

$$Y = \beta_0 + \beta_1 T + \beta_2 X + \beta_3 XT + \varepsilon$$

Where *T* is the time elapsed since the start of the study
X is the study phase (pre-waiver = 0, post-waiver = 1);
Y is the outcome at time T;
XT is the time after interruption/waiver administration;
β_0 represents the intercept at the initial data collection period;
β_1 is the pre-interruption slope until the waiver began on January 2021;
β_2 is the level change following the interruption that measures in the period immediately following the waiver; and
β_3 represents the difference between pre-interruption and post-interruption slopes of the outcome.

Including a comparison group in the CITS design will add another trend line to the figure above, as Figure 6 illustrates. Although CITS design is related to difference-in-differences design in a way that uses a comparison group and observations before and after an intervention, CITS offers the additional benefit of assessing the impact of the intervention, both the changes in outcome level and changes in the long-term trend. To yield this benefit, CITS design requires multiple data points, unlike DID. A detailed description of DID will be provided in the following section.

Figure 6. Interrupted Time Series Approach with A Comparison State/Group



Note. The lower line refers to the visual depiction of a single group, and the upper and lower lines refer to the visual depiction of multiple groups.
Source: Linden & Adams, 2011

The model using CITS can be presented as follows:

$$Y = \beta_0 + \beta_1 T + \beta_2 X + \beta_3 XT + \beta_4 Z + \beta_5 ZT + \beta_6 ZX + \beta_7 ZXT + \varepsilon$$

Where Z is a dummy variable indicating waiver state (1) or comparison state (0);
ZT is time for the waiver state and 0 for the comparison state;
ZX is the study phase for the waiver state and 0 for the comparison state;
ZXT is time after interruption/waiver for the waiver state and 0 for comparison state;
β_4 is the difference in the level between the waiver and comparison state at the beginning of the data collection period;
β_5 is the difference in the slope between the waiver and comparison state prior to the waiver;
β_6 is the difference in the level between waiver and comparison state in the period. Immediately following the waiver; and
β_7 is the difference between waiver and comparison state in the slope after initiation of the administration.

Using ITS and CITS to estimate regression coefficients and examine long-term trends effectively requires a minimum of three to four data points (both before and after an intervention) in the case of yearly data[5] and a minimum of 12 data points (both before and after an intervention) in the case of monthly data.[6] Depending on the granularity of data (i.e., available intervals of measurement), the ITS or DID approach will be applied to our evaluation. Because the COVID-19 PHE occurred during the pre-waiver period and continued into the initial stages of the post-waiver administration, the analysis will be adjusted to account for any COVID and/or PHE impact, as detailed in the limitations section.

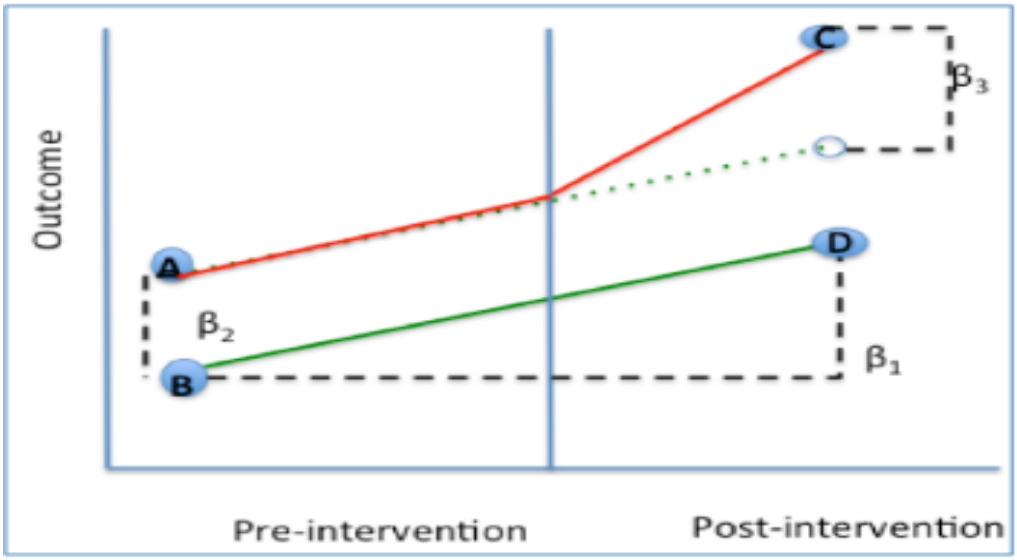
Difference-in-Differences Design

Difference-in-Differences (DID) is a quasi-experimental design, typically used to estimate the effect of a specific intervention, such as the enactment of policy or large-scale program implementation like the section 1115(a) demonstration. DID evaluates the impact of a program/policy by looking at whether the demonstration state deviates from its baseline mean by a greater amount than the comparison state. Consequently, DID requires data from both pre-and post-waiver periods as well as data from both the state where the demonstration is implemented and from another similar state not implementing this or a similar demonstration. We present a graphical explanation of this approach with one pre-intervention and one post-intervention datapoint in Figure 7.

[5] Hategeka, C., Ruton, H., Karamouzian, M., Lynd, L. D., & Law, M. R. (2020). Use of interrupted time series methods in the evaluation of health system quality improvement interventions: A methodological systematic review. *BMJ Global Health*, *5*(10). https://doi.org/10.1136/bmjgh-2020-003567

[6] Wagner, A. K., Soumerai, S. B., Zhang, F., & Ross-Degnan, D. (2002). Segmented regression analysis of interrupted timeseries studies in medication use research. *Journal of Clinical Pharmacy and Therapeutics*, *27*, 299-309. https://doi.org/10.1046/j.1365-2710.2002.00430.x

Figure 7. The Difference-in-Differences Approach



The regression model using DID is:

$$\text{Outcome} = \text{constant} + \text{Time}*\beta_1 + \text{Intervention}*\beta_2 + (\text{Time}*\text{Intervention})*\beta_3 + \text{Covariates}*\beta_4 + \varepsilon$$

Where,

β_0 = Average before section 1115(a) waiver demonstration period
β_1 = Time trend in the comparison group (other state) = (D-B)
β_2 = Difference between two groups before the waiver demonstration = (A-B)
β_3 = Difference in changes over time = (C-A) – (D-B)

The idea behind the DID identification strategy is simple. The two groups could exhibit observable differences, meaning their group-specific means might differ even in the absence of any waiver administration. However, if this difference remains constant over time (i.e., the parallel trend assumption), regardless of the waiver, it can be eliminated by deducting the group-specific means of the outcome of interest. The remaining difference between these group-specific changes must then reflect the causal effect of interest. If available, multiple pre-waiver time points from Illinois and the comparison state will be used to satisfy the parallel trend assumption, making the DID analysis more robust.

Pretest-posttest Design

Where data quality is highly suspect or the quantity of data is insufficient for the construction of a time series, we will resort to a pretest-posttest design to allow for some evaluation of the impact of the waiver. Pretest-posttest designs can be used in both experimental and quasi-experimental research and may or may not include a comparison group. They involve analyzing the differences in the outcome before and after the waiver demonstration to see if the waiver has a significant effect on the outcome. The research team will run a one-way, two-sample t-test between the pre-waiver and the post-waiver datapoints and determine if there is any significant change and the effect size of the change. Because this design offers no way to account

for time, the research team only intends to use it for exploratory analyses or in instances where data availability is limited.

Although a pretest–posttest design effectively manages individual differences and reflects contextual factors through baseline/pretest measures, the absence of a comparison group poses challenges in attributing observed changes to the waiver administration. External factors or maturation may contribute to the outcomes, complicating the interpretation of causality. To minimize these limitations, the research team will bolster its strength by including covariates on which to match beneficiaries. This will reduce the chances of confounding by another factor. The team will also control for covariates using propensity score matching to generate an ideally matched subset of the population.

One-Group Posttest Design

In a one-group posttest design, data are collected only after the administration of a waiver. The research team will use this design only when it is difficult to obtain pre-waiver measurements or when the primary focus of the analysis is to understand the immediate effects of administration. Because this design is vulnerable to validity threats, it will be used only in cases where pre-demonstration and comparison group data are unavailable. Measures will include stakeholder interviews designed to gauge perceptions about the effects of the waiver demonstration. The absence of baseline/pretest data in this design makes it more challenging to identify alternative explanations for observed changes, such as external factors, maturation effects, and selection bias. These limitations will be carefully considered as the research team develops interview questions and subsequent analytic approaches. The comprehensive contexts surrounding the waiver change will be considered when collecting and describing the experiences of stakeholders, as well as when explaining the impact of the demonstration. The research team will develop a detailed qualitative analytic approach in conjunction with a data collection plan.

Propensity Score Matching

When it is possible to directly compare the health outcomes of beneficiaries, we will use propensity score matching to match beneficiaries from Illinois to a pool of comparable beneficiaries in either of the two comparison states. Because we will match at the level of individual beneficiaries, not states, we can match beneficiaries from Illinois to those from either Wisconsin or Iowa. This will both expand the overall pool of beneficiaries to match with and control for discrepancies between the comparison states and Illinois. For example, any differences that may arise from the preexisting differences between Illinois and Wisconsin can be controlled for via the addition of matched Iowan beneficiaries.

Propensity score matching for claims data will involve creating a subset of beneficiaries by selecting first an exposed beneficiary (i.e., an Illinois Medicaid beneficiary) and matching with an unexposed beneficiary (from Wisconsin or Iowa) with identical or similar levels of a list of covariates, to be selected at the time of analysis (Seeger et al., 2005). The subset will, therefore, control for the selected covariates, and one of the above analytic methods (ITS, DID, or pre/post-testing) will be applied to the subset to assess the impact of this demonstration.

The evaluation plan will include a comprehensive sensitivity analysis to examine the stability of our findings under various scenarios and ensure methodological robustness. We will

explore the effects of modifying the selection of covariates, utilizing alternative matching algorithms (e.g., nearest neighbor, kernel, caliper matching), and adjusting the handling of unmatched cases. This approach allows us to evaluate the sensitivity of our results to these methodological choices, ensuring that assumptions and matching strategies do not affect our conclusions. Thus, our sensitivity analysis will provide a deeper understanding of the reliability and generalizability of our findings.

The use of propensity score matching (PSM) comes with the risk of reducing generalizability due to incomplete matching (Seeger et al., 2005). While PSM will be applied selectively to metrics as the need arises, matching will likely be incomplete, given the numeric and demographic discrepancies between the states used in the analysis. As a result, it will be impossible to disprove that the unmatched population exhibits a treatment effect not present in the matched population. Therefore, each use of PSM and the selection of matching variables will be carefully weighed against the loss of generalizability. Furthermore, PSM functions best with a limited number of covariates: it has difficulty handling large volumes of covariates. The research team will thus be careful about covariate selection (Seeger et al., 2005). Some potential covariates include race/ethnicity, gender, and age as straightforward demographic controls.

Thematic Analysis for Qualitative Data

The primary method of qualitative data analysis will be thematic analysis, an approach that identifies, analyzes, and reports patterns within the interview data. The process begins with a thorough reading of the interview transcripts, allowing the research team to immerse themselves in the data and gain a comprehensive understanding of the participants' narratives. Next, meaningful segments of text are labeled with initial codes, capturing specific concepts related to administrative burdens, continuity of care, and the impacts of Medicaid policies.

The research team then examines these codes and groups them into broader categories that reflect key themes within the data. For example, themes might include topics such as "barriers to MCO enrollment," "challenges with administrative procedures," and "continuity of care improvements." The contents of each category are then condensed to distill their essence, creating a narrative that reflects participants' views and experiences. Finally, these summaries are synthesized into a cohesive interpretation, highlighting patterns, variations, and broader implications of the data in relation to the study's objectives. The research team will use the NVivo software package to manage and analyze the qualitative data.

5) Data Sources

(1) Illinois Medicaid Data

- *Medicaid Enrollment Data*

The data will contain information regarding the program eligibility and enrollment status of people who applied for Medicaid, including MCO enrollment start and end dates, as well as enrollees' socio-demographic characteristics (e.g., gender, race/ethnicity, income). This data, covering three years prior to the demonstration and five years post-demonstration, will be provided by the Illinois Department of Healthcare and Family Services.

- *Medicaid Claims Data*

Medicaid claims data will include the records from both fee-for-service (FFS) providers and MCOs. The research team will focus particularly on data containing a record of the actual healthcare services provided and the associated financial transactions. This administrative claims data contains information on items such as (1) date and location of service, (2) type and cost of service, (3) procedures performed, (4) extent of service (e.g., days in hospital), (5) beneficiary demographics such as age, gender, and location of residence, and (6) program information for the beneficiary, such as type and dates of coverage or information needed for billing and mailing purposes. The Illinois Department of Healthcare and Family Services will provide this data for almost three years before the demonstration and five years post-demonstration. Illinois Medicaid claims data will be obtained via direct access to the State of Illinois Department of Healthcare and Family Services Electronic Data Warehouse (EDW), which contains all Medicaid claims submitted to the state and is updated as claims are made.

- *Administrative Records Data*

Administrative record data includes data sources for measuring backlogs. The Illinois Department of Human Services (IDHS) and the Illinois Department of Healthcare and Family Services (HFS) collaborate to report findings from the data quarterly. Given that the state of Illinois is mandated to determine Medicaid eligibility within 45 days, the data used to measure backlog results include total applications on hand by number of days on hand, the number of applications pending for more than 45 days, and the number of pending applications by basis for determining income eligibility.

(2) Comparison State Data

- *Transformed Medicaid Statistical Information System (T-MSIS) Analytic Files (TAF)*

The data will include all claim records submitted by providers in Iowa and Wisconsin, with the exception of long-term care claims, as those are not pertinent to analysis of the waiver. The data will cover almost three years prior to the demonstration and the five years following the demonstration. Also, the data will contain enrollment data, allowing for the continuity of coverage rates in Iowa and Wisconsin to be measured and compared to the continuity of coverage rates in Illinois.

Accessing this data will require several steps. First, the research team will obtain approval for a participant-consent-exemption from the University of Illinois' Institutional Review Board (IRB) as required for the use of protected health information (PHI) archival data. Next, the research team will include this IRB approval in at least two applications for the T-MSIS files sent to CMS's vendor of Medicaid data: the Research Data Assistance Center (ResDAC). These applications will include the request for the re-use of Iowa data, which the team has already purchased for another 1115 evaluation as a comparison state, and an application for the purchase and use of Wisconsin's Medicaid data for the first time by the evaluation team. Once ResDAC's administrative reviewer, technical advisor, and executive advisor approve these applications (a process that may take several months), the team's funder— the Office of Medicaid Innovation (OMI)— will approve an invoice already included in the approved project budget. Finally, the approved and funded data request will be sent to CMS for processing, following which the data will be shipped in a secure physical format to the research team's data storage partners at the National Center for Super Computing Applications, who have already

received permission to store Medicaid and Medicare data via an approved Data Management Plan Self-Attestation Questionnaire (DMP-SAQ) through ResDAC.

(3) Stakeholder Interviews

Interviews will be conducted to evaluate the impact of the demonstration on continuity of care and administrative simplification. These interviews will engage key stakeholders, including Illinois Medicaid administrators and healthcare providers, particularly those working in hospitals in Illinois.

The interviews will focus on two primary themes. The first of these is continuity of coverage in the absence of HPE program. This will include examining timely enrollment in Medicaid and the churns between Fee-For-Services (FFS) and managed care. The second theme is the administrative workload before and after the demonstration. Questions will address time and expenses related to reenrolling beneficiaries who submit late redetermination paperwork to managed care, and the administrative efficiencies gained through waiving the HPE program.

We anticipate conducting interviews with approximately 25 stakeholders, including Illinois Medicaid staff members and providers, within two to three years after the demonstration implementation. The format of these sessions, whether individual interviews or focus groups, will be determined based on feasibility considerations.

(4) Data Sources Considered and Excluded

To provide the most thorough analysis, the research team assessed the utility of the following data sources for a comparison of Illinois Medicaid recipients' health outcomes and quality of care with those of other states. However, the two assessed datasets and the possibility of a survey presented significant limitations to the proposed analysis, leading to their exclusion from the final analysis.

- *Behavioral Risk Factor Surveillance System (BRFSS)*

The BRFSS is an annual national survey jointly administered by the Centers for Disease Control and Prevention and state health departments. The data include information on health status and health risk behaviors and allows for comparisons of health outcomes in Illinois with outcomes in other states. From 2015 to 2019, the Illinois BRFSS fielded 37,000 surveys and polled a different set of counties each year, which may make it challenging to identify Medicaid-specific subgroups within Illinois. Using raw data obtained from the CDC, the research team determined that Illinois has fewer than 500 respondents to BRFSS per year, as do the comparison states. Additionally, BRFSS does not ask respondents if they are enrolled in Medicaid, but only whether Medicaid is their primary insurance. This means that the BRFSS population is not appropriate for an evaluation of all Medicaid beneficiaries in Illinois, as this population is not limited to those who primarily use Medicaid. Given the limitations of the sample size and the fact that the survey population did not fit the evaluation's scope, BRFSS was excluded as a secondary dataset for the evaluation.

- *Medical Expenditure Panel Survey (MEPS)*

MEPS is a national data source measuring how Americans use and pay for medical care, health insurance, and out-of-pocket spending, including family-level and individual-level information on health status, medical events, health insurance coverage, and satisfaction with care. The survey had five waves of interviews over a two-year period. MEPS also includes a

survey of medical care providers that supplements the household survey related to medical events and costs. Like BRFSS data, MEPS has limitations regarding sample size, with only 27,322 individuals sampled nationwide in 2021. Furthermore, the MEPS dataset accessed by the research team did not assign respondents to states, meaning that while the entire sample population has used Medicaid benefits, the location of the beneficiaries is unknown. Due to this limitation, MEPS was ruled out as a secondary data source, as the entire evaluation hinges on having state-specific data. While the research team will continue to investigate state-specific MEPS data sources, the shortcomings pertaining to sample size likely preclude the use of MEPS data regardless of location availability.

- *Beneficiary Survey*

The research team discussed, at length, the feasibility of conducting a survey of Medicaid beneficiaries in Illinois alongside the stakeholder interviews to increase the evaluation's overall context. However, because the survey would collect sensitive PHI, it was determined that the logistics of contracting with an outside service (such as Mechanical Turk or Qualtrics) to disseminate the survey would introduce many issues related to privacy, data security, and data sharing agreements between the contractors and the research team. Dissemination via the research team was also considered; however, G*Power analysis revealed that the research team would need to collect approximately 400 responses to be representative of the Illinois Medicaid beneficiary population. While the distribution of a mail survey was considered because the Illinois Electronic Data Warehouse contains beneficiary addresses, the team expected low response rates for various reasons, including the fact that no incentive would be offered. Dissemination via phone was then considered, but this survey method would consume a large portion of the research team's time without mitigating the concerns about a poor response rate and introducing further data security concerns. Thus, the research team concluded that the analytic benefits of gathering data via a survey would be outweighed by the costs.

Furthermore, there is already a large cadre of appropriate measures (the Core Set of Health Care Quality Measures) included in the plan, meaning that the information related to healthcare quality and satisfaction captured by the member survey has been already collected by other means. This further increases the justification for not conducting a member survey given the logistical challenges it poses.

D. Methodological Limitations

The proposed evaluation has limitations. The qualitative interviews are limited in several ways, the foremost due to the cross-sectional, retrospective nature of the interviews. Because the waiver has already gone into effect, the research team plans to conduct one-time interviews. As a result, the quality of the data collected may suffer due to the passage of time if respondents struggle to remember the quality of care prior to the waiver. This uncertainty may suppress the observed or reported treatment effect. The research team also intends to conduct the interviews only within Illinois, which means the data collected cannot be set against a comparison state, somewhat dampening the power of the interview data.

Other limitations pertain to the quantitative aspects of the evaluation. In a natural experiment setting, it is difficult to know with certainty which factors of experiments lead to change. It is also unclear how much the experiment resembles the event in real life, which raises

questions about the external validity of the findings. However, the inclusion of a comparison group will largely address the limitations inherent to any time-series analysis.

There may be factors that we cannot control that affect Medicaid coverage and continuity of care. Such factors would include the local implementation of Medicaid policies and caseworkers' practices, which can affect care coordination and the monitoring of client redetermination paperwork. Records from the pretest period may not be as comprehensive as we wish, and data lags may arise that impact our ability to access the most recent Illinois Medicaid data. Moreover, the observational period spans the COVID-19 PHE, an issue we discuss in more detail in the next section.

Any inequivalence between the waiver state and comparison state/group (e.g., selection bias) prevents us from making valid causal inferences about the waiver administration and the outcome variable. Furthermore, while the team has mitigated the shortcomings of the comparison states by choosing two separate states through objective mathematical measures, there is no perfect comparison state. However, ITS is a robust approach even without a control series, meaning the results will still be strong. Finally, the research team has made allowances for the use of propensity score matching to compare outcomes at the individual level should state-level comparisons be insufficient; the limitations of propensity score matching have been acknowledged in the methods section, and the research team will select the most powerful analysis for each metric to reduce limitations and increase generalizability to the fullest extent.

Although we anticipate using the pretest/posttest method as little as possible, if at all, its use will introduce a limitation. This method uses just one data point pre- and post-intervention, ultimately limiting the conclusions that can be drawn from such a small sample. This approach also excludes time as a factor from the analysis, meaning that it cannot account for underlying trends.

The Section 1115 demonstration waived the requirement for implementing the HPE program in Illinois. However, prior to this waiver, the HPE program had not been introduced in the state. Evaluating an initiative that was never put into practice in Illinois is challenging, particularly with a quantitative approach. To address this limitation, we will conduct qualitative interviews with stakeholders to gain their perspectives and insights on the efficacy of waiving HPE.

Methodological Considerations Relating to the COVID-19 Pandemic

The COVID-19 pandemic in the United States began in approximately March 2020, whereas the demonstration of this waiver began in January 2021. The highest spike of the COVID-19 hospitalization rate in Illinois was in January 2022, followed by November 2020 (CDC, 2024). Illinois also had higher vulnerability than most states, with 34% of the population residing in a densely populated, high-vulnerability area, which correlated with a higher risk of infection and adverse health outcomes (Surgo Ventures, 2020). Social distancing and stay-at-home orders took effect statewide on March 21, 2020. Simultaneously, federal section 1135 waivers granted the Secretary of the Department of Health and Human Services the flexibility to temporarily modify Medicaid, and this modification played a significant role in shaping the pandemic response. In many ways, the COVID-19 pandemic has likely impacted this waiver evaluation, particularly during the initial two years of the waiver and the immediate pre-waiver period, because of the high hospitalization rate and subsequent policy changes.

Furthermore, during the pandemic and the years following, Illinois Medicaid witnessed significant fluctuations in enrollment numbers, and we expect such variations to continue. Extensive job losses and economic instability during the pandemic caused a substantial surge in Medicaid enrollments in 2020. According to a preliminary dataset released in September 2020 by the U.S. Bureau of Labor Statistics and the Illinois Department of Employment Security, all 14 of Illinois's metropolitan areas experienced a decrease in the number of nonfarm jobs over the year. Until the public health emergency concluded in May 2023, under Families First Coronavirus Response Act (FFCRA) Maintenance of Eligibility (MOE) requirements, existing Medicaid enrollees had automatic continuous coverage. The state anticipates data will reveal significant coverage losses and disruptions due to the resumption of the redetermination process. Findings with respect to the continuity of coverage, measured by the number of enrollees in continuous years, will be interpreted in light of this expectation. The section below explains the methodological considerations that will enable that interpretation.

Strategies to Consider

The initiation of the waiver demonstration in January 2021 coincided with the continued impact of the COVID-19 pandemic and PHE. Consequently, the pandemic heavily influenced period preceding the demonstration (March 2020 to December 2020, referred to in Figure 4.2 as the Pre-waiver Period 2). The two years following the waiver demonstration were also under the influence of the PHE until Illinois resumed resource tests in May 2023. Additionally, flexibilities authorized under the Disaster State Plan Amendment, effective until May 2024, included policies likely to affect the continuity of coverage, such as (a) presumptive eligibility for Modified Adjusted Gross Income (MAGI) adults and (b) frequent presumptive eligibility for children, pregnant women, and adults, and (c) self-attestation of income, incurred medical expenses, residency, disability status, insured status, and immigration or citizenship status when electronic verification was not available.

Depending on the magnitude of pandemic-induced changes, isolating the effects of the pandemic from those of the waiver demonstration may pose a challenge. We plan to employ some adjustments in our proposed analytic strategies to address this, determining if COVID-19-related effects differ across states so as to disentangle the impacts of COVID-19 from the effects of the demonstration.

Using a comparison state that experienced similar external influences related to the pandemic but did not receive the specific intervention being implemented provides a strategy for disentangling COVID-19's impact on outcome measures from the waiver's effect on those outcomes. Additionally, we aim to enhance comparability by utilizing propensity score matching to match the state's beneficiaries with the comparison groups. This approach contributes to the robustness of difference-in-differences and comparative interrupted time series designs.

To ensure our metrics are suitable for a difference-in-difference analytic approach, we will secure about two years of pre-COVID data spanning from January 2018 to February 2020. These data will capture the average difference in outcomes between the demonstration state and the comparison states before the pandemic. Consequently, the analysis will evaluate the waiver's impact based on both pre-COVID data (January 2018 – February 2020) and post-waiver data (May 2023 – December 2025), excluding periods affected by the pandemic and PHE (March 2020 to April 2023). Additionally, another model will incorporate fixed effects for each

segmented phase (Figure 4.2) and their interactions with the treatment indicator variable. This inclusion will explain how the waiver effect varies over time. Observing consistency in the waiver effect across different segmented phase will enhance the robustness of the analysis.

We also propose using a comparative interrupted time series model to discern the impact of COVID-19 and PHE continuous enrollment. Typically, this model analyzes data collected over a period during which an intervention might induce significant change. However, the ongoing disruption from March 2020 to April 2023 makes it impractical to exclude specific time frames from the analysis. Therefore, we propose assessing the impacts of COVID-19 and PHE continuous enrollment by using dummy variables for pre-waiver (2) and post-waiver (1) periods, as shown in Figure 4.2. This method provides a nuanced understanding of how these external factors, alongside the waiver's impact, affect outcomes. Separate dummy variables will be included to evaluate the distinct impact of each external factor while examining the waiver's impact.

E. Timeline

Task	Projected Dates
Evaluation Contractor Data Processing	
Determine required variables, the timeline of variables (monthly, quarterly), and the dates needed for the proposed evaluation.	August 2023
Request and receive access to Illinois Medicaid Enrollment and Claims Data.	September 2023 – February 2024
Evaluation contractor receives data and examines it for accuracy and feasibility.	March 2024
Evaluation contractor processes data – cleaning and merging received data files.	April 2024- June 2024
Qualitative Interview Data Collection	
Develop interview protocol, consent forms and recruiting materials	February 2024- July 2024
Submit qualitative interview materials for IRB study approval	July 2024- August 2024
Conduct qualitative interviews for eventual inclusion in final report.	August 2024- December 2025
Initial Data Analysis and Interim Report Writing	
Conceptualization and variable construction.	June 2024 – July 2024
Descriptive statistics for Goals #1, #2, #3, #4.	August 2024 – September 2024
Bivariate analyses & pretest/posttest for Goals #1, #2, #3, #4.	August 2024- October 2024
Draft interim evaluation report and develop interim report update to CMS.	October 2024 – November 2024
Interim Evaluation Report Due	December 2024
Accessing Comparison State Data	
Investigate state datasets and waiver status to determine a suitable comparison of state datasets.	July 2023 – September 2023

Determine required variables, number of cases, timeline, dates, and other required information to include in the request.	September 2023
Develop a security plan for data transfer and data sharing between the University of Illinois and the comparison state's data custodian.	December 2023
Submit a request and process payment to access 2018 to the most current comparison state data.	February 2024
Estimated date of receipt for comparison state dataset.	February 2025
Additional data requests for subsequent year(s) of the dataset.	February 2025
Processes data – cleaning and merging received state datasets.	March 2025 – December 2025
Evaluation Analysis	
Interrupted time series (ITS) analysis for Goals #3 and #4.	January 2026 – June 2026
Code and conduct thematic analysis of qualitative data.	January 2026 – June 2026
Propensity score matching (PSM) and/or logistic regression and/or Difference-in-differences (DID) approach for Goals #1, #3, and #4.	March 2026 – June 2026
Summarize analysis findings for the demonstration evaluation.	July 2026 – December 2026
Compile Analysis Summaries and Develop Final Summative Evaluation Report	January 2027 – May 2027
Summative Evaluation Report Due	June 2027

F. Evaluation Budget FY 2022 2027

Task	**2022 actual**	**2023 actual**	**2024 estimate**	**2025 estimate**	**2026 estimate**	**2027 estimate**
Management, Consulting, Reporting, Supervising		35,046	33,021	34,232	35,258	36,316
Data Management, Cleaning, and Analysis		21,193	43,741	116,506	120,001	123,601
Qualitative Interviews and Analysis				15,162	15,616	16,084
Graduate Assistants	15,908	43,092	79,815	60,646	62,466	64,340
Fringe Benefits (46.38%,10.35%GRA)	1,395	27,071	38,881	77,758	80,091	82,493
T-MSIS Data for Iowa and Wisconsin			96,500			76,000
NCSA Billable Data hours				15,107	15,107	15,107
Misc. Services and Telecom (see details in narrative)		1,084	6,478	10,056	10,056	10,056
Lease Charge (prorated per FTE)		2,144	10,386	17,598	17,598	17,598
Supplies (computers and monitors)			3,400	5,594	5,594	5,594
ICR 21.7% of MTDC	3,755	24,499	46,812	108,296	74,689	76,729
Total	21,058	154,129	359,034	460,955	436,476	523,918

Additional information regarding the cost of comparison State Data for Iowa and Wisconsin, in addition to the amount budgeted above. All data will be purchased at one time.

Iowa and **Wisconsin** (Cohort: 2,984,145)	**Years**	**Fee Per Data-Year**	**Total**
T-MSIS Analytic Files (TAF)*:			
DE (Demographic and Eligibility)	2018-2025	$ 4,000	$ 28,000
IP (Inpatient Hospital)	2018-2025	$ 4,000	$ 28,000
RX (Prescription Drug)	2018-2025	$ 5,000	$ 35,000
OT (Other Services)	2018-2025	$ 5,000	$ 35,000
LT (Long Term Care)	2018-2025	$ 5,500	$ 44,000
T-MSIS Bridge File	2020	$ -	$ -
Finder File Fee	-	$ -	$ 2,500
TOTAL			$172,500*

*Excluding taxes, fees, shipping, etc.

The budget request from FY 2025 through 2027 is $1,509,348. There is a 3% increase from year to year to accommodate cost-of-living and inflation adjustments over time.

Evaluation Budget Narrative

The primary cost for this project is the staff time required to design the evaluation plan, analyze the outcome data, and prepare a report. Additional expenses, as applicable, are listed below as well.

Project Management, Consultant, Supervision and Reporting

Chi-Fang Wu is a Professor in the School of Social Work at the University of Illinois Urbana-Champaign. As the Project Investigator (PI), Dr. Wu will oversee all aspects of the project, including quality control, fiscal spending, hiring and training of research assistants, leading project team meetings, managing data collection and analysis, and writing evaluation designs and reports. Dr. Wu's leadership will ensure that project administration, analysis, and reporting requirements are met for the Illinois Department of Healthcare and Family Services and the Centers for Medicare and Medicaid. **Budget request: 22% salary.**

Douglas Smith is the Director of the Center for Prevention Research and Development (CPRD) and a Professor in the School of Social Work at the University of Illinois Urbana-Champaign. He will serve as a consultant for this project. He will provide consultation on the development of the project's data collection and analytic methodologies to ensure the development and implementation of a robust evaluation plan. He will also review the evaluation design and reports. **Budget request: 5% salary.**

Crystal Reinhart is a Senior Research Scientist at CPRD and the Center's liaison for compliance with the Health Insurance Portability and Accountability Act (HIPAA). As a Project Manager for PO19, she will supervise CPRD staff, including task management, prioritization, timelines, and HIPAA compliance. She will also oversee the data management for this project on the Nightingale cluster at the National Center for Supercomputing Applications (NCSA). Finally, she will be responsible for developing and editing reports for the Illinois Department of Healthcare and Family Services and the Centers for Medicare and Medicaid**. Budget request: 15% salary.**

Data Management, Cleaning, and Analysis

Shahana Begum is a Senior Research Data Coordinator and serves as the CPRD senior statistician. In her capacity as a Statistical Analysis Leader, she will play a pivotal role in mentoring and coaching the project's Research Data Specialists as they conduct complex analyses of the project. Through effective leadership and a comprehensive understanding of analytical methodologies, she will enhance the team's performance and actively contribute to the overall success of the evaluation project**. Budget request: 10% salary.**

Aidan Berg is a Research Data Specialist at CPRD. As a Research Data Specialist for the project, he will perform various tasks related to the statistical analysis of the 1115 waiver. Responsibilities will include data importation, cleaning, transformation, analysis, and visualization. He will run analyses on the cleaned data using advanced statistical techniques (e.g., comparative interrupted time series analysis, difference-in-differences analysis, pretest-post-testing, and propensity score analysis) and more routine techniques such as t-tests, descriptive analysis, or crosstabulation. Furthermore, he may be required to write the results of the analysis and draw conclusions from them, writing in both a technical and accessible nature to ensure the readability of the overall evaluation. Mr. Berg's appointment to this evaluation began at .50 FTE and will be shifting to 1.0 FTE in 2025. **Budget request: 100% salary.**

Janaka Kosgolla, is an Assistant Research Scientist at the University of Illinois Urbana-Champaign who will lead the quantitative data extraction and analysis within the EDW and NCSA clusters. He will be responsible for developing SQL codes for all the planned quantitative measurements to be executed on the EDW and NCSA cluster databases. He will adopt existing methods and technical specifications and develop new ones to write SQL programs to extract the correct information from the Medicaid data stored in both databases. In addition, he will develop base codes required to run propensity score matching and any other analysis procedure we need to execute in the Linux/Unix environment of the EDW and NCSA cluster. He will develop and test an R base code that performs propensity score matching on the NCSA cluster. Dr. Kosgolla began work on this project as an RA but will transition into full-time employment with CPRD in 2025, leading to an increase in the data analysis and cleaning budget across 2025-2027. **Budget request: 75% salary**.

Graduate Assistants and Qualitative Interviewer – This budget item supports the two Research Assistants (50% FTE) (beginning in 2023), and one Qualitative Interviewer (25% FTE) (beginning in July 2024) to complete supporting tasks, including but not limited to assisting with data analyses, collecting qualitative data, cleaning data for project staff to fulfill data, conducting literature reviews, and writing report requests on the evaluation project. The qualitative interviewer will be required to schedule interviews (including recruiting interviewees), conduct interviews, and collaborate with the research team to code the collected qualitative data before it is analyzed. **Budget request: two 50% RA (from 2023) and one 25% RA (from July 2024).**

Fringe Benefits are in accordance with the Negotiated Fringe Cost Rate Agreement with the Office of Naval Research. For this proposal, the Fringe Benefit Rate is calculated at 46.38% for all full-time staff (retirement 11.98%; health, life, dental 32.20%; workers' compensation 0.01%; termination 0.74%; and Medicare 1.45%). The fringe benefit rate is updated annually and

approved by the Federal government near the beginning of each fiscal year. Changes in fringe benefit rates are assessed immediately when they become effective.

Comparison State Data: This budget item supports the important states' Medicaid data, such as Iowa and Wisconsin, for project staff to fulfill data and report requests on the evaluation project. Without comparison state data, robust analysis of the 1115 waiver's impact is not possible, since the only possible comparison will be to Illinois' past performance on the chosen metrics, which introduces confounding variables. Adding comparison states is an efficient way to improve the reliability of the analysis proposed by this plan, while also addressing concerns related to data quality, and the effects of the COVID-19 pandemic and PHE, since the comparison states may be used to determine if disruptions in trends can be attributed to the PHE. Furthermore, use of a comparison series is highly recommended by CMS to evaluate 1115 waiver impact.

NCSA Billable Hours include time spent uploading, securing, and managing CPRD's database on Nightingale, a HIPAA-compliant supercomputing cluster at the National Center for Supercomputing Applications. NCSA also provides limited consulting services regarding software and data management.

Materials/Supplies – The materials and supply costs include, but are not limited to, the purchase of computer equipment, including computers, monitors, docking stations, speakers, cameras, headsets, and other accessories.

Data Processing Services will be provided through CPRD's pool service account, which will be used for data entry, data cleaning, scanning and processing, data preparation and shipping, online survey development, and report creation. Data Processing Services uses Qualtrics and Teleform for survey creation. Data Processing Services also conducts test case development, quality assurance, and regression testing for online web applications. For the PO19 Evaluation project, Data Processing Services staff will assist with report generation, proofing annual reviews, and survey development. They will conduct test case development and quality assurance for the planned enhancements to the Prevention Hub application. The established data processing service rate is $47.79 per hour. The data processing expense is calculated by taking the established rate per hour multiplied by the number of hours required to meet the project deliverables.

Lease, Facilities/Administration and Other Miscellaneous

Copying will be performed on CPRD-owned copiers, which are charged to projects by the page. Black and white copies are $0.03 per copy and color copies are $0.07 per copy. CPRD creates copies of materials from each provider being reviewed during the annual review process so that project team members can easily read, assess, review, and write the results in a report.

Annual Desktop Support (Technology Services) for CPRD is independent of the University of Illinois campus. Its Technology Services Client Support Group (TS) provides desktop support for an annual fee including standardized charges, server support, and flexible charges calculated by the established rate multiplied by the number of full-time employees (FTEs) assigned to the project team.

CPRD's Files 2 Server Support is housed at Administrative Information Technology Services (AITS), a central campus unit located within the University of Illinois. AITS will host the file server infrastructure (including, but not limited to, file server, file server maintenance, backup systems, security groups) for all grants. The annual fee is determined by AITS and charged to each grant.

Server and Storage (Technology Services) will be provided by the TS Field Consulting Team, which is located within the University of Illinois. This team will host the infrastructure (including, but not limited to, servers, server maintenance, backup systems, software, security groups) for grants that require custom web applications and/or SQL databases. The annual fee is determined by TS and charged for each custom application(s) and/or database hosting in FY24.

Field Consulting Services (Technology Services) will be provided by the Technology Services Field Consulting Team, which will provide dedicated hours to support and maintain the infrastructure (including, but not limited to, servers, server maintenance, backup systems, software, security groups, and DBA support) for grants that require custom web applications and/or SQL databases. The hours for this effort will be determined by TS and charged to each grant for each custom application(s) and/or database hosting in FY24.

Computer software costs will include the purchase of software, including but not limited to software for project staff to fulfill data and report requests on the evaluation project.

Other Costs will include but are not limited to the costs incurred by hiring staff for the evaluation, such as background checks.

Occupancy Charges will be paid to CPRD, which is located off the University of Illinois campus, where it leases its space. The lease rate includes office space and infrastructure and maintenance to support an 8,000-square-foot building. All grants and projects are charged for space. The occupancy charge is calculated by the number of FTEs assigned to the project multiplied by the established rate of $480.83 (the mean cost per FTE from each quarter of the prior year) multiplied by 12 months.

Facilities and Administration costs will be calculated under the University of Illinois Urbana-Champaign's federally negotiated indirect cost rate agreement with the Office of Naval Research. In accordance with the provisions of the Grant Accountability and Transparency Act, a federally negotiated indirect cost rate will be used for all proposal submissions. In line with the methodology provided to the University by the Governor's Office of Management and Budget's Grant Accountability and Transparency Unit, the rate reduction methodology will use the annual University-audited financial statements to calculate rate reductions against its federally negotiated indirect cost rates. The reductions account for all State of Illinois appropriations received and payments on behalf of the University. For the purposes of this proposal only, F&A is assessed at 21.70% MTDC.

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ILLINOIS

SCHOOL OF SOCIAL WORK
1010 W. Nevada Drive, MC-082
Urbana, IL 61801-3813

July 22, 2022

To Whom It May Concern:

This letter describes my status as an Independent Evaluator for the Illinois 1115 Continuity of Care & Administrative Simplification demonstration. I am a Professor and Ph.D. Program Director of the School of Social Work at the University of Illinois Urbana-Champaign (UIUC), where I have been involved in developing the evaluation plan in collaboration with UIUC's Center for Prevention Research and Development (CPRD). Our team will perform this evaluation under contract with the Office of Medicaid Innovation (OMI) and the Illinois Department of Healthcare and Family Services (HFS). HFS has asked OMI to secure an Independent Evaluator to support the Department's Continuity of Care (CoC) 1115.

This project's aims are fourfold: to increase access to health care coverage, to provide quality care, to improve health outcomes of Medicaid beneficiaries, and to reduce administrative burdens through care coordination and continuity of care initiatives. I have the expertise, skills, and leadership experience necessary to work collaboratively with the CPRD team to achieve the project aims. I am a qualified independent evaluator with over 20 years of experience researching poverty and the impact of public benefit programs on low-income families. My academic research is multifaceted, and spans topics related to poverty, social welfare policy, the impact of welfare reform on low-income families, access to public benefits and support services for low-income families, and program evaluation. My research has advanced efforts to identify the dynamics and effects of welfare reform and to understand whether and how public and private assistance helps low-income families meet their basic needs. Using sophisticated and innovative statistical methods, my work has produced new, meaningful insights into how individual policies (e.g., welfare sanctions) and programs (e.g., Medicaid), as well as multiple program participation, contribute to family well-being. Broadly, my research examines the effectiveness and accessibility of social safety net programs, including the types and combinations of benefits that best reduce material hardships and enhance the well-being of low-income families. I have extensive experience using advanced methods to analyze complex, longitudinal, state administrative data and national, population-based data, including adjusting for selection bias.

Beyond the advanced analytic competencies required to accomplish this evaluation, I also bring a granular knowledge of specific dynamics and effects of welfare reform among vulnerable populations, such as low-income single mothers and unemployed and underemployed heads of households. For example, I have developed a conceptual approach to categorizing long-term employment and earnings trajectories among welfare recipients and low-income families. This not only provides a portable approach for scholars with adjacent concerns, it has also enhanced my knowledge of the measurement issues pertinent to this project.

ILLINOIS
School of Social Work

Throughout the years serving as principal investigator or co-investigator on several university- and state-funded grants, I have established a successful record of study administration and project management by setting and completing achievable project goals, detailed work plans, and timelines.

I have worked collaboratively with OMI and HFS on the development of the evaluation plan. Dr. Douglas Smith, Director of CPRD, also consulted on the evaluation design efforts. Dr. Smith is currently working with the UIUC National Center for Supercomputing Applications to establish a technical environment to perform all necessary data analysis for HFS in his work on the the Behavioral Health Transformation 1115 and SUPPORT Planning Grant. The infrastructure and processes he established will facilitate my completion of the CoC 1115 evaluation. The collective experience of our evaluation team (please see description of team members below) and CPRD staff will ensure a fair and impartial evaluation free of any conflicts of interest. This impartiality will be reflected in the evaluation report prepared for this project.

Our evaluation team asserts that we have no interests, direct or indirect, that would conflict in any manner or degree with the performance of our services for this project. In the performance of this evaluation, no person with any known conflict of interest will be employed. The collective experience of our evaluation team will ensure a fair and impartial evaluation free of any conflicts of interest.

Sincerely,

[redacted]

Chi-Fang Wu, Ph.D.
Professor and Ph.D. Program Director
School of Social Work

University of Illinois at Urbana-Champaign (UIUC)-Personnel

Chi-Fang Wu, Ph.D. (Evaluator) is a Professor and Ph.D. Program Director of the School of Social Work at the University of Illinois Urbana-Champaign. Throughout her academic career, she has studied the impact of social policy on low-income families and the accessibility of public benefit programs and support services. She has led several projects examining the types and combinations of public benefits and private assistance received by low-income families with children. Her research also examines families who are most in need of government assistance (Chen, Wu, & Zheng, 2022), and whether and how public benefits help these recipients meet their basic needs and reduce their material hardship (Wu, Eamon, & Wang, 2014; Wu et al., under review). Her observation of broad patterns in benefit participation, which indicates that benefit-eligible families face barriers to participation, motivates her research (Wu et al., 2022).

Dr. Wu's research has also generated new insights into the dynamics and measurement of unemployment and underemployment in the U.S. She developed a new conceptual approach that enables her to (a) categorize measures of unemployment and underemployment and (b) analyze longitudinal national population-based data in order to measure levels and factors associated with unemployment and underemployment. The resulting findings conclude that underemployment, but not unemployment, was associated with lower levels of self-rated health among single mothers (Wu et al., 2014), which may be explained by inequity in health care access.

Dr. Wu's more recent research addresses the ways in which receiving specific public benefits buffers the negative effects of under- or unemployment on family well-being (Wu, Eamon, & Wang, 2017; Wu et al., 2022). Her findings indicated that when employment problems increased during the Great Recession and created material hardship, receipt of public benefits also rose nationwide (Eamon & Wu, 2013). She also found that while single mothers' likelihood of experiencing unmet medical needs increased during and after the Great Recession, health care coverage drastically reduced the risk of unmet medical needs for underemployed single mothers and moderately for unemployed single mothers (Wu et al., 2017). These results highlight how public benefits (particularly Medicaid) can mitigate the negative effects of underemployment and unemployment on low-income single-mother families, corroborating the growing body of evidence supporting the expansion of health insurance programs.

Dr. Wu has authored and co-authored nearly 40 articles published or accepted in peer-reviewed journals, including prominent journals in the social work field. She has also served as the principal investigator on multiple grants. Her research has contributed valuable new information on and approaches to studying how individual policies (e.g., sanctions) and programs (e.g., Medicaid) and multiple program participation contribute to family well-being. The Illinois 1115 Continuity of Care & Administrative Simplification demonstration will continue this trajectory. Dr. Wu will allocate 0.22 effort to this project throughout the project term.

Douglas C. Smith, Ph.D. (Consultant) is a Professor of Social Work and Director of the Center for Prevention Research & Development (CPRD) at UIUC. He has prior direct practice experience (a) working in residential substance use disorder (SUD) treatment and (b) providing case management services in state-funded facilities serving individuals from low-income backgrounds. His research focuses on SUD treatment outcomes among adolescents and emerging adults (ages 18-29 years). Dr. Smith has previously received funding to complete SUD treatment evaluations from the National Institutes of Health, the Substance Abuse and Mental Health

Administration, and the U.S. Department of Justice. His nearly 70 peer-reviewed publications largely focus on substance use disorder treatment outcomes. Dr. Smith is leading the Behavioral Health Transformation 1115 Demonstration Waiver Evaluation for HFS. He will complete the evaluation of HFS's Section 1003 SUPPORT Planning Grant. Dr. Smith will allocate 0.05 effort to this project throughout the project term.

Crystal Reinhart, Ph.D. (Project Manager) is a Senior Research Scientist at the CPRD. She received her Ph.D. in Community Psychology from Wichita State University in 2010. She is currently a project manager for the Behavioral Health Transformation 1115 Demonstration Waiver Evaluation and is working on the Illinois Youth Survey project. The data resulting from the latter has contributed to several peer-reviewed publications and collaborations with researchers statewide and enhanced understandings of substance use, perceptions of substance use, and a variety of other health and safety issues among middle and high school students. Dr. Reinhart will allocate 0.15 effort to this project throughout the project term.

Shahana Begum (Statistical Analysis Leader) is a Statistical Analysis Leader at the CPRD. She works with teams that conduct project evaluations, such as targeting community-based substance abuse prevention programs and improving the effectiveness of principals and middle school teachers to accelerate middle school reform. She has worked alongside Dr. Reinhart on the Illinois Youth Survey. Ms. Begum will allocate 0.10 effort to this project throughout the project term.

Aidan Berg, MPH (Research Data Specialist/Project Coordinator) is an epidemiologist at CPRD. He works mostly on Medicaid Policy Evaluations, including the Illinois Behavioral Health Transformation Waiver, investigating the effects of the 1115 Waiver on the Medicaid population in Illinois diagnosed with SUD using a variety of time-series analytic techniques. He has also worked alongside Dr. Reinhart on SUD stigma research. Mr. Berg will allocate 1.0 effort to this project.

Assistant Research Scientist (TBA). CPRD will hire one full-time Ph.D.-level analyst to work on the project. They will allocate 0.75 effort to this project.

Jeehae Kang and Soohyun Yoon are Ph.D. students supervised by Dr. Wu. Both will serve as Research Assistants (RAs), assisting with literature reviews, data cleaning, analyses, and report writing. They will allocate 0.50 effort to this project.