North Carolina Medicaid Reform Demonstration
Updated Evaluation Design Report:
Incorporating CMS Feedback Received on June 17, 2019 and October 24, 2019
November 7, 2019

## A. General Background Information

North Carolina's 1115 waiver entitled "North Carolina Medicaid Reform Demonstration" was approved by the Centers for Medicare & Medicaid Services (CMS) on October 24, 2018. This evaluation embeds two major elements of the demonstration: components related to the Medicaid and Health Choice delivery system in NC and components to address the State's needs related to the opioid use epidemic and general substance use treatment needs. The Substance Use Disorder (SUD) component began on July 1, 2019 and will expire on October 31, 2023. The remaining components of the waiver will begin no sooner than February 1, 2020 and will expire on October 31, 2024.

Plans for the waiver were initiated in 2015, when the NC General Assembly enacted Session Law 2015-245 to move the state's Medicaid and Health Choice programs away from reimbursing providers directly through fee for service payments to a system of paying private health plans on a capitated basis. The purpose of the NC 1115 Waiver is to improve Medicaid beneficiary health outcomes through the implementation of a new delivery system, to enhance the viability and sustainability of the NC Medicaid program by maximizing the receipt of high-value care, and to reduce substance use disorders statewide.

There are several large components to NC's 1115 demonstration, which are listed in Table 1. First, the State intends to transition most NC Medicaid and Health Choice enrollees into a capitated model of care from the fee-for-service system that exists in the state currently. This will be done in phases, by eligible populations. The first group will transition to Prepaid Health Plans (PHPs) beginning February 1, 2019. This group will consist of individuals statewide, who are not excluded from enrollment in PHPs and do not qualify for one of the behavioral health intellectual / developmental disability tailored plans ("BH I/DD Tailored Plans") or specialized foster care plans, described below. Later in the demonstration, Medicaid enrollees with severe behavioral health conditions, intellectual or developmental disabilities, and/or traumatic brain injuries who meet criteria established by the Department of Health and Human Services and current and former foster care youth[1] will be enrolled in separate capitated plans with specialized features that are customized for the needs of each of these groups. While most Medicaid enrollees will be covered under a capitated plan under the demonstration, several groups are excluded from participation, including Medicaid enrollees dually eligible for

[1] Medicaid only beneficiaries in foster care under age 21, children in adoptive placements and former foster youth who aged out of care up to age 26

Medicare[2], Medicaid enrollees who are eligible through the Medically Needy program, those with limited eligibility such as through family planning waivers, those presumptively eligible for Medicaid, and prison inmates receiving Medicaid covered inpatient services. In addition, Medicaid-only beneficiaries receiving long-stay nursing home services and Community Alternatives Program for Children and Community Alternatives Program for Disabled Adults enrollees are also excluded.

Table 1: Major components of the 1115 waiver demonstration and implemention dates

| Component | Current implementation date | Description of Implementation | Medicaid and Health Choice Beneficiaries affected |
|---|---|---|---|
| **Enhancement of benefits related to substance use disorder (SUD) treatments** | July 1, 2019 | | All receiving SUD services |
| **Standard Plans (SPs)** | February 1, 2020 | Statewide implementation | All standard plan enrollees[3] |
| **Advanced Medical Homes** | February 1, 2020 | Many primary care practices are already certified as AMH; Others will become certified after PHP launch | All receiving primary care from an AMH |
| **Enhanced Case Management and Other Services (ECMOS) Pilots** | Late 2020 | Pilots will begin delivering services to eligible PHP enrollees in selected regions | PHP enrollees in selected pilot regions in need of pilot services (only SP enrollees affected at launch) |
| **Behavioral Health and Intellectual/Developmental Disability Tailored Plans and Statewide Foster Care Plan** | 2021 | | All enrollees in a BH I/DD Tailored Plan or the |

[2] Dual eligibles will enroll in BH I/DD Tailored Plans at their launch for BH and I/DD services only and that medically needy and HIPP beneficiaries who are enrolled in the Innovations waiver will enroll in BH I/DD Tailored Plans at their launch.

[3] Does not include indiiduals who qualify for a BH I/DD Tailored Plan or the Statewide Foste Care Plan or those excluded from managed care (e.g., Dual eligible, Medically Need, those receiving limited benefits). Eligibility criteria for BH I/DD Tailored Plans can be found here. DHHS is in the process of establishing eligibility criteria for the Statewide Foster Care Plan.

| Component | Current implementation date | Description of Implementation | Medicaid and Health Choice Beneficiaries affected |
|---|---|---|---|
| | | | Statewide Foster Care Plan[4] |
| **Health Homes** | 2021 | On launch of BH I/DD Tailored Plans | Those eligible for a TP who are in a participating practice |

The second major component of the 1115 waiver demonstration involves the enhancement of benefits related to substance use disorder services, allowing the state to leverage federal financial participation for additional services to treat opioid use disorders and other substance use disorders. These newly covered services include services for substance use disorders (SUDs) provided to Medicaid enrollees who are short-term residents in residential and inpatient treatment facilities that previously were excluded from federal Medicaid payments because of the institution for mental diseases (IMD) exclusion, as well as other improvements in access to and standards of SUD care. The expansions in covered SUD services could affect all Medicaid and Health Choice enrollees with SUDs by increasing the covered treatment options available, but also by increasing access to SUD services broadly (new as well as existing services), potentially creating more capacity in service provision due to shifts to more appropriate care.

A third major component of NC's demonstration is the Advanced Medical Home (AMH) program. Building on its well-established primary care case-management program, the AMH will be used as a primary mechanism for delivering and coordinating care management services under managed care. PHPs will be required to deliver care management services and are mandated to contract with all "Tier 3" AMHs (further described below) for the provision of care management to many enrollees. The Department expects that 22 percent of beneficiaries will receive care management services through AMHs or PHPs (https://files.nc.gov/ncdma/Care-Management-Rate-Memo-20190724.pdf). These individuals will be identified by risk stratification tools, which are further described below. Providers can continue to receive fees as they did under the primary care case management program or can take on additional care management responsibilities in exchange for higher levels of reimbursement to be negotiated with the PHPs. The AMH program distinguishes practices by tiers, according to their care management responsibilities. As defined in the AMH manual for primary care providers (https://files.nc.gov/ncdma/documents/Providers/Programs_Services/amh/AMH_Provider-Manual_08272018.pdf): "In AMH Tier 1 and 2 practices, PHPs will retain primary responsibility for care management, and practices will be required to closely coordinate and interact with each PHP with which they have a contract. AMH Tier 3 is a more advanced phase for practices

[4] Eligibility criteria for BH I/DD Tailored Plans can be found here. DHHS is in the process of establishing eligibility criteria for the Statewide Foster Care Plan.

ready to take on care management responsibility, either alone or as part of a network of practices affiliated with a Clinically Integrated Network (CIN). PHPs will provide oversight for care management delivered in or on behalf of Tier 3 practices, but will otherwise delegate day to day care management responsibilities to the Tier 3 AMH practice or the system or CIN/partners with which they are affiliated." The distinction between Tier 1 and Tier 2 practices follows the same distinction from the current primary care case management program, with Tier 2 practices required to contract with a regional network, on top of the Tier 1 practice requirements such as after-hours availability and panel size. PHPs are required to contract with 100% of Tier 3 AMH practices in their service area. As of March 2019, there are already almost 2,800 practices which have been certified as AMHs, and almost 1,500 of these have been certified as AMH Tier 3 practices. The majority of PHP enrollees are expected to be served in an AMH of level 1-3.

Finally, NC's demonstration permits DHHS to establish a limited number of Enhanced Case Management and Other Services (ECMOS) Pilots in a subset of regions. These pilots will offer reimbursement for evidence-based, non-medical interventions that address housing, transportation, food, and interpersonal safety and toxic stress that are traditionally not covered by Medicaid. North Carolina will be able to evaluate the impact of the provision of these services on enrollees' health outcomes and healthcare costs. The Pilots will be evaluated in a separate evaluation plan, although Pilot participants will be identified in some of the analyses for the overall waiver.

### B. Evaluation Hypotheses and Research Questions

There are three stated goals of the demonstration:

- Measurably improve health outcomes via a new delivery system
- Maximize high-value care to ensure sustainability of the Medicaid program, and
- Reduce Substance Use Disorder (SUD)

The primary and secondary drivers, or pathways through which these goals will be achieved, are diagrammed below. Goal 3 is additionally broken out in more detail in the subsequent figure.

The primary drivers for both Goals 1 and 2 include an increased use of alternative payment models, providing care with a whole person orientation, enhanced access to care, and more use of evidence-based practices and medicines.

The use of alternative payment models is expected to increase through the use of prepaid health plans and provider-led entities (PHPs/PLEs), rather than the current Medicaid system. Contracts with PHPs/PLEs were developed assuming a slower growth rate, which thus incentivizes the plans to manage costs. PHPs and PLEs are permitted to use APMs to pay providers, which differs from the current design. Additionally, PHPs have more ability to place incentives upon providers to meet quality expectations. Likewise, the PHPs and PLEs are held

to quality expectations and other oversight/compliance by the State; this puts more emphasis on quality and value than existed prior to the waiver.

It is well known that medical care is only responsible for a fraction of a person's health; other factors like social determinants of health and the environment are also considerable drivers. An increased emphasis on a whole person orientation will improve beneficiary outcomes. A number of managed care initiatives specifically address social determinants of health; these include the ECMOS Pilots (and the spread of learning from those pilots), the resource platform linking needs to local assets, and mandated screening for patients' SDOH-related needs.

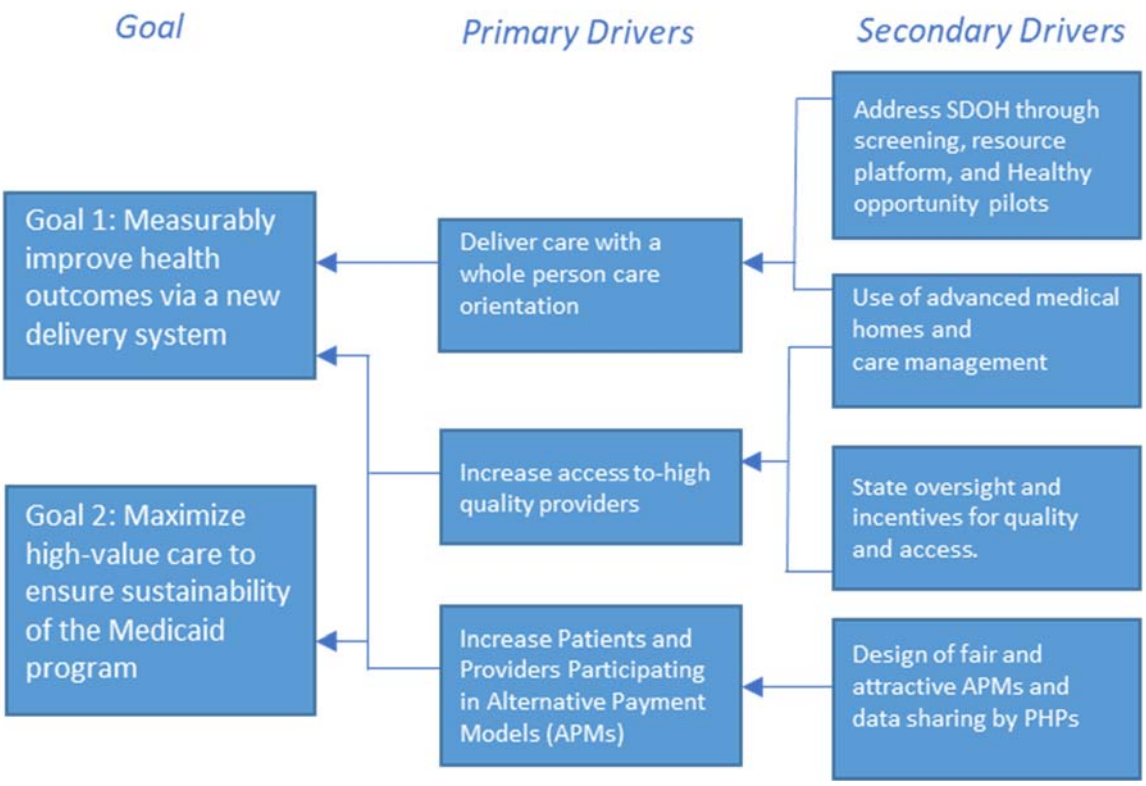
Multiple secondary drivers will improve the use of evidence-based practices (EBP). This driver is deliberately worded to account for both the recommendation of EBPs by providers as well as the ability and willingness of patients to participate in the EBP - ability to access recommended care (e.g. transportation needs met), trust in the provider's recommendation through shared decision-making, and adherence to the recommended treatment (e.g. medication). Some of the secondary drivers are focused on the provider side (e.g. quality improvement activity and shared data/transparency) while others are more focused on the patient and family (patient engagement, use of advanced medical homes). Likewise, oversight of the PHPs and providers will increase the practice of EBPs, and access to the resource platform will attenuate social barriers inhibiting patients' abilities to access evidence-based practices.

Finally, these primary drivers also improve the ability of patients to access care more generally. These will improve provider satisfaction and willingness to treat and manage Medicaid beneficiaries. As providers become more satisfied with the Medicaid program, more providers will be willing to manage Medicaid beneficiaries and many will increase the number of Medicaid beneficiaries they are able to manage.

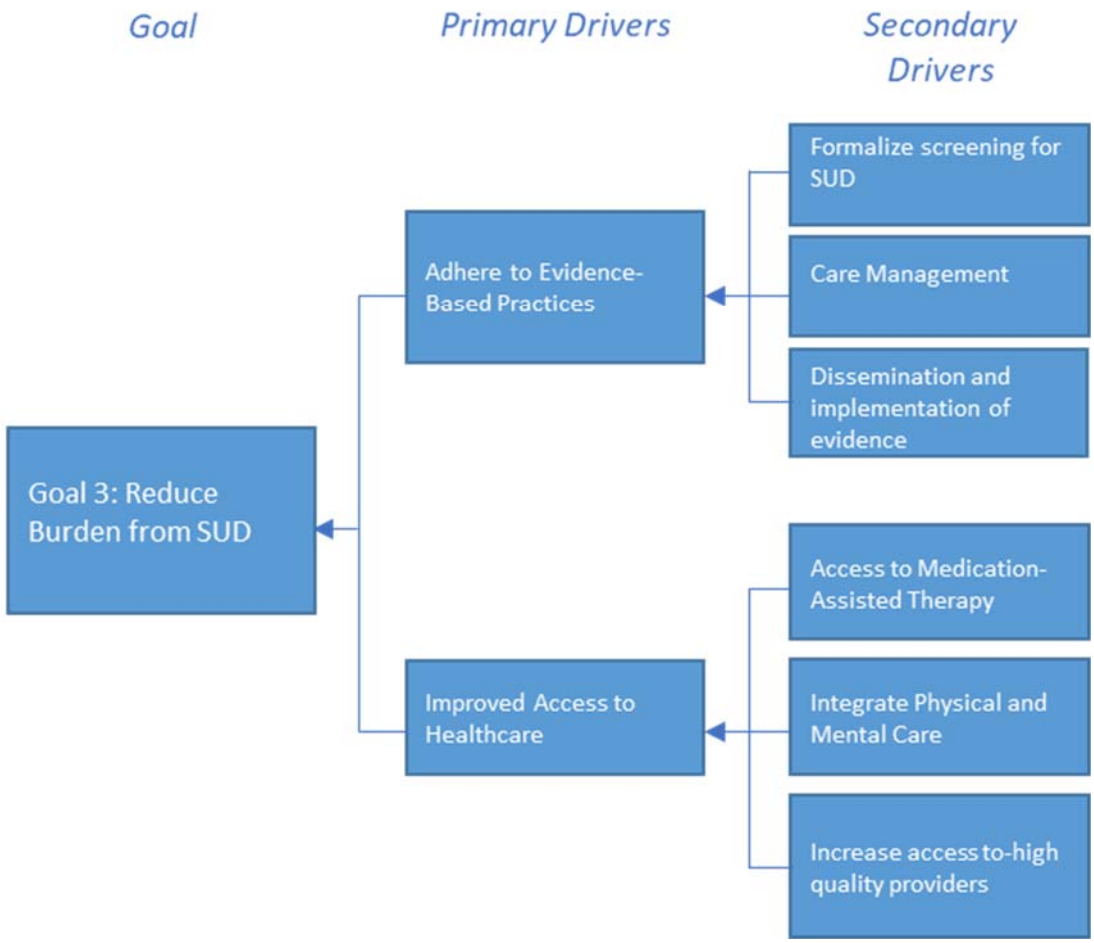
Goal 3 is "reduce substance use disorder." In the driver diagrams below, we provide additional detail on this goal - reduce the burden of substance use disorder, including mortality and morbidity. The primary design of the SUD element of the waiver is to more effectively provide beneficiaries with substance use disorders the high-quality care they need and reduce the long-term use of opiods.

The Goal 3-specific Driver Diagram focuses on drivers uniquely leading to Goal 3. Secondary drivers of better management, integration between physical and behavioral health, patient satisfaction with SUD treatment and an increase in MAT prescribers lead to treatment being provided in the most appropriate care setting, adherence to medications and SUD services (including, as above, the notion that providers need to be recommending EBPs as well), and improving rates of treatment and engagement with SUD treatment and providers.

**DRIVER DIAGRAM: GOALS 1 & 2**



**DRIVER DIAGRAM: GOAL 3**




Each of the three goals leads to a number of hypotheses which will be tested in the demonstration evaluation through the related research questions. These include:

**Goal 1: Measurably improve health outcomes via a new delivery system**

**Hypothesis 1.1** The implementation of Medicaid managed care will increase access to health care and improve the quality of care and health outcomes.

Research question 1.1.a Does the implementation of standard plans increase access to health care for those in the target population?

Research question 1.1.b Does the implementation of standard plans improve the quality of health care received by the target population?

Research question 1.1.c Does the implementation of standard plans improve health outcomes for those in the target population?

Research question 1.1.d Does the implementation of BH I/DD Tailored Plans increase access to health care for those in the target population?

Research question 1.1.e Does the implementation of BH I/DD Tailored Plans improve the quality of health care received by the target population?

Research question 1.1.f Does the implementation of BH I/DD Tailored Plans improve health outcomes for those in the target population?

Research question 1.1.g Does the implementation of specialized foster care plans increase access to health care for those in the target population?

Research question 1.1.h Does the implementation of specialized foster care plans improve the quality of health care received by the target population?

Research question 1.1.i Does the implementation of specialized foster care plans improve health outcomes for those in the target population?

**Hypothesis 1.2**: The implementation of Medicaid managed care will increase the rate of use of behavioral health services at the appropriate level of care and improve the quality of behavioral health care received.

Research question 1.2.a Does the implementation of standard plans increase the rate of use of behavioral health services at the appropriate level of care for those in the target population?

Research question 1.2.b Does the implementation of standard plans improve the quality of behavioral health care received for those in the target population?

Research question 1.2.c Does the implementation of BH I/DD Tailored Plans increase the rate of use of behavioral health services at the appropriate level of care for those in the target population?

Research question 1.2.d Does the implementation of BH I/DD Tailored Plans improve the quality of behavioral health care received for those in the target population?

Research question 1.2.e Does the implementation of specialized foster care plans increase the rate of use of behavioral health services at the appropriate level of care for those in the target population?

Research question 1.2.f Does the implementation of specialized foster care plans improve the quality of behavioral health care received for those in the target population?

**Hypothesis 1.3**: The implementation of Medicaid managed care will increase the use of medication-assisted treatment (MAT) and other opioid treatment services and decrease the long-term use of opioids.

Research question 1.3.a Does the implementation of standard plans increase the use of MAT for those in the target population?

Research question 1.3.b Does the implementation of standard plans increase the use of non-medication opioid treatment services for those in the target population?

Research question 1.3.c Does the implementation of standard plans decrease the probability of long-term use of opioids?

Research question 1.3.d Does the implementation of BH I/DD Tailored Plans increase the use of MAT for those in the target population?

Research question 1.3.e Does the implementation of BH I/DD Tailored Plans increase the use of non-medication opioid treatment services for those in the target population?

Research question 1.3.f Does the implementation of BH I/DD Tailored Plans decrease the probability of long-term use of opioids?

Research question 1.3.g Does the implementation of specialized foster care plans increase the use of MAT for those in the target population?

Research question 1.3.h Does the implementation of specialized foster care plans increase the use of non-medication opioid treatment services for those in the target population?

Research question 1.3.i Does the implementation of specialized foster care plans decrease the probability of long-term use of opioids?

**Hypothesis 1.4**: Implementation of Advanced Medical Homes (AMHs) and Health Homes (HHs) will increase the delivery of care management services and will improve quality of care and health outcomes.

Research question 1.4.a Does the implementation of AMHs and HHs increase the probability of receiving care management services?

Research question 1.4.b Does the implementation of AMHs and HHs improve the quality of care received?

Research question 1.4.c Does the implementation of AMHs and HHs improve health outcomes?

**Hypothesis 1.5**: The implementation of Medicaid managed care will reduce disparities (increase equity) in the quality of care received across rurality, age, race/ethnicity and disability status.

Research question 1.5.a Does the implementation of standard plans increase equity in the quality of care for those in the target population?

Research question 1.5.b Does the implementation of BH I/DD Tailored Plans increase equity in the quality of care for those in the target population?

Research question 1.5.c Does the implementation of specialized foster care plans increase equity in the quality of care for those in the target population?

**Goal 2: Maximize high-value care to ensure sustainability of the Medicaid program**

**Hypothesis 2.1**: The implementation of Medicaid managed care will decrease the use of emergency departments for non-urgent use and hospital admissions for ambulatory sensitive conditions.

Research question 2.1.a Does the implementation of standard plans decrease the use of emergency departments for non-urgent use?

Research question 2.1.b Does the implementation of standard plans decrease the use of hospital admissions for ambulatory sensitive conditions?

Research question 2.1.c Does the implementation of BH I/DD Tailored Plans decrease the use of emergency departments for non-urgent use?

Research question 2.1.d Does the implementation of BH I/DD Tailored Plans decrease the use of hospital admissions for ambulatory sensitive conditions?

Research question 2.1.e Does the implementation of specialized foster care plans decrease the use of emergency departments for non-urgent use?

Research question 2.1.f Does the implementation of specialized foster care plans decrease the use of hospital admissions for ambulatory sensitive conditions?

**Hypothesis 2.2:** The implementation of Medicaid managed care will increase the number of enrollees receiving care management, overall and during transitions in care.

Research question 2.2.a Does the implementation of standard plans increase the number of enrollees receiving care management?

Research question 2.2.b Does the implementation of standard plans increase the number of enrollees receiving care management during transitions in care?

Research question 2.2.c Does the implementation of BH I/DD Tailored Plans increase the number of enrollees receiving care management?

Research question 2.2.d Does the implementation of BH I/DD Tailored Plans increase the number of enrollees receiving care management during transitions in care?

Research question 2.2.e Does the implementation of specialized foster care plans increase the number of enrollees receiving care management?

Research question 2.2.f Does the implementation of specialized foster care plans increase the number of enrollees receiving care management during transitions in care?

**Hypothesis 2.3**: The implementation of Medicaid managed care will reduce Medicaid program expenditures.

Research question 2.3.a Does the implementation of standard plans reduce Medicaid program expenditures?

Research question 2.3.b Does the implementation of BH I/DD Tailored Plans reduce Medicaid program expenditures?

Research question 2.3.c Does the implementation of specialized foster care plans reduce Medicaid program expenditures?

**Hypothesis 2.4**: The implementation of Medicaid managed care will increase provider satisfaction and participation in the Medicaid program.

Research question 2.4.a Does the implementation of standard plans increase provider satisfaction?

Research question 2.4.b Does the implementation of standard plans increase provider participation in the Medicaid program?

Research question 2.4.c Does the implementation of BH I/DD Tailored Plans increase provider satisfaction?

Research question 2.4.d Does the implementation of BH I/DD Tailored Plans increase provider participation in the Medicaid program?

Research question 2.4.e Does the implementation of specialized foster care plans increase provider satisfaction?

Research question 2.4.f Does the implementation of specialized foster care plans increase provider participation in the Medicaid program?

**Goal 3: Reduce Substance Use Disorder (SUD)**

**Hypothesis 3.1**: Expanding coverage of SUD services to include residential services furnished in IMDs as part of a comprehensive strategy for treating SUD will result in improved care quality and outcomes for patients with SUD.

Research question 3.1.a Does the expanded coverage of SUD services increase the quality of care for patients with SUD?

Research question 3.1.b Does the expanded coverage of SUD services improve outcomes for people with SUD?

**Hypothesis 3.2:** Expanding coverage of SUD services to include residential services furnished in institutions for mental diseases (IMDs) as part of a comprehensive strategy for treating SUD will increase the use of MAT and other appropriate opioid treatment services and decrease the long-term use of prescription opioids.

Research question 3.2.a Does the expanded coverage of SUD services increase the use of MAT?

Research question 3.2.b Does the expanded coverage of SUD services increase the use of non-medication opioid treatment services at the appropriate level of care?

Research question 3.2.c Does the expanded coverage of SUD services decrease the probability of long-term use of opioids?

**Hypothesis 3.3:** Expanding coverage of SUD services will result in no changes in total Medicaid and out-of-pocket costs for people with SUD diagnoses, increases in Medicaid costs on SUD IMD services, increases in SUD pharmacy, outpatient, and rehabilitative costs, and decreases in acute care crisis-oriented, inpatient, ED, long-term care and other SUD costs.

Research question 3.3a Does the expanded coverage of SUD services change total Medicaid costs?

Research question 3.3b Does the expanded coverage of SUD services change out-of-pocket costs to Medicaid enrollees with an SUD diagnosis?

Research question 3.3c Does the expanded coverage of SUD services increase Medicaid costs on SUD IMD services, SUD pharmacy, outpatient, and rehabilitative costs?

Research question 3.3d Does the expanded coverage of SUD services decrease Medicaid costs on acute care crisis-oriented, inpatient, ED, long-term care and other SUD costs?

Research question 3.3e Does the expanded coverage of SUD services decrease Medicaid spending on non-SUD services for people with an SUD diagnosis?

**Evaluation Questions**

With the Demonstration goals, hypotheses, and research questions specified, a series of metrics were generated during the Evaluation Proposal Development period. The Evaluation will assess the degree to which the Demonstration was effective in achieving its goals and will examine the processes, facilitators and barriers experienced during the Demonstration period using these metrics.

The sections and tables below detail the quantitative measures to be used to test each hypothesis, the source or custodian of each measure, the sample or population to which the measure is relevant, and the proposed data sources. Measures were generated from the required PHP Quality Metrics, as specified in the RFP for PHPs, Section VII, Attachment E, page 37), the Quality Strategy, the SUD guidance document, and other public sources. Several of these measures will be employed for multiple hypotheses, to examine the effect of different components of the waiver on outcomes or in different Medicaid populations.The data sources and analytic methods are further described below.

**Goal 1: Measurably improve health outcomes via a new delivery system**

**Hypothesis 1.1** The implementation of Medicaid managed care will increase access to care, the quality of care, and health outcomes.

Table 1.1: Measures related to Hypothesis 1.1, by Research Question

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| **Research question 1.1.a Does the implementation of standard plans increase access to health care for those in the target population?** | | | | | |
| **Getting Care Quickly** | NQF #: 0006 / AHRQ | Respondents who always received the desired care or service | Respondents to the CAHPS survey* | CAHPS Q4 & Q6 | Outcome |
| **Getting Needed Care** | NQF #: 0006 / AHRQ | Respondents who always desired care or service | Respondents to the CAHPS survey* | CAHPS Q9 & Q18 | Outcome |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| | | | | | |
| **Use of primary care services** | Quality Strategy Objective 2.3 | Coded as receiving primary care | In PHP population | Claims / Encounter data | Process |
| **Adolescent Well-Care** | NCQA – HEDIS 17168 | Received a well-child visit | Adolescents age 12-21 in PHP population | Claims / Encounter data | Process |
| **Children and Adolescents' Access to Primary Care Practitioners (4 measures)** | NQF#: 2371 / NCQA - HEDIS | Coded as receiving primary care | Children ages 12 months – 19 years in PHP population | Claims / Encounter data | Process |
| **(Any) Annual Dental Visits** | NQF#: 1388/ NCQA - HEDIS | Coded as receiving 1+ outpatient dental visit | Beneficiaries ages 2-20 years of age with dental coverage included in the PHP contract | Claims / Encounter data | Process |
| **Dental Sealants for Children at Elevated Caries Risk** | NQF#: 2508/ NCQA – HEDIS / ADA on Behalf of the Dental Quality Alliance | Coded as receiving dental sealants | Beneficiaries age 6-9 at Elevated Caries Risk in PHP population | Claims / Encounter data | Process |
| **Up to date on Childhood Immunizations** | NQF#: 0038 / NCQA - HEDIS | Received all immunizations suggested per age | Children who turned age 2 in PHP population | Claims / Encounter Data; Immunization Data | Process |
| **Immunizations for Adolescents (2 measures)** | NQF#: 1407 / NCQA - HEDIS | Adolescents age 13 who had specified vaccine by their 13th birthday | Medicaid enrolled adolescents in PHP population | Claims / Encounter Data; Immunization Data | Process |
| **Research question 1.1.b Does the implementation of standard plans improve the quality of health care received by the target population?** | | | | | |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| **Customer Service** | NQF #: 0006 / AHRQ | Respondents who always received the desired care or service | Respondents to the CAHPS survey* | CAHPS Q9 & Q18 | Outcome |
| **Rating of Health Plan** | NQF #: 0006 / AHRQ | Respondents who always received the desired care or service | Respondents to the CAHPS survey* | CAHPS Q26 | Outcome |
| **Rating of all Health Care** | NQF #: 0006 / AHRQ | Respondents who always received the desired care or service | Respondents to the CAHPS survey* | CAHPS Q8 | Outcome |
| **Rating of Personal Doctor** | NQF #: 0006 / AHRQ | Respondents who always received the desired care or service | Respondents to the CAHPS survey* | CAHPS Q16 | Outcome |
| **Adult BMI Assessment** | NQF#: 0023 / NCQA - HEDIS | Coded as having BMI assessment | Beneficiaries 18-74 with an outpatient visit in PHP population | Claims / Encounter Data; PHP data | Process |
| **Weight Assessment and Counseling for Nutrition and Physical Activity for Children/ Adolescents** | NQF#: 0024/ NCQA - HEDIS | Coded as having Weight Assessment and Counseling for Nutrition and Physical Activity | Beneficiaries 3-17 in PHP population who had an outpatient visit with a PCP or OB/GYN | Claims / Encounter Data; PHP data | Process |
| **Tobacco Use screening and follow-up** | NQF# 2600 | Coded as having received tobacco use screening | Adults age 18+ in target population | Claims / Encounter data | Process |
| **Breast Cancer Screening** | NQF#: 2372 / NCQA - HEDIS | Coded as receiving breast cancer screening | Women 50-74 years of age in PHP population | Claims / Encounter Data | Process |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| **Cervical Cancer Screening** | NQF#: 0032 / NCQA - HEDIS | Coded as receiving cervical cancer screening | Women 21-64 years of age in PHP population | Claims / Encounter Data | Process |
| **Flu vaccine for Adults age 18-64** | NQF#: 0039 / NCQA - HEDIS | Coded as receiving Medicaid-paid flu vaccine | Adults age 18-64 in PHP population | Claims / Encounter Data | Process |
| **Appropriate Testing (for strep) for Children with Pharyngitis** | NQF#: 0002 / NCQA - HEDIS | Coded as receiving a strep test | Children age 3-18 in PHP population diagnosed with pharyngitis and dispensed an antibiotic | Claims / Encounter Data | Process |
| **Appropriate Treatment for Children with Upper Respiratory Infection** | NQF#: 0069 / NCQA - HEDIS | Coded as receiving appropriate treatment | Children 3 months – 18 years in PHP population given a diagnosis of URI | Claims / Encounter Data | Process |
| **Medication Management for People with Asthma** | NQF#: 1799 / NCQA - HEDIS | Coded as receiving medication management | Beneficiaries age 5-64 in PHP population with persistent asthma | Claims / Encounter Data | Process |
| **Asthma Medication Ratio** | NQF#: 1800 / NCQA - HEDIS | Medication ratio >=50% | Beneficiaries age 5-64 in PHP population with persistent asthma | Claims / Encounter Data | Process |
| **Avoidance of Antibiotic Treatment in Adults with Acute** | NQF#: 0058 / NCQA - HEDIS | Coded as not receiving antibiotics | Adults age 18-64 in PHP population with a diagnosis of | Claims / Encounter Data | Process |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| **Bronchitis** | | | acute bronchitis | | |
| **Annual Monitoring for Patients on Persistent Medications** | NQF#: 2371 / NCQA - HEDIS | Coded as receiving 1+ monitoring visit each year | Beneficiaries age 18+ in PHP population who received at least 180 days of outpatient medication for selected conditions | Claims / Encounter Data | Process |
| **Pharmacotherapy Management of COPD Exacerbation (2 measures)** | NQF#: 2856 / NCQA - HEDIS | Coded as receiving pharmacotherapy management | Beneficiaries age 40+ in PHP population with an acute inpatient discharge or ED visit | Claims / Encounter Data | Process |
| **Statin Therapy for Patients with Diabetes (2 measures)** | NQF#: 0547 / NCQA - HEDIS | Coded as receiving statin therapy | Beneficiaries age 40-75 in PHP population with diabetes and without atherosclerotic cardiovascular disease | Claims / Encounter Data | Process |
| **Statin Therapy for Patients with Cardiovascular Disease (2 measures)** | NQF#: 0543 / NCQA - HEDIS | Coded as receiving statin therapy | Men age 21-75 and women age 40-75 in PHP population with atherosclerotic cardiovascular disease | Claims / Encounter Data | Process |
| **Visits in the First 15 Months of Life** | NQF#: 1392 / NCQA - HEDIS | Received well-child visits | Children at age 15 months | Claims / Encounter Data | Process |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| | | | in PHP population | | |
| **Well-Child Visits in the Third, Fourth, Fifth, and Sixth Years of Life+** | NQF#: 1516 / NCQA - HEDIS | Received well-child visits | Children age 3-6 in PHP population | Claims / Encounter Data | Process |
| **Concurrent Use of Prescription Opioids and Benzodiazepines** | PQA | Received concurrent prescriptions for opioids and benzodiazepines | Adults without a cancer diagnosis and not in hospice in PHP population with two or more prescriptions of opioids with a days supply of over 15 days | Claims / Encounter data | Process |
| **Use of Imaging Studies for Low Back Pain** | NQF#: 0052 / NCQA - HEDIS | Coded as receving 1+ imaging procedure | Beneficiaries with a diagnosis of low back pain in PHP population | Claims / Encounter data | Process |
| **Chlamydia Screening in Women** | NQF#: 0033 / NCQA - HEDIS | Coded as receiving chlamydia screening | Women 16-24 years of age in PHP population identified as sexually active | Claims / Encounter Data | Process |
| **Screening for pregnancy risk** | NC Administrative Measure | Coded as receiving screening for pregnancy risk | Women in PHP population with a viable pregnancy | Claims / Encounter data | Process |
| **Frequency of Prenatal Care (>=81% of expected** | NQF#: 1391 / NCQA - HEDIS | Coded as receiving >=81% of expected visits | Women in PHP population with births | Claims / Encounter data; Birth | Process |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| **visits)** | | | covered by Medicaid | Certificate Data | |
| **Prenatal and Postpartum Care+** | NQF#: 1517 / NCQA - HEDIS | Coded as receiving prenatal and postpartum visits | Women with live births | Claims / Encounter data; Birth Certificate Data | Process |
| **Pregnant smokers screened and treated for tobacco use** | NC Modified measure | Coded as screened and treated | Pregnant tobacco users in PHP population | Birth certificate / Claims / Encounter data | Process |
| **Research question 1.1.c Does the implementation of standard plans improve health outcomes for those in the target population?** | | | | | |
| **All-Cause Hospital Readmission** | NQF#: 1768 / NCQA - HEDIS | Readmission within 30 days of discharge | Inpatient hospital stays for beneficiaries age 18+ in PHP population | Claims / Encounter Data | Outcome |
| **30-day hospital readmission rate following hospitalization for SUD** | -- | Readmission within 30 days of discharge | Hospital stays in PHP population with a diagnosis of SUD (generally) or OUD (specifically) | Claims / Encounter data | Outcome |
| **Comprehensive Diabetes Care: HbA1c poor control (>9.0) +** | NQF#: 0059 / NCQA - HEDIS | Coded as having HbA1c poor control (>9.0)+ | Beneficiaries age 18-75 in PHP population with a diabetes diagnosis | Claims / Encounter Data; PHP data | Outcome |
| **Comprehensive Diabetes Care (9 measures)** | NQF#: 0061, 0575, 0055 / NCQA - HEDIS | Coded as receiving various measures of | Beneficiaries age 18-75 in PHP | Claims / Encounter | Outcome |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| | | comprehensive care | population with a diabetes diagnosis | Data ; PHP data | |
| **Diabetes Short-term Complication Admission Rate** | PQI-01, PDI-15 | Coded as having an admission for short-term complications | Beneficiaries in PHP population with a diabetes diagnosis | Claims / Encounter data | Outcome |
| **Controlling High Blood Pressure** | NQF#: 0018 / NCQA - HEDIS | Coded as having controlled BP | Beneficiaries age 18-85 in PHP population with a diagnosis of HTN | Claims / Encounter Data ; PHP data | Outcome |
| **COPD or Asthma in Older Adult Admissions** | PQI-05 | Discharges for asthma or COPD | Adult beneficiaries age 40+ in PHP population | Claims / Encounter data | Outcome |
| **Heart Failure Admissions** | PQI-08 | Discharges for heart failure | Adult beneficiaries in PHP population | Claims / Encounter data | Outcome |
| **Receipt of Preventative Dental Services** | NQF#: 1334 / CMS-416 | Receipt of a preventative dental service | Beneficiaries ages 1-20 in PHP population enrolled at least 90 days and eligible for EPSDT | Claims / Encounter data | Outcome |
| **Asthma Admissions in Younger Adults** | PQI-15 | Hospitalized for asthma | Young adult beneficiaries in PHP population | Claims / Encounter data | Outcome |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| **Gastroenteritis Admissions** | PDI-15 | Hospitalized for gastroenteritis | Children in PHP population | Claims / Encounter data | Outcome |
| **Urinary Tract Infection Admissions** | PDI-18 | Hospitalized for UTI | Children in PHP population | Claims / Encounter data | Outcome |
| **Death rate by group (e.g., SUD, SMI)** | -- | Died | Adult beneficiaries in PHP population; by key diagnostic group | Claims / Encounter data linked with death certificate data | Outcome |
| **Live Births Weighing Less than 2500 Grams +** | NQF#: 1382 / CDC (NC Modification) | Birthweight less than 2500 grams | Live births / live births covered by a PHP since 16 weeks | Birth Certificate / Medicaid eligibility | Outcome |
| **Infant Mortality** | | Infant death | Live births in PHP population | Birth Certificate / Death Certificate data | Outcome |
| **Healthy Days** | | Number of self-reported healthy days in month | Medicaid enrollees in PHP population and/or those Based on FPL | BRFSS | Outcome |
| **Tobacco Use Rate (multiple measures)** | Public Health Measures | Evidence of tobacco use | Medicaid enrollees in PHP population | BRFSS / CAHPS | Outcome |
| **Overweight / Obesity Rate** | -- | Coded as over weight / obese | Medicaid enrollees in PHP population and/or those Based on FPL | BRFSS / CAHPS | Outcome |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| **Death rate post prison release** | -- | Died | Adult beneficiaries in PHP population released from prison | Death Certificate data linked with DOC data and Medicaid enrollment, claims, and encounters | Outcome |
| **Research question 1.1.d Does the implementation of tailored plans increase access to health care for those in the target population?** | | | | | |
| **Getting Care Quickly** | NQF #: 0006 / AHRQ | Respondents who always received the desired care or service | Respondents to the CAHPS survey* | CAHPS Q4 & Q6 | Outcome |
| **Getting Needed Care** | NQF #: 0006 / AHRQ | Respondents who always desired care or service | Respondents to the CAHPS survey* | CAHPS Q9 & Q18 | Outcome |
| **Use of primary care services** | Quality Strategy Objective 2.3 | Coded as receiving primary care | Enrollees in TP population | Claims / Encounter data | Process |
| **Adolescent Well-Care** | NCQA – HEDIS 17168 | Received a well-child visit | Adolescents age 12-21 in TP population | Claims / Encounter data | Process |
| **Children and Adolescents' Access to Primary Care Practitioners (4 measures)** | NQF#: 2371 / NCQA - HEDIS | Coded as receiving primary care | Children ages 12 months – 19 years in TP population | Claims / Encounter data | Process |
| **(Any) Annual Dental Visits** | NQF#: 1388/ NCQA - HEDIS | Coded as receiving 1+ outpatient dental visit | Beneficiaries ages 2-20 years of age in TP population with dental coverage | Claims / Encounter data | Process |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| | | | included in the TP contract | | |
| **Dental Sealants for Children at Elevated Caries Risk** | NQF#: 2508/ NCQA – HEDIS / ADA on Behalf of the Dental Quality Alliance | Coded as receiving dental sealants | Beneficiaries age 6-9 in TP population at elevated caries risk | Claims / Encounter data | Process |
| **Up to date on Childhood Immunizations** | NQF#: 0038 / NCQA - HEDIS | Received all immunizations suggested per age | Children who turned age 2 in TP population | Claims / Encounter Data; Immunization Data | Process |
| **Immunizations for Adolescents (2 measures)** | NQF#: 1407 / NCQA - HEDIS | Adolescents age 13 who had specified vaccine by their 13th birthday | Medicaid enrolled adolescents in TP population | Claims / Encounter Data; Immunization Data | Process |
| **Research question 1.1.e Does the implementation of BH I/DD Tailored Plans improve the quality of health care received by the target population?** | | | | | |
| **Customer Service** | NQF #: 0006 / AHRQ | Respondents who always received the desired care or service | Respondents to the CAHPS survey* | CAHPS Q9 & Q18 | Outcome |
| **Rating of Health Plan** | NQF #: 0006 / AHRQ | Respondents who always received the desired care or service | Respondents to the CAHPS survey* | CAHPS Q26 | Outcome |
| **Rating of all Health Care** | NQF #: 0006 / AHRQ | Respondents who always received the desired care or service | Respondents to the CAHPS survey* | CAHPS Q8 | Outcome |
| **Rating of Personal Doctor** | NQF #: 0006 / AHRQ | Respondents who always received the desired care or service | Respondents to the CAHPS survey* | CAHPS Q16 | Outcome |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| **Adult BMI Assessment** | NQF#: 0023 / NCQA - HEDIS | Coded as having BMI assessment | Beneficiaries 18-74 with an outpatient visit in TP population | Claims / Encounter Data; PHP data | Process |
| **Weight Assessment and Counseling for Nutrition and Physical Activity for Children/ Adolescents** | NQF#: 0024/ NCQA - HEDIS | Coded as having Weight Assessment and Counseling for Nutrition and Physical Activity | Beneficiaries 3-17 in TP population who had an outpatient visit with a PCP or OB/GYN | Claims / Encounter Data; PHP data | Process |
| **Tobacco Use screening and follow-up** | NQF# 2600 | Coded as having received tobacco use screening | Adults age 18+ in target population | Claims / Encounter data | Process |
| **Breast Cancer Screening** | NQF#: 2372 / NCQA - HEDIS | Coded as receiving breast cancer screening | Women 50-74 years of age in TP population | Claims / Encounter Data | Process |
| **Cervical Cancer Screening** | NQF#: 0032 / NCQA - HEDIS | Coded as receiving cervical cancer screening | Women 21-64 years of age in TP population | Claims / Encounter Data | Process |
| **Flu vaccine for Adults age 18-64** | NQF#: 0039 / NCQA - HEDIS | Coded as receiving Medicaid-paid flu vaccine | Adults age 18-64 in TP population | Claims / Encounter Data | Process |
| **Appropriate Testing (for strep) for Children with Pharyngitis** | NQF#: 0002 / NCQA - HEDIS | Coded as receiving a strep test | Children age 3-18 in TP population diagnosed with pharyngitis and dispensed an antibiotic | Claims / Encounter Data | Process |
| **Appropriate Treatment for Children with Upper Respiratory Infection** | NQF#: 0069 / NCQA - HEDIS | Coded as receiving appropriate treatment | Children 3 months – 18 years in TP population given a | Claims / Encounter Data | Process |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| | | | diagnosis of URI | | |
| **Medication Management for People with Asthma** | NQF#: 1799 / NCQA - HEDIS | Coded as receiving medication management | Beneficiaries age 5-64 in TP population with persistent asthma | Claims / Encounter Data | Process |
| **Asthma Medication Ratio** | NQF#: 1800 / NCQA - HEDIS | Medication ratio >=50% | Beneficiaries age 5-64 in TP population with persistent asthma | Claims / Encounter Data | Process |
| **Avoidance of Antibiotic Treatment in Adults with Acute Bronchitis** | NQF#: 0058 / NCQA - HEDIS | Coded as not receiving antibiotics | Adults age 18-64 in TP population with a diagnosis of acute bronchitis | Claims / Encounter Data | Process |
| **Annual Monitoring for Patients on Persistent Medications** | NQF#: 2371 / NCQA - HEDIS | Coded as receiving 1+ monitoring visit each year | Beneficiaries age 18+ in TP population who received at least 180 days of outpatient medication for selected conditions | Claims / Encounter Data | Process |
| **Pharmacotherapy Management of COPD Exacerbation (2 measures)** | NQF#: 2856 / NCQA - HEDIS | Coded as receiving pharmacotherapy management | Beneficiaries age 40+ in TP population with an acute inpatient discharge or ED visit | Claims / Encounter Data | Process |
| **Statin Therapy for Patients with Diabetes (2 measures)** | NQF#: 0547 / NCQA - HEDIS | Coded as receiving statin therapy | Beneficiaries age 40-75 in TP population with diabetes | Claims / Encounter Data | Process |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| | | | and without atherosclerotic cardiovascular disease | | |
| **Statin Therapy for Patients with Cardiovascular Disease (2 measures)** | NQF#: 0543 / NCQA - HEDIS | Coded as receiving statin therapy | Men age 21-75 and women age 40-75 in TP population with atherosclerotic cardiovascular disease | Claims / Encounter Data | Process |
| **Well-Child Visits in the Third, Fourth, Fifth, and Sixth Years of Life+** | NQF#: 1516 / NCQA - HEDIS | Received well-child visits | Children age 3-6 in PHP population | Claims / Encounter Data | Process |
| **Concurrent Use of Prescription Opioids and Benzodiazepines** | PQA | Received concurrent prescriptions for opioids and benzodiazepines | Adults without a cancer diagnosis and not in hospice in TP population with two or more prescriptions of opioids with a days supply of over 15 days | Claims / Encounter data | Process |
| **Use of Imaging Studies for Low Back Pain** | NQF#: 0052 / NCQA - HEDIS | Coded as receving 1+ imaging procedure | Beneficiaries with a diagnosis of low back pain in TP population | Claims / Encounter data | Process |
| **Chlamydia Screening in Women** | NQF#: 0033 / NCQA - HEDIS | Coded as receiving chlamydia screening | Women 16-24 years of age in TP population | Claims / Encounter Data | Process |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| | | | identified as sexually active | | |
| **Screening for pregnancy risk** | NC Administrative Measure | Coded as receiving screening for pregnancy risk | Women in TP population with a viable pregnancy | Claims / Encounter data | Process |
| **Frequency of Prenatal Care (>=81% of expected visits)** | NQF#: 1391 / NCQA - HEDIS | Coded as receiving >=81% of expected visits | Women in TP population with births covered by Medicaid | Claims / Encounter data; Birth Certificate Data | Process |
| **Prenatal and Postpartum Care+** | NQF#: 1517 / NCQA - HEDIS | Coded as receiving prenatal and postpartum visits | Women with live births | Claims / Encounter data; Birth Certificate Data | Process |
| **Pregnant smokers screened and treated for tobacco use** | NC Modified measure | Coded as screened and treated | Pregnant tobacco users in TP population | Birth certificate / Claims / Encounter data | Process |
| **Research question 1.1.f Does the implementation of BH I/DD Tailored Plans improve health outcomes for those in the target population?** | | | | | |
| **All-Cause Hospital Readmission** | NQF#: 1768 / NCQA - HEDIS | Readmission within 30 days of discharge | Inpatient hospital stays for beneficiaries age 18+ in TP population | Claims / Encounter Data | Outcome |
| **30-day hospital readmission rate following hospitalization for SUD** | -- | Readmission within 30 days of discharge | Hospital stays in TP population with a diagnosis of SUD (generally) or OUD (specifically) | Claims / Encounter data | Outcome |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| **Comprehensive Diabetes Care: HbA1c poor control (>9.0) +** | NQF#: 0059 / NCQA - HEDIS | Coded as having HbA1c poor control (>9.0)+ | Beneficiaries age 18-75 in TP population with a diabetes diagnosis | Claims / Encounter Data; PHP data | Outcome |
| **Comprehensive Diabetes Care (9 measures)** | NQF#: 0061, 0575, 0055 / NCQA - HEDIS | Coded as receiving various measures of comprehensive care | Beneficiaries age 18-75 in TP population with a diabetes diagnosis | Claims / Encounter Data ; PHP data | Outcome |
| **Diabetes Short-term Complication Admission Rate** | PQI-01, PDI-15 | Coded as having an admission for short-term complications | Beneficiaries in TP population with a diabetes diagnosis | Claims / Encounter data | Outcome |
| **Controlling High Blood Pressure** | NQF#: 0018 / NCQA - HEDIS | Coded as having controlled BP | Beneficiaries age 18-85 in TP population with a diagnosis of HTN | Claims / Encounter Data ; PHP data | Outcome |
| **COPD or Asthma in Older Adult Admissions** | PQI-05 | Discharges for asthma or COPD | Adult beneficiaries in TP population | Claims / Encounter data | Outcome |
| **Heart Failure Admissions** | PQI-08 | Discharges for heart failure | Adult beneficiaries in TP population | Claims / Encounter data | Outcome |
| **Receipt of Preventative Dental Services** | NQF#: 1334 / CMS-416 | Receipt of a preventative dental service | Beneficiaries ages 1-20 in TP population enrolled at least 90 days | Claims / Encounter data | Outcome |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| | | | and eligible for EPSDT | | |
| **Asthma Admissions in Younger Adults** | PQI-15 | Hospitalized for asthma | Young adult beneficiaries in TP population | Claims / Encounter data | Outcome |
| **Gastroenteritis Admissions** | PDI-15 | Hospitalized for gastroenteritis | Children in TP population | Claims / Encounter data | Outcome |
| **Urinary Tract Infection Admissions** | PDI-18 | Hospitalized for UTI | Children in TP population | Claims / Encounter data | Outcome |
| **Death rate by group (e.g., SUD, SMI)** | -- | Died | Adult beneficiaries in TP population; by key diagnostic group | Claims / Encounter data linked with death certificate data | Outcome |
| **Live Births Weighing Less than 2500 Grams +** | NQF#: 1382 / CDC (NC Modification) | Birthweight less than 2500 grams | Live births / live births covered by a TP since 16 weeks | Birth Certificate / Medicaid eligibility | Outcome |
| **Infant Mortality** | | Infant death | Live births in TP population | Birth Certificate / Death Certificate data | Outcome |
| **Healthy Days** | | Number of self-reported healthy days in month | Medicaid enrollees in TP population and/or those Based on FPL | BRFSS | Outcome |
| **Tobacco Use Rate (multiple measures)** | Public Health Measures | Evidence of tobacco use | Medicaid enrollees in TP population | BRFSS / CAHPS | Outcome |
| **Overweight / Obesity Rate** | -- | Coded as over weight / obese | Medicaid enrollees in TP population and/or those | BRFSS / CAHPS | Outcome |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| | | | Based on FPL | | |
| **Death rate post prison release** | -- | Died | Adult beneficiaries in TP population released from prison | Death Certificate data linked with DOC data and Medicaid enrollment, claims, and encounters | Outcome |
| **Research question 1.1.g Does the implementation of specialized foster care plans increase access to health care for those in the target population?** | | | | | |
| **Getting Care Quickly** | NQF #: 0006 / AHRQ | Respondents who always received the desired care or service | Respondents to the CAHPS survey* | CAHPS Q4 & Q6 | Outcome |
| **Getting Needed Care** | NQF #: 0006 / AHRQ | Respondents who always desired care or service | Respondents to the CAHPS survey* | CAHPS Q9 & Q18 | Outcome |
| **Use of primary care services** | Quality Strategy Objective 2.3 | Coded as receiving primary care | In SP population | Claims / Encounter data | Process |
| **Adolescent Well-Care** | NCQA – HEDIS 17168 | Received a well-child visit | Adolescents age 12-21 in SP population | Claims / Encounter data | Process |
| **Children and Adolescents' Access to Primary Care Practitioners (4 measures)** | NQF#: 2371 / NCQA - HEDIS | Coded as receiving primary care | Children ages 12 months – 19 years in SP population | Claims / Encounter data | Process |
| **(Any) Annual Dental Visits** | NQF#: 1388/ NCQA - HEDIS | Coded as receiving 1+ outpatient dental visit | Beneficiaries ages 2-20 years of age with dental coverage | Claims / Encounter data | Process |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| | | | included in the SP contract | | |
| **Dental Sealants for Children at Elevated Caries Risk** | NQF#: 2508/ NCQA – HEDIS / ADA on Behalf of the Dental Quality Alliance | Coded as receiving dental sealants | Beneficiaries age 6-9 at Elevated Caries Risk in SP population | Claims / Encounter data | Process |
| **Up to date on Childhood Immunizations** | NQF#: 0038 / NCQA - HEDIS | Received all immunizations suggested per age | Children who turned age 2 in SP population | Claims / Encounter Data; Immunization Data | Process |
| **Immunizations for Adolescents (2 measures)** | NQF#: 1407 / NCQA - HEDIS | Adolescents age 13 who had specified vaccine by their 13th birthday | Medicaid enrolled adolescents in SP population | Claims / Encounter Data; Immunization Data | Process |
| **Research question 1.1.h Does the implementation of specialized foster care plans improve the quality of health care received by the target population?** | | | | | |
| **Customer Service** | NQF #: 0006 / AHRQ | Respondents who always received the desired care or service | Respondents to the CAHPS survey* | CAHPS Q9 & Q18 | Outcome |
| **Rating of Health Plan** | NQF #: 0006 / AHRQ | Respondents who always received the desired care or service | Respondents to the CAHPS survey* | CAHPS Q26 | Outcome |
| **Rating of all Health Care** | NQF #: 0006 / AHRQ | Respondents who always received the desired care or service | Respondents to the CAHPS survey* | CAHPS Q8 | Outcome |
| **Rating of Personal Doctor** | NQF #: 0006 / AHRQ | Respondents who always received the desired care or service | Respondents to the CAHPS survey* | CAHPS Q16 | Outcome |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| **Adult BMI Assessment** | NQF#: 0023 / NCQA - HEDIS | Coded as having BMI assessment | Beneficiaries 18+ with an outpatient visit in SP population | Claims / Encounter Data; PHP data | Process |
| **Weight Assessment and Counseling for Nutrition and Physical Activity for Children/ Adolescents** | NQF#: 0024/ NCQA - HEDIS | Coded as having Weight Assessment and Counseling for Nutrition and Physical Activity | Beneficiaries 3-17 in SP population who had an outpatient visit with a PCP or OB/GYN | Claims / Encounter Data; PHP data | Process |
| **Tobacco Use screening and follow-up** | NQF# 2600 | Coded as having received tobacco use screening | Adults age 18+ in target population | Claims / Encounter data | Process |
| **Breast Cancer Screening** | NQF#: 2372 / NCQA - HEDIS | Coded as receiving breast cancer screening | Women 50-74 years of age in PHP population | Claims / Encounter Data | Process |
| **Cervical Cancer Screening** | NQF#: 0032 / NCQA - HEDIS | Coded as receiving cervical cancer screening | Women 21-64 years of age in PHP population | Claims / Encounter Data | Process |
| **Flu vaccine for Adults age 18-64** | NQF#: 0039 / NCQA - HEDIS | Coded as receiving Medicaid-paid flu vaccine | Adults age 18-64 in PHP population | Claims / Encounter Data | Process |
| **Appropriate Testing (for strep) for Children with Pharyngitis** | NQF#: 0002 / NCQA - HEDIS | Coded as receiving a strep test | Children age 3-18 in PHP population diagnosed with pharyngitis and dispensed an antibiotic | Claims / Encounter Data | Process |
| **Appropriate Treatment for Children with Upper** | NQF#: 0069 / NCQA - HEDIS | Coded as receiving appropriate treatment | Children 3 months – 18 years in PHP population | Claims / Encounter Data | Process |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| **Respiratory Infection** | | | given a diagnosis of URI | | |
| **Medication Management for People with Asthma** | NQF#: 1799 / NCQA - HEDIS | Coded as receiving medication management | Beneficiaries age 5-64 in PHP population with persistent asthma | Claims / Encounter Data | Process |
| **Asthma Medication Ratio** | NQF#: 1800 / NCQA - HEDIS | Medication ratio >=50% | Beneficiaries age 5-64 in PHP population with persistent asthma | Claims / Encounter Data | Process |
| **Avoidance of Antibiotic Treatment in Adults with Acute Bronchitis** | NQF#: 0058 / NCQA - HEDIS | Coded as not receiving antibiotics | Adults age 18-64 in SP population with a diagnosis of acute bronchitis | Claims / Encounter Data | Process |
| **Annual Monitoring for Patients on Persistent Medications** | NQF#: 2371 / NCQA - HEDIS | Coded as receiving 1+ monitoring visit each year | Beneficiaries age 18+ in SP population who received at least 180 days of outpatient medication for selected conditions | Claims / Encounter Data | Process |
| **Visits in the First 15 Months of Life** | NQF#: 1392 / NCQA - HEDIS | Received well-child visits | Children at age 15 months in SP population | Claims / Encounter Data | Process |
| **Well-Child Visits in the Third, Fourth,** | NQF#: 1516 / NCQA - HEDIS | Received well-child visits | Children age 3-6 in SP population | Claims / Encounter Data | Process |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| **Fifth, and Sixth Years of Life+** | | | | | |
| **Concurrent Use of Prescription Opioids and Benzodiazepines** | PQA | Received concurrent prescriptions for opioids and benzodiazepines | Adults without a cancer diagnosis and not in hospice in SP population with two or more prescriptions of opioids with a days supply of over 15 days | Claims / Encounter data | Process |
| **Use of Imaging Studies for Low Back Pain** | NQF#: 0052 / NCQA - HEDIS | Coded as receving 1+ imaging procedure | Beneficiaries with a diagnosis of low back pain in SP population | Claims / Encounter data | Process |
| **Chlamydia Screening in Women** | NQF#: 0033 / NCQA - HEDIS | Coded as receiving chlamydia screening | Women 16-24 years of age in SP population identified as sexually active | Claims / Encounter Data | Process |
| **Screening for pregnancy risk** | NC Administrative Measure | Coded as receiving screening for pregnancy risk | Women in SP population with a viable pregnancy | Claims / Encounter data | Process |
| **Frequency of Prenatal Care (>=81% of expected visits)** | NQF#: 1391 / NCQA - HEDIS | Coded as receiving >=81% of expected visits | Women in SP population with births covered by Medicaid | Claims / Encounter data; Birth Certificate Data | Process |
| **Prenatal and Postpartum Care+** | NQF#: 1517 / NCQA - HEDIS | Coded as receiving prenatal and postpartum visits | Women with live births | Claims / Encounter data; Birth Certificate Data | Process |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| **Pregnant smokers screened and treated for tobacco use** | NC Modified measure | Coded as screened and treated | Pregnant tobacco users in PHP population | Birth certificate / Claims / Encounter data | Process |
| **Research question 1.1.i Does the implementation of specialized foster care plans improve health outcomes for those in the target population?** | | | | | |
| **All-Cause Hospital Readmission** | NQF#: 1768 / NCQA - HEDIS | Readmission within 30 days of discharge | Inpatient hospital stays for beneficiaries age 18+ in SP population | Claims / Encounter Data | Outcome |
| **30-day hospital readmission rate following hospitalization for SUD** | -- | Readmission within 30 days of discharge | Hospital stays in SP population with a diagnosis of SUD (generally) or OUD (specifically) | Claims / Encounter data | Outcome |
| **Comprehensive Diabetes Care: HbA1c poor control (>9.0) +** | NQF#: 0059 / NCQA - HEDIS | Coded as having HbA1c poor control (>9.0)+ | Beneficiaries age 18-75 in SP population with a diabetes diagnosis | Claims / Encounter Data; PHP data | Outcome |
| **Comprehensive Diabetes Care (9 measures)** | NQF#: 0061, 0575, 0055 / NCQA - HEDIS | Coded as receiving various measures of comprehensive care | Beneficiaries age 18+ in SP population with a diabetes diagnosis | Claims / Encounter Data ; PHP data | Outcome |
| **Diabetes Short-term Complication Admission Rate** | PQI-01, PDI-15 | Coded as having an admission for short-term complications | Beneficiaries in SP population with a | Claims / Encounter data | Outcome |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| | | | diabetes diagnosis | | |
| **Controlling High Blood Pressure** | NQF#: 0018 / NCQA - HEDIS | Coded as having controlled BP | Beneficiaries age 18+ in SP population with a diagnosis of HTN | Claims / Encounter Data ; PHP data | Outcome |
| **COPD or Asthma in Older Adult Admissions** | PQI-05 | Discharges for asthma or COPD | Adult beneficiaries in SP population | Claims / Encounter data | Outcome |
| **Heart Failure Admissions** | PQI-08 | Discharges for heart failure | Adult beneficiaries in SP population | Claims / Encounter data | Outcome |
| **Receipt of Preventative Dental Services** | NQF#: 1334 / CMS-416 | Receipt of a preventative dental service | Beneficiaries ages 1-20 in SP population enrolled at least 90 days and eligible for EPSDT | Claims / Encounter data | Outcome |
| **Asthma Admissions in Younger Adults** | PQI-15 | Hospitalized for asthma | Young adult beneficiaries in SP population | Claims / Encounter data | Outcome |
| **Gastroenteritis Admissions** | PDI-15 | Hospitalized for gastroenteritis | Children in SP population | Claims / Encounter data | Outcome |
| **Urinary Tract Infection Admissions** | PDI-18 | Hospitalized for UTI | Children in SP population | Claims / Encounter data | Outcome |
| **Death rate by group (e.g., SUD, SMI)** | -- | Died | Adult beneficiaries in SP population; by | Claims / Encounter data linked with death | Outcome |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| | | | key diagnostic group | certificate data | |
| **Live Births Weighing Less than 2500 Grams +** | NQF#: 1382 / CDC (NC Modification) | Birthweight less than 2500 grams | Live births / live births covered by a SP since 16 weeks | Birth Certificate / Medicaid eligibility | Outcome |
| **Infant Mortality** | | Infant death | Live births in SP population | Birth Certificate / Death Certificate data | Outcome |
| **Death rate post prison release** | -- | Died | Adult beneficiaries in SP population released from prison | Death Certificate data linked with DOC data and Medicaid enrollment, claims, and encounters | Outcome |

* Claims / Encounter data refers to fee-for-service (FFS) claims data prior to Nov 1, 2021 as well as remaining populations or services subject to FFS payments after Nov 1, 2021; LME/MCO encounter data; PHP encounter data; and State Operated Facilities (IMD) utilization data. + priority measures are those measures which PHPs are required to monitor in the Quality Strategy and may be used for an annual disparity report and may be published annually on DHHS's website.

**Hypothesis 1.2**: The implementation of Medicaid managed care will increase the rate of use of behavioral health services at the appropriate level of care and improve the quality of behavioral health care received.

Table 1.2: Measures related to Hypothesis 1.2, by Research Question

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| **Research question 1.2.a Does the implementation of standard plans increase the rate of use of behavioral health services at the appropriate level of care for those in the target population?** | | | | | |
| **Antidepressant Medication Management (two measures)** | NQF#: 0105/ NCQA - HEDIS | Beneficiaries who remained on antidepressant treatment | Beneficiaries age 18 and older who filled at least one prescription for antidepressant medication | Claims / Encounter Data | Process |
| **Depression screening among those with SUD** | NQMC: 004006 | Evidence of depression screening | Beneficiaries with SUD | Claims / Encounter data | Process |
| **Follow-up After Hospitalization for Mental Illness or Alcohol / Other Drug Treatment+ (7/30 days)** | NQF#: 0576/ NCQA - HEDIS | Evidence of outpatient visit in the appropriate time frame | Beneficiaries age 6+ who were hospitalized for treatment of selected mental illnesses | Claims / Encounter data | Process |
| **Follow-up for Children Prescribed ADHD Medication (2 measures)** | NQF#: 0108/ NCQA - HEDIS | Evidence of outpatient visit in the appropriate time frame | Children newly prescribed ADHD medications | Claims / Encounter data | Process |
| **Initiation and Engagement of SUD Treatment+** | NQF#: 0004/ NCQA - HEDIS | Initiation of SUD treatment | Adolescent and adult beneficiaries with a new episode of SUD | Claims / Encounter data | Process |
| **Medical Assistance with Smoking and Tobacco Use Cessation** | NQF#: 0027/ NCQA - HEDIS | Evidence of receipt of advice or treatments to quit | Adults who are current tobacco users | Claims / Encounters; PHP data; CAHPS | Process |
| **Continuity of Pharmacotherapy with OUD** | NQF#: 3175 | MAT use of 180+ days | Those with a diagnosis of OUD and MAT | Claims / Encounter data | Process |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| **Concurrent Use of Prescription Opioids and Benzodiazepines** | PQA | Contemporaneous use of opioids and benzodiazepines | Adults without a cancer diagnosis and not in hospice with two or more prescriptions of opioids with a supply of over 15 days | Claims / Encounter data | Process |
| **ED visits for SUD-related diagnoses and specifically for OUD (2 measures)** | NQF: 2605 | Evidence of 1+ ED visits for SUD | Children age 12 and over and adults with SUD | Claims / Encounter data | Process |
| **IP visits for SUD and specifically for OUD** | -- | Evidence of 1+ IP visits for SUD | Children age 12 and over and adults with SUD | Claims / Encounter data | Process |
| **Research question 1.2.b Does the implementation of standard plans improve the quality of behavioral health care received for those in the target population?** | | | | | |
| **Antidepressant Medication Management (two measures)** | NQF#: 0105/ NCQA - HEDIS | Beneficiaries who remained on antidepressant treatment | Beneficiaries age 18 and older who filled at least one prescription for antidepressant medication | Claims / Encounter Data | Process |
| **Depression screening among those with SUD** | NQMC: 004006 | Evidence of depression screening | Beneficiaries with SUD | Claims / Encounter data | Process |
| **Follow-up After Hospitalization for Mental Illness or Alcohol / Other Drug Treatment+ (7/30 days)** | NQF#: 0576/ NCQA - HEDIS | Evidence of outpatient visit in the appropriate time frame | Beneficiaries age 6+ who were hospitalized for treatment of selected mental illnesses | Claims / Encounter data | Process |
| **Follow-up for Children Prescribed ADHD Medication (2 measures)** | NQF#: 0108/ NCQA - HEDIS | Evidence of outpatient visit in the appropriate time frame | Children newly prescribed ADHD medications | Claims / Encounter data | Process |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| **Medical Assistance with Smoking and Tobacco Use Cessation** | NQF#: 0027/ NCQA - HEDIS | Evidence of receipt of advice or treatments to quit | Adults who are current tobacco users | Claims / Encounters; PHP data; CAHPS | Process |
| **Continuity of Pharmacotherapy with OUD** | NQF#: 3175 | MAT use of 180+ days | Those with a diagnosis of OUD and MAT | Claims / Encounter data | Process |
| **Concurrent Use of Prescription Opioids and Benzodiazepines** | PQA | Contemporaneous use of opioids and benzodiazepines | Adults without a cancer diagnosis and not in hospice with two or more prescriptions of opioids with a supply of over 15 days | Claims / Encounter data | Process |
| **ED visits for SUD-related diagnoses and specifically for OUD (2 measures)** | NQF: 2605 | Evidence of 1+ ED visits for SUD | Children age 12 and over and adults with SUD | Claims / Encounter data | Process |
| **IP visits for SUD and specifically for OUD** | -- | Evidence of 1+ IP visits for SUD | Children age 12 and over and adults with SUD | Claims / Encounter data | Process |
| **Research question 1.2.c Does the implementation of BH I/DD Tailored Plans increase the rate of use of behavioral health services at the appropriate level of care for those in the target population?** | | | | | |
| **Adherence to Antipsychotic Medications for Individuals with Schizophrenia** | NQF# 1879 NCQA - HEDIS | PDC >=80% and at least two Rx claims | Adults with an administrative diagnosis of Schizophrenia; during time periods not hospitalized | Claims / Encounter data* | Process |
| **Antidepressant Medication Management (two measures)** | NQF#: 0105/ NCQA - HEDIS | Beneficiaries who remained on antidepressant treatment | Beneficiaries age 18 and older who filled at least one prescription for antidepressant medication | Claims / Encounter Data | Process |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| **Use of behavioral health care for people with SMI or SUD** | -- | Evidence of behavioral health care use | Children, Adults in target population | Claims / Encounter data | Process |
| **Depression screening among those with SUD** | NQMC: 004006 | Evidence of depression screening | Beneficiaries with SUD | Claims / Encounter data | Process |
| **Follow-up After Hospitalization for Mental Illness or Alcohol / Other Drug Treatment+ (7/30 days)** | NQF#: 0576/ NCQA - HEDIS | Evidence of outpatient visit in the appropriate time frame | Beneficiaries age 6+ who were hospitalized for treatment of selected mental illnesses | Claims / Encounter data | Process |
| **Follow-up for Children Prescribed ADHD Medication (2 measures)** | NQF#: 0108/ NCQA - HEDIS | Evidence of outpatient visit in the appropriate time frame | Children newly prescribed ADHD medications | Claims / Encounter data | Process |
| **Initiation and Engagement of SUD Treatment+** | NQF#: 0004/ NCQA - HEDIS | Initiation of SUD treatment | Adolescent and adult beneficiaries with a new episode of SUD | Claims / Encounter data | Process |
| **Medical Assistance with Smoking and Tobacco Use Cessation** | NQF#: 0027/ NCQA - HEDIS | Evidence of receipt of advice or treatments to quit | Adults who are current tobacco users | Claims / Encounters; PHP data; CAHPS | Process |
| **Continuity of Pharmacotherapy with OUD** | NQF#: 3175 | MAT use of 180+ days | Those with a diagnosis of OUD and MAT | Claims / Encounter data | Process |
| **Concurrent Use of Prescription Opioids and Benzodiazepines** | PQA | Contemporaneous use of opioids and benzodiazepines | Adults without a cancer diagnosis and not in hospice with two or more prescriptions of opioids with a | Claims / Encounter data | Process |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| | | | supply of over 15 days | | |
| **ED visits for SUD-related diagnoses and specifically for OUD (2 measures)** | NQF: 2605 | Evidence of 1+ ED visits for SUD | Children age 12 and over and adults with SUD | Claims / Encounter data | Process |
| **IP visits for SUD and specifically for OUD** | -- | Evidence of 1+ IP visits for SUD | Children age 12 and over and adults with SUD | Claims / Encounter data | Process |
| **Research question 1.2.d Does the implementation of BH I/DD Tailored Plans improve the quality of behavioral health care received for those in the target population?** | | | | | |
| **Adherence to Antipsychotic Medications for Individuals with Schizophrenia** | NQF# 1879 NCQA - HEDIS | PDC >=80% and at least two Rx claims | Adults with an administrative diagnosis of Schizophrenia; during time periods not hospitalized | Claims / Encounter data* | Process |
| **Antidepressant Medication Management (two measures)** | NQF#: 0105/ NCQA - HEDIS | Beneficiaries who remained on antidepressant treatment | Beneficiaries age 18 and older who filled at least one prescription for antidepressant medication | Claims / Encounter Data | Process |
| **Depression screening among those with SUD** | NQMC: 004006 | Evidence of depression screening | Beneficiaries with SUD | Claims / Encounter data | Process |
| **Follow-up After Hospitalization for Mental Illness or Alcohol / Other Drug Treatment+ (7/30 days)** | NQF#: 0576/ NCQA - HEDIS | Evidence of outpatient visit in the appropriate time frame | Beneficiaries age 6+ who were hospitalized for treatment of selected mental illnesses | Claims / Encounter data | Process |
| **Follow-up for Children Prescribed ADHD Medication (2 measures)** | NQF#: 0108/ NCQA - HEDIS | Evidence of outpatient visit in the appropriate time frame | Children newly prescribed ADHD medications | Claims / Encounter data | Process |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| **Medical Assistance with Smoking and Tobacco Use Cessation** | NQF#: 0027/ NCQA - HEDIS | Evidence of receipt of advice or treatments to quit | Adults who are current tobacco users | Claims / Encounters; PHP data; CAHPS | Process |
| **Continuity of Pharmacotherapy with OUD** | NQF#: 3175 | MAT use of 180+ days | Those with a diagnosis of OUD and MAT | Claims / Encounter data | Process |
| **Concurrent Use of Prescription Opioids and Benzodiazepines** | PQA | Contemporaneous use of opioids and benzodiazepines | Adults without a cancer diagnosis and not in hospice with two or more prescriptions of opioids with a supply of over 15 days | Claims / Encounter data | Process |
| **ED visits for SUD-related diagnoses and specifically for OUD (2 measures)** | NQF: 2605 | Evidence of 1+ ED visits for SUD | Children age 12 and over and adults with SUD | Claims / Encounter data | Process |
| **IP visits for SUD and specifically for OUD** | -- | Evidence of 1+ IP visits for SUD | Children age 12 and over and adults with SUD | Claims / Encounter data | Process |
| **Research question 1.2.e Does the implementation of specialized foster care plans increase the rate of use of behavioral health services at the appropriate level of care for those in the target population?** | | | | | |
| **Adherence to Antipsychotic Medications for Individuals with Schizophrenia** | NQF# 1879 NCQA - HEDIS | PDC >=80% and at least two Rx claims | Adults with an administrative diagnosis of Schizophrenia; during time periods not hospitalized | Claims / Encounter data* | Process |
| **Antidepressant Medication Management (two measures)** | NQF#: 0105/ NCQA - HEDIS | Beneficiaries who remained on antidepressant treatment | Beneficiaries age 18 and older who filled at least one prescription for antidepressant medication | Claims / Encounter Data | Process |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| **Use of behavioral health care for people with SMI or SUD** | -- | Evidence of behavioral health care use | Children, Adults in target population | Claims / Encounter data | Process |
| **Depression screening among those with SUD** | NQMC: 004006 | Evidence of depression screening | Beneficiaries with SUD | Claims / Encounter data | Process |
| **Follow-up After Hospitalization for Mental Illness or Alcohol / Other Drug Treatment+ (7/30 days)** | NQF#: 0576/ NCQA - HEDIS | Evidence of outpatient visit in the appropriate time frame | Beneficiaries age 6+ who were hospitalized for treatment of selected mental illnesses | Claims / Encounter data | Process |
| **Follow-up for Children Prescribed ADHD Medication (2 measures)** | NQF#: 0108/ NCQA - HEDIS | Evidence of outpatient visit in the appropriate time frame | Children newly prescribed ADHD medications | Claims / Encounter data | Process |
| **Initiation and Engagement of SUD Treatment+** | NQF#: 0004/ NCQA - HEDIS | Initiation of SUD treatment | Adolescent and adult beneficiaries with a new episode of SUD | Claims / Encounter data | Process |
| **Medical Assistance with Smoking and Tobacco Use Cessation** | NQF#: 0027/ NCQA - HEDIS | Evidence of receipt of advice or treatments to quit | Adults who are current tobacco users | Claims / Encounters; PHP data; CAHPS | Process |
| **Continuity of Pharmacotherapy with OUD** | NQF#: 3175 | MAT use of 180+ days | Those with a diagnosis of OUD and MAT | Claims / Encounter data | Process |
| **Concurrent Use of Prescription Opioids and Benzodiazepines** | PQA | Contemporaneous use of opioids and benzodiazepines | Adults without a cancer diagnosis and not in hospice with two or more prescriptions of opioids with a | Claims / Encounter data | Process |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| | | | supply of over 15 days | | |
| **ED visits for SUD-related diagnoses and specifically for OUD (2 measures)** | NQF: 2605 | Evidence of 1+ ED visits for SUD | Children age 12 and over and adults with SUD | Claims / Encounter data | Process |
| **IP visits for SUD and specifically for OUD** | -- | Evidence of 1+ IP visits for SUD | Children age 12 and over and adults with SUD | Claims / Encounter data | Process |
| **Research question 1.2.f Does the implementation of specialized foster care plans improve the quality of behavioral health care received for those in the target population?** | | | | | |
| **Adherence to Antipsychotic Medications for Individuals with Schizophrenia** | NQF# 1879 NCQA - HEDIS | PDC >=80% and at least two Rx claims | Adults with an administrative diagnosis of Schizophrenia; during time periods not hospitalized | Claims / Encounter data* | Process |
| **Antidepressant Medication Management (two measures)** | NQF#: 0105/ NCQA - HEDIS | Beneficiaries who remained on antidepressant treatment | Beneficiaries age 18 and older who filled at least one prescription for antidepressant medication | Claims / Encounter Data | Process |
| **Depression screening among those with SUD** | NQMC: 004006 | Evidence of depression screening | Beneficiaries with SUD | Claims / Encounter data | Process |
| **Follow-up After Hospitalization for Mental Illness or Alcohol / Other Drug Treatment+ (7/30 days)** | NQF#: 0576/ NCQA - HEDIS | Evidence of outpatient visit in the appropriate time frame | Beneficiaries age 6+ who were hospitalized for treatment of selected mental illnesses | Claims / Encounter data | Process |
| **Follow-up for Children Prescribed ADHD Medication (2 measures)** | NQF#: 0108/ NCQA - HEDIS | Evidence of outpatient visit in the appropriate time frame | Children newly prescribed ADHD medications | Claims / Encounter data | Process |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| **Medical Assistance with Smoking and Tobacco Use Cessation** | NQF#: 0027/ NCQA - HEDIS | Evidence of receipt of advice or treatments to quit | Adults who are current tobacco users | Claims / Encounters; PHP data; CAHPS | Process |
| **Continuity of Pharmacotherapy with OUD** | NQF#: 3175 | MAT use of 180+ days | Those with a diagnosis of OUD and MAT | Claims / Encounter data | Process |
| **Concurrent Use of Prescription Opioids and Benzodiazepines** | PQA | Contemporaneous use of opioids and benzodiazepines | Adults without a cancer diagnosis and not in hospice with two or more prescriptions of opioids with a supply of over 15 days | Claims / Encounter data | Process |
| **ED visits for SUD-related diagnoses and specifically for OUD (2 measures)** | NQF: 2605 | Evidence of 1+ ED visits for SUD | Children age 12 and over and adults with SUD | Claims / Encounter data | Process |
| **IP visits for SUD and specifically for OUD** | -- | Evidence of 1+ IP visits for SUD | Children age 12 and over and adults with SUD | Claims / Encounter data | Process |

* Claims / Encounter data refers to fee-for-service (FFS) claims data prior to Nov 1, 2021 as well as remaining populations or services subject to FFS payments after Nov 1, 2021; LME/MCO encounter data; PHP encounter data; and State Operated Facilities (IMD) utilization data. + priority measures are those measures which PHPs are required to monitor in the Quality Strategy and may be used for an annual disparity report and may be published annually on DHHS's website.

**Hypothesis 1.3**: The implementation of Medicaid managed care will increase the use of Medication-assisted treatment (MAT) and other opioid treatment services and decrease the long-term use of opioids.

Table 1.3: Measures related to Hypothesis 1.3, by Research Question

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| **Research question 1.3.a Does the implementation of standard plans increase the use of MAT for those in the target population?** | | | | | |
| **Use of pharmacotherapy for opioid use disorder (OUD)** | NQF 3400 | Use of MAT | Beneficiaries with OUD | Claims / Encounters | Outcome |
| **Number of providers with DEA DATA 2000 waivers** | -- | | NC licensed providers | NC Licensure data / DEA DATA 2000 waiver data | Process |
| **Number of providers with DEA DATA 2000 waivers who have written prescriptions for Medicaid enrollees for MAT** | -- | | NC licensed providers with DEA waivers | CSRS / Medicaid claims | Process |
| **Research question 1.3.b Does the implementation of standard plans increase the use of non-medication opioid treatment services for those in the target population?** | | | | | |
| **Percent of SUD diagnosed beneficiaries who receive an SUD treatment service** | -- | Evidence of psychosocial service for SUD | Adults with a current diagnosis of SUD | Claims / Encounters | Outcome |
| **Research question 1.3.c Does the implementation of standard plans decrease the probability of long-term use of opioids?** | | | | | |
| **Long-Term Use of Opioids** | | TBD | Beneficiaries with opioid use | Claims / Encounters | Outcome |
| **Use of Opioids at High Dosage in Persons without Cancer** | NQF#:2940/ PQA | Evidence of opioid use of greater than 120mg for 90 consecutive days or longer | Adults without Cancer, with two or more prescription claims for opioids filled on at least two separate days, for which the sum of the days | Claims / Encounter data | Outcome |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| | | | supply is greater than or equal to 15. | | |
| **Use of Opioids from Multiple Providers in Persons Without Cancer** | NQF#:2950/ PQA | Evidence of opioid prescription claims from 4 or more prescribers AND 4 or more pharmacies | Adults without Cancer, with two or more prescription claims for opioids filled on at least two separate days, for which the sum of the days supply is greater than or equal to 15. | Claims / Encounter data | Outcome |
| **Reduced incarceration for drug-related charges** | -- | | Adults with SUD | DOC data | Outcome |
| **Research question 1.3.d Does the implementation of BH I/DD Tailored Plans increase the use of MAT for those in the target population?** | | | | | |
| **Use of pharmacotherapy for opioid use disorder (OUD)** | NQF 3400 | Use of MAT | Beneficiaries with OUD | Claims / Encounters | Outcome |
| **Number of providers with DEA DATA 2000 waivers** | -- | | NC licensed providers | NC Licensure data / DEA DATA 2000 waiver data | Process |
| **Number of providers with DEA DATA 2000 waivers who have written prescriptions for Medicaid enrollees for MAT** | -- | | NC licensed providers with DEA waivers | CSRS / Medicaid claims | Process |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| **Research question 1.3.e Does the implementation of BH I/DD Tailored Plans increase the use of non-medication opioid treatment services for those in the target population?** | | | | | |
| **Percent of SUD diagnosed beneficiaries who receive an SUD treatment service** | -- | Evidence of psychosocial service for SUD | Adults with a current diagnosis of SUD | Claims / Encounters | Outcome |
| **Research question 1.3.f Does the implementation of BH I/DD Tailored Plans decrease the probability of long-term use of opioids?** | | | | | |
| **Long-Term Use of Opioids** | | TBD | Beneficiaries with opioid use | Claims / Encounters | Outcome |
| **Use of Opioids at High Dosage in Persons without Cancer** | NQF#:2940/ PQA | Evidence of opioid use of greater than 120mg for 90 consecutive days or longer | Adults without Cancer, with two or more prescription claims for opioids filled on at least two separate days, for which the sum of the days supply is greater than or equal to 15. | Claims / Encounter data | Outcome |
| **Use of Opioids from Multiple Providers in Persons Without Cancer** | NQF#:2950/ PQA | Evidence of opioid prescription claims from 4 or more prescribers AND 4 or more pharmacies | Adults without Cancer, with two or more prescription claims for opioids filled on at least two separate days, for which the sum of the days supply is greater than or equal to 15. | Claims / Encounter data | Outcome |
| **Reduced incarceration for** | -- | | Adults with SUD | DOC data | Outcome |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| **drug-related charges** | | | | | |
| **Research question 1.3.g Does the implementation of specialized foster care plans increase the use of MAT for those in the target population?** | | | | | |
| **Use of pharmacotherapy for opioid use disorder (OUD)** | NQF 3400 | Use of MAT | Beneficiaries with OUD | Claims / Encounters | Outcome |
| **Research question 1.3.h Does the implementation of specialized foster care plans increase the use of non-medication opioid treatment services for those in the target population?** | | | | | |
| **Percent of SUD diagnosed beneficiaries who receive an SUD treatment service** | -- | Evidence of psychosocial service for SUD | Adults with a current diagnosis of SUD | Claims / Encounters | Outcome |
| **Research question 1.3.i Does the implementation of specialized foster care plans decrease the probability of long-term use of opioids?** | | | | | |
| **Long-Term Use of Opioids** | | TBD | Beneficiaries with opioid use | Claims / Encounters | Outcome |
| **Use of Opioids at High Dosage in Persons without Cancer** | NQF#:2940/ PQA | Evidence of opioid use of greater than 120mg for 90 consecutive days or longer | Adults without Cancer, with two or more prescription claims for opioids filled on at least two separate days, for which the sum of the days supply is greater than or equal to 15. | Claims / Encounter data | Outcome |
| **Use of Opioids from Multiple Providers in Persons Without Cancer** | NQF#:2950/ PQA | Evidence of opioid prescription claims from 4 or more prescribers AND 4 or | Adults without Cancer, with two or more prescription claims for opioids filled on at least two separate days, | Claims / Encounter data | Outcome |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| | | more pharmacies | for which the sum of the days supply is greater than or equal to 15. | | |
| **Reduced incarceration for drug-related charges** | -- | | Adults with SUD | DOC data | Outcome |

* Claims / Encounter data refers to fee-for-service (FFS) claims data prior to Nov 1, 2021 as well as remaining populations or services subject to FFS payments after Nov 1, 2021; LME/MCO encounter data; PHP encounter data; and State Operated Facilities (IMD) utilization data. + priority measures are those measures which PHPs are required to monitor in the Quality Strategy and may be used for an annual disparity report and may be published annually on DHHS's website. CSRS refers to data from the Controlled Substances Reporting System.

**Hypothesis 1.4**: Implementation of Advanced Medical Homes will increase the delivery of care management services and will improve quality of care and health outcomes.

Table 1.4: Measures related to Hypothesis 1.4, by Research Question

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| **Research question 1.4.a Does the implementation of AMHs and HHs increase the probability of receiving care management services?** | | | | | |
| **Number / % of practices on the PHP panel that attest to being a level 3 AMH** | -- | AMH Tier 3 providers | Providers | PHP Network data | Process |
| **Number of enrollees attributed to an Advanced Medical Home** | Quality Strategy Objective 2.2 | Enrollees attributed to an AMH | All | Claims and Encounters | Process |
| **Number of** | -- | Evidence of care | All | Care management databases | Outcome |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| **enrollees receiving care management** | | management receipt | | | |
| **Research question 1.4.b Does the implementation of AMHs and HHs improve the quality of care received?** | | | | | |
| **Flu vaccine for Adults age 18-64** | NQF#: 0039 / NCQA - HEDIS | Coded as receiving Medicaid-paid flu vaccine | Adults age 18-64 in PHP population | Claims / Encounter Data | Process |
| **Medication Management for People with Asthma** | NQF#: 1799 / NCQA - HEDIS | Coded as receiving medication management | Beneficiaries age 5-64 in PHP population with persistent asthma | Claims / Encounter Data | Process |
| **Asthma Medication Ratio** | NQF#: 1800 / NCQA - HEDIS | Medication ratio >=50% | Beneficiaries age 5-64 in PHP population with persistent asthma | Claims / Encounter Data | Process |
| **Antidepressant Medication Management (two measures)** | NQF#: 0105/ NCQA - HEDIS | Beneficiaries who remained on antidepressant treatment | Beneficiaries age 18 and older who filled at least one prescription for antidepressant medication | Claims / Encounter Data | Process |
| **Medical Assistance with Smoking and Tobacco Use Cessation** | NQF#: 0027/ NCQA - HEDIS | Evidence of receipt of advice or treatments to quit | Adults who are current tobacco users | Claims / Encounters; PHP data; CAHPS | Process |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| **Follow-up After Hospitalization for Mental Illness or Alcohol / Other Drug Treatment+ (7/30 days)** | NQF#: 0576/ NCQA - HEDIS | Evidence of outpatient visit in the appropriate time frame | Beneficiaries age 6+ who were hospitalized for treatment of selected mental illnesses | Claims / Encounter data | Process |
| **Follow-up for Children Prescribed ADHD Medication (2 measures)** | NQF#: 0108/ NCQA - HEDIS | Evidence of outpatient visit in the appropriate time frame | Children newly prescribed ADHD medications | Claims / Encounter data | Process |
| **Well-Child Visits in the Third, Fourth, Fifth, and Sixth Years of Life+** | NQF#: 1516 / NCQA - HEDIS | Received well-child visits | Children age 3-6 in PHP population | Claims / Encounter Data | Process |
| **Up to date on Childhood Immunizations** | NQF#: 0038 / NCQA - HEDIS | Received all immunizations suggested per age | Children who turned age 2 year | Claims / Encounter Data; Immunization Data | Process |
| **Immunizations for Adolescents (2 measures)** | NQF#: 1407 / NCQA - HEDIS | Adolescents age 13 who had specified vaccine by their 13$^{th}$ birthday | Medicaid enrolled adolescents | Claims / Encounter Data; Immunization Data | Process |
| **Weight Assessment and Counseling for Nutrition and Physical Activity for Children/ Adolescents** | NQF#: 0024/ NCQA - HEDIS | Coded as having Weight Assessment and Counseling for Nutrition and Physical Activity | Beneficiaries 3-17 in PHP population who had an outpatient visit with a PCP or OB/GYN | Claims / Encounter Data; PHP data | Process |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| **Cervical Cancer Screening** | NQF#: 0032 / NCQA - HEDIS | Coded as receiving cervical cancer screening | Women 21-64 years of age in PHP population | Claims / Encounter Data | Process |
| **Comprehensive Diabetes Care: HbA1c poor control (>9.0) +** | NQF#: 0059 / NCQA - HEDIS | Coded as having HbA1c poor control (>9.0)+ | Beneficiaries age 18-75 in PHP population with a diabetes diagnosis | Claims / Encounter Data; PHP data | Outcome |
| **Research question 1.4.c Does the implementation of AMHs and HHs improve health outcomes?** | | | | | |
| **All-Cause Hospital Readmission** | NQF#: 1768 / NCQA - HEDIS | Readmission within 30 days of discharge | Inpatient hospital stays for beneficiaries age 18+ in PHP population | Claims / Encounter Data | Outcome |
| **Controlling High Blood Pressure** | NQF#: 0018 / NCQA - HEDIS | Coded as having controlled BP | Beneficiaries age 18-85 in PHP population with a diagnosis of HTN | Claims / Encounter Data ; PHP data | Outcome |
| **Diabetes Short-term Complication Admission Rate** | PQI-01, PDI-15 | Coded as having an admission for short-term complications | Beneficiaries in PHP population with a diabetes diagnosis | Claims / Encounter data | Outcome |
| **COPD or Asthma in Older Adult Admissions** | PQI-05 | Discharges for asthma or COPD | Adult beneficiaries age 40+ in PHP population | Claims / Encounter data | Outcome |
| **Heart Failure Admissions** | PQI-08 | Discharges for heart failure | Adult beneficiaries | Claims / Encounter data | Outcome |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| | | | in PHP population | | |
| **Asthma Admissions in Younger Adults** | PQI-15 | Hospitalized for asthma | Young adult beneficiaries in PHP population | Claims / Encounter data | Outcome |
| **Gastroenteritis Admissions** | PDI-15 | Hospitalized for gastroenteritis | Children in PHP population | Claims / Encounter data | Outcome |
| **Urinary Tract Infection Admissions** | PDI-18 | Hospitalized for UTI | Children in PHP population | Claims / Encounter data | Outcome |

**Hypothesis 1.5**: The implementation of Medicaid managed care will reduce disparities in the quality of care received.

Table 1.5: Measures related to Hypothesis 1.5, by Research Question

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| **Research question 1.5.a Does the implementation of standard plans increase equity in the quality of care for those in the target population?** | | | | | |
| **Appropriate Treatment for Children with Upper Respiratory Infection** | NQF#: 0069 / NCQA - HEDIS | Coded as receiving appropriate treatment | Children 3 months – 18 years in PHP population given a diagnosis of URI | Claims / Encounter Data | Process |
| **Dental Sealants for Children at Elevated Caries Risk** | NQF#: 2508/ NCQA – HEDIS / ADA on Behalf of the Dental Quality Alliance | Coded as receiving dental sealants | Beneficiaries age 6-9 at Elevated Caries Risk in PHP population | Claims / Encounter data | Process |
| **Flu vaccine for Adults age 18-64** | NQF#: 0039 / NCQA - HEDIS | Coded as receiving Medicaid-paid flu vaccine | Adults age 18-64 in PHP population | Claims / Encounter Data | Process |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| **Research question 1.5.b Does the implementation of BH I/DD Tailored Plans increase equity in the quality of care for those in the target population?** | | | | | |
| **Follow-up for Children Prescribed ADHD Medication (2 measures)** | NQF#: 0108/ NCQA - HEDIS | Evidence of outpatient visit in the appropriate time frame | Children newly prescribed ADHD medications | Claims / Encounter data | Process |
| **Initiation and Engagement of SUD Treatment+** | NQF#: 0004/ NCQA - HEDIS | Initiation of SUD treatment | Adolescent and adult beneficiaries with a new episode of SUD | Claims / Encounter data | Process |
| **Adherence to Antipsychotic Medications for Individuals with Schizophrenia** | NQF# 1879 NCQA - HEDIS | PDC >=80% and at least two Rx claims | Adults with an administrative diagnosis of Schizophrenia; during time periods not hospitalized | Claims / Encounter data* | Process |
| **Research question 1.5.c Does the implementation of specialized foster care plans increase equity in the quality of care for those in the target population?** | | | | | |
| **Follow-up for Children Prescribed ADHD Medication (2 measures)** | NQF#: 0108/ NCQA - HEDIS | Evidence of outpatient visit in the appropriate time frame | Children newly prescribed ADHD medications | Claims / Encounter data | Process |
| **Antidepressant Medication Management (two measures)** | NQF#: 0105/ NCQA - HEDIS | Beneficiaries who remained on antidepressant treatment | Beneficiaries age 18 and older who filled at least one prescription for antidepressant medication | Claims / Encounter Data | Process |

**Hypothesis 2.1**: The implementation of Medicaid managed care will decrease the use of emergency departments for non-urgent use and hospital admissions for ambulatory sensitive conditions.

Table 2.1: Measures related to Hypothesis 2.1, by Research Question

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| **Research question 2.1.a Does the implementation of standard plans decrease the use of emergency departments for non-urgent use?** | | | | | |
| **Number of ED visits** | NCQA - HEDIS | Use of ED visits | All | Claims / Encounters | Outcome |
| **Avoidable or preventable emergency department visits** | NYU / Billings algorithm | Evidence of an avoidable ED visit | All | Claims / Encounters | Outcome |
| **Research question 2.1.b Does the implementation of standard plans decrease the use of hospital admissions for ambulatory sensitive conditions?** | | | | | |
| **Number of hospital admissions** | -- | Hospital Admissions | All | Claims / Encounters | Outcome |
| **Number of hospital days** | -- | Hospital Days | All | Claims / Encounters | Outcome |
| **Hospital admissions for ambulatory sensitive conditions; avoidable or preventable inpatient hospitalizations** | AHRQ PQI and PDI | Evidence of ASHA | All | Claims / Encounters | Outcome |
| **Research question 2.1.c Does the implementation of BH I/DD Tailored Plans decrease the use of emergency departments for non-urgent use?** | | | | | |
| **Number of ED visits** | NCQA - HEDIS | Use of ED visits | All | Claims / Encounters | Outcome |
| **Avoidable or preventable emergency department visits** | NYU / Billings algorithm | Evidence of an avoidable ED visit | All | Claims / Encounters | Outcome |
| **Research question 2.1.d Does the implementation of BH I/DD Tailored Plans decrease the use of hospital admissions for ambulatory sensitive conditions?** | | | | | |
| **Number of hospital admissions** | -- | Hospital Admissions | All | Claims / Encounters | Outcome |
| **Number of hospital days** | -- | Hospital Days | All | Claims / Encounters | Outcome |
| **Hospital admissions for ambulatory sensitive conditions; avoidable or preventable inpatient hospitalizations** | AHRQ PQI and PDI | Evidence of ASHA | All | Claims / Encounters | Outcome |
| **Research question 2.1.e Does the implementation of specialized foster care plans decrease the use of emergency departments for non-urgent use?** | | | | | |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| **Number of ED visits** | NCQA - HEDIS | Use of ED visits | All | Claims / Encounters | Outcome |
| **Avoidable or preventable emergency department visits** | NYU / Billings algorithm | Evidence of an avoidable ED visit | All | Claims / Encounters | Outcome |
| **Research question 2.1.f Does the implementation of specialized foster care plans decrease the use of hospital admissions for ambulatory sensitive conditions?** | | | | | |
| **Number of hospital admissions** | -- | Hospital Admissions | All | Claims / Encounters | Outcome |
| **Number of hospital days** | -- | Hospital Days | All | Claims / Encounters | Outcome |
| **Hospital admissions for ambulatory sensitive conditions; avoidable or preventable inpatient hospitalizations** | AHRQ PQI and PDI | Evidence of ASHA | All | Claims / Encounters | Outcome |

**Hypothesis 2.2:** The implementation of Medicaid managed care will increase the number of enrollees receiving care management, overall and during transitions in care.
(Note that Hypothesis 1.4 focuses on the role AMHs specifically, whereas this Hypothesis focuses on access to care management generally and during transitions in care.)

Table 2.2: Measures related to Hypothesis 2.2, by Research Question

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| **Research question 2.2.a Does the implementation of standard plans increase the number of enrollees receiving care management?** | | | | | |
| **Coordination of Care (consumer perceptions)** | NQF #: 0006 | Respondents who always received the desired care or service | Respondents to the CAHPS survey* | CAHPS Q22&Q23 | Outcome |
| **Time to SDOH Screening from PHP attribution** | -- | Number of days from enrollment to SDOH screening | PHP enrollees | Claims / Encounter data ; PHP data; NCcare360 | Process |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| **Research question 2.2.b Does the implementation of standard plans increase the number of enrollees receiving care management during transitions in care?** | | | | | |
| **Enrollees Receiving Care Management during transitions in care** | -- | Evidence of care management | Beneficiaries discharges from a long hospital, rehab, or residential care | Claims / Encounter data; care management data systems | Process |
| **Medication Reconciliation Post-Discharge** | ACO-12 | Evidence of medication reconcillation | Beneficiaries discharges from a long hospital, rehab, or residential care | Claims / Encounter data | Process |
| **Research question 2.2.c Does the implementation of BH I/DD Tailored Plans increase the number of enrollees receiving care management?** | | | | | |
| **Coordination of Care (consumer perceptions)** | NQF #: 0006 | Respondents who always received the desired care or service | Respondents to the CAHPS survey* | CAHPS Q22&Q23 | Outcome |
| **Time to SDOH Screening from PHP attribution** | -- | Number of days from enrollment to SDOH screening | PHP enrollees | Claims / Encounter data ; PHP data; NCcare360 | Process |
| **Research question 2.2.d Does the implementation of BH I/DD Tailored Plans increase the number of enrollees receiving care management during transitions in care?** | | | | | |
| **Enrollees Receiving Care Management during transitions in care** | -- | Evidence of care management | Beneficiaries discharges from a long hospital, rehab, or residential care | Claims / Encounter data; care management data systems | Process |
| **Medication Reconciliation Post-Discharge** | ACO-12 | Evidence of medication reconcillation | Beneficiaries discharges from a long hospital, rehab, or residential care | Claims / Encounter data | Process |
| **Research question 2.2.e Does the implementation of specialized foster care plans increase the number of enrollees receiving care management?** | | | | | |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| **Coordination of Care (consumer perceptions)** | NQF #: 0006 | Respondents who always received the desired care or service | Respondents to the CAHPS survey* | CAHPS Q22&Q23 | Outcome |
| **Time to SDOH Screening from PHP attribution** | -- | Number of days from enrollment to SDOH screening | PHP enrollees | Claims / Encounter data ; PHP data; NCcare360 | Process |
| **Research question 2.2.f Does the implementation of specialized foster care plans increase the number of enrollees receiving care management during transitions in care?** | | | | | |
| **Enrollees Receiving Care Management during transitions in care** | -- | Evidence of care management | Beneficiaries discharges from a long hospital, rehab, or residential care | Claims / Encounter data; care management data systems | Process |
| **Medication Reconciliation Post-Discharge** | ACO-12 | Evidence of medication reconcillation | Beneficiaries discharges from a long hospital, rehab, or residential care | Claims / Encounter data | Process |

Note: A measure of care management use is under development and expected to be added as an additional metric for this outcome.

**Hypothesis 2.3**: The implementation of Medicaid managed care will reduce Medicaid program expenditures.

Table 2.3: Measures related to Hypothesis 2.3, by Research Question

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| **Research question 2.3.a Does the implementation of standard plans reduce Medicaid program expenditures?** | | | | | |
| **Total Expenditures to the Medicaid program and components** | -- | Total Medicaid expenditures | PHP enrollees | Claims / Encounter data | Outcome |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| **Out-of-pocket costs to Medicaid enrollees** | -- | OOP expenditures | PHP enrollees | Claims / Encounter data | Outcome |
| **Costs of Medicaid funded services and components** | -- | Value of Medicaid services, using FFS weights | PHP enrollees | Claims / Encounter data | Outcome |
| **Research question 2.3.b Does the implementation of BH I/DD Tailored Plans reduce Medicaid program expenditures?** | | | | | |
| **Total Expenditures to the Medicaid program and components** | -- | Total Medicaid expenditures | TP enrollees | Claims / Encounter data | Outcome |
| **Out-of-pocket costs to Medicaid enrollees** | -- | OOP expenditures | TP enrollees | Claims / Encounter data | Outcome |
| **Costs of Medicaid funded services and components** | -- | Value of Medicaid services, using FFS weights | TP enrollees | Claims / Encounter data | Outcome |
| **Research question 2.3.c Does the implementation of specialized foster care plans reduce Medicaid program expenditures?** | | | | | |
| **Total Expenditures to the Medicaid program and components** | -- | Total Medicaid expenditures | PHP enrollees | Claims / Encounter data | Outcome |
| **Out-of-pocket costs to Medicaid enrollees** | -- | OOP expenditures | PHP enrollees | Claims / Encounter data | Outcome |
| **Costs of Medicaid funded services and components** | -- | Value of Medicaid services, using FFS weights | PHP enrollees | Claims / Encounter data | Outcome |

**Hypothesis 2.4**: The implementation of standard and tailored plans will increase provider satisfaction and participation in the Medicaid program

Table 2.4: Measures related to Hypothesis 2.4, by Research Question

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| **Research question 2.4.a Does the implementation of standard plans increase provider satisfaction?** | | | | | |
| **Overall Provider Satisfaction** | UNC* | Measures of Satisfaction | Medicaid Providers | Provider Survey | Outcome |

| | | | | | |
|---|---|---|---|---|---|
| **Research question 2.4.b Does the implementation of standard plans increase provider participation in the Medicaid program?** | | | | | |
| **Provider participation in Medicaid (several measures, by quantity of participation, and by provider type)** | UNC* | Number of Medicaid enrollees | Medicaid Providers | Claims / Encounter | Outcome |
| **Research question 2.4.c Does the implementation of BH I/DD Tailored Plans increase provider satisfaction?** | | | | | |
| **Overall Provider Satisfaction** | UNC* | Measures of Satisfaction | Medicaid Providers | Provider Survey | Outcome |
| **Research question 2.4.d Does the implementation of BH I/DD Tailored Plans increase provider participation in the Medicaid program?** | | | | | |
| **Provider participation in Medicaid (several measures, by quantity of participation, and by provider type)** | UNC* | Number of Medicaid enrollees | Medicaid Providers | Claims / Encounter | Outcome |
| **Research question 2.4.e Does the implementation of specialized foster care plans increase provider satisfaction?** | | | | | |
| **Overall Provider Satisfaction** | UNC* | Measures of Satisfaction | Medicaid Providers | Provider Survey | Outcome |
| **Research question 2.4.f Does the implementation of specialized foster care plans increase provider participation in the Medicaid program?** | | | | | |
| **Provider participation in Medicaid (several measures, by quantity of participation, and by provider type)** | UNC* | Number of Medicaid enrollees | Medicaid Providers | Claims / Encounter | Outcome |

* Measures under development by Evaluation Team and/or other contractors

**Hypothesis 3.1**: Expanding coverage of SUD services to include residential services furnished in institutions for mental disease (IMD) as part of a comprehensive strategy will result in improved care quality and outcomes for patients with SUD.

Table 3.1: Measures related to Hypothesis 3.1, by Research Question

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| **Research question 3.1.a Does the expanded coverage of SUD services increase the quality of care for patients with SUD?** | | | | | |
| **Initiation and Engagement of SUD Treatment+** | NQF#: 0004/ NCQA - HEDIS | Initiation of SUD treatment | Adolescent and adult beneficiaries with a new episode of SUD | Claims / Encounter data | Process |
| **Continuity of Pharmacotherapy with OUD** | NQF#: 3175 | MAT use of 180+ days | Those with a diagnosis of OUD and MAT | Claims / Encounter data | Process |
| **Percent of diagnosed beneficiaries who receive a treatment service** | -- | Evidence of an SUD treatment service | Those with a current diagnosis of SUD | Claims / Encounter data | Process |
| **Concurrent Use of Prescription Opioids and Benzodiazepines** | PQA | Contemporaneous use of opioids and benzodiazepines | Adults without a cancer diagnosis and not in hospice with two or more prescriptions of opioids with a supply of over 15 days | Claims / Encounter data | Process |
| **Research question 3.1.b Does the expanded coverage of SUD services improve outcomes for people with SUD?** | | | | | |
| **Percent of SUD diagnosed beneficiaries who receive a SUD treatment service** | -- | Evidence of psychosocial service for SUD | Adults with a current diagnosis of SUD | Claims / Encounters | Outcome |
| **Death rate from overdose** | -- | | Adult beneficiaries with SUD diagnoses | Claims / Encounter data linked with death certificate data | Outcome |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| **Death rate from overdose post-release** | -- | | Adult beneficiaries released from prison | Death Certificate data linked with DOC data and Medicaid enrollment, claims, and encounters | Outcome |

**Hypothesis 3.2:** Expanding coverage of SUD services to include residential services furnished in IMDs as part of a comprehensive strategy for treating SUD will increase the use of MAT and other opioid treatment services and decrease the long-term use of opioids.

In contrast to Hypothesis 1.2, this hypothesis and Hypothesis 3.1 examine the use of SUD services and quality of care as a result of changes in the SUD delivery system rather than the implementation of managed care. This distinction will be further described in the Methods sections below.

Table 3.2: Measures related to Hypothesis 3.2, by Research Question

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| **Research question 3.2.a Does the expanded coverage of SUD services increase the use of MAT?** | | | | | |
| **Number of providers with DEA DATA 2000 waivers** | -- | | NC licensed providers | NC Licensure data / DEA DATA 2000 waiver data | Process |
| **Number of providers with DEA DATA 2000 waivers who have written prescriptions for Medicaid enrollees for MAT** | -- | | NC licensed providers with DEA waivers | CSRS / Medicaid claims | Process |
| **Percent of enrollees diagnosed with** | CMS | Receipt of MAT | Enrollees age 12 and above with OUD diagnosis | Claims / Encounter data | Process |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| **OUD receiving MAT** | | | and/or opioid poisoning code | | |
| **Research question 3.2.b Does the expanded coverage of SUD services increase the use of non-medication opioid treatment services at the appropriate level of care?** | | | | | |
| **Percent of enrollees diagnosed with OUD receiving non-medication opioid treatment services** | -- | Evidence of psychosocial service for OUD | Enrollees age 12 and above with OUD diagnosis and/or opioid poisoning code | Claims / Encounter data | Process |
| **ED visits for SUD-related diagnoses and specifically for OUD (2 measures)** | NQF: 2605 | Evidence of 1+ ED visits for SUD | Children age 12 and over and adults with SUD | Claims / Encounter data | Process |
| **IP visits for SUD and specifically for OUD** | -- | Evidence of 1+ IP visits for SUD | Children age 12 and over and adults with SUD | Claims / Encounter data | Process |
| **Research question 3.2.c Does the expanded coverage of SUD services decrease the probability of long-term use of opioids?** | | | | | |
| **Long-Term Use of Opioids** | | TBD | Beneficiaries with opioid use | Claims / Encounters | Outcome |
| **Use of Opioids at High Dosage in Persons without Cancer** | NQF#:2940/ PQA | Evidence of opioid use of greater than 120mg for 90 consecutive days or longer | Adults without Cancer, with two or more prescription claims for opioids filled on at least two separate days, for which the sum of the days supply is greater than or equal to 15. | Claims / Encounter data | Outcome |

**Hypothesis 3.3:** Expanding coverage of SUD services will result in no changes in total Medicaid costs for people with SUD diagnoses, increases in Medicaid costs on SUD IMD services, increases in SUD pharmacy, outpatient, and rehabilitative costs, and decreases in acute care crisis-oriented, inpatient, ED, long-term care and other SUD costs.

Table 3.3: Measures related to Hypothesis 3.3, by Research Question

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| **Research question 3.3a Does the expanded coverage of SUD services change total Medicaid costs?** | | | | | |
| **Total Expenditures to the Medicaid program** | -- | Total Medicaid expenditures | People with SUD diagnoses | Claims / Encounter data | Outcome |
| **Costs of Medicaid funded services** | -- | Value of Medicaid services, using FFS weights | People with SUD diagnoses | Claims / Encounter data | Outcome |
| **Research question 3.3b Does the expanded coverage of SUD services change out-of-pocket costs to Medicaid enrollees with an SUD diagnosis?** | | | | | |
| **Out-of-pocket costs to Medicaid enrollees** | -- | OOP expenditures | People with SUD diagnoses | Claims / Encounter data | Outcome |
| **Research question 3.3c Does the expanded coverage of SUD services increase Medicaid costs on SUD IMD services, SUD pharmacy, outpatient, and rehabilitative costs?** | | | | | |
| **Expenditures to the Medicaid program components** | -- | Total Medicaid expenditures | People with SUD diagnoses | Claims / Encounter data | Outcome |
| **Costs of Medicaid funded services components** | -- | Value of Medicaid services, using FFS weights | People with SUD diagnoses | Claims / Encounter data | Outcome |
| **Research question 3.3d Does the expanded coverage of SUD services decrease Medicaid costs on acute care crisis-oriented, inpatient, ED, long-term care and other SUD costs?** | | | | | |
| **Expenditures to the Medicaid program components** | -- | Total Medicaid expenditures | People with SUD diagnoses | Claims / Encounter data | Outcome |
| **Costs of Medicaid funded services components** | -- | Value of Medicaid services, using FFS weights | People with SUD diagnoses | Claims / Encounter data | Outcome |

| Measure | Measure custodian | Numerator | Denominator | Data Sources | Process / Outcome |
|---|---|---|---|---|---|
| **Research question 3.3e Does the expanded coverage of SUD services decrease Medicaid spending on non-SUD services for people with an SUD diagnosis?** | | | | | |
| **Expenditures to the Medicaid program components** | -- | Total Medicaid expenditures | People with SUD diagnoses | Claims / Encounter data | Outcome |
| **Costs of Medicaid funded services components** | -- | Value of Medicaid services, using FFS weights | People with SUD diagnoses | Claims / Encounter data | Outcome |

## C. Methodology

### 1. Evaluation Design

The evaluation will use a mixed-methods approach to testing the evaluation hypotheses. The quantitative analyses will use a difference-in-differences approach to the extent possible, as described below. This approach will be informed by the qualitative analyses by triangulating results from provider interviews and surveys and discussing preliminary results with providers and other stakeholders.

### 2. Qualitative Evaluation Plan

#### a. Purpose

The qualitative evaluation will examine perspectives from primary care and specialist providers including family medicine, internal medicine, pediatrics, and Ob/Gyn, behavioral health specialists, community based organizations (CBOs) (e.g., focusing on food and transportation accessibility), including those in Pilot networks, and in Pilot regions, as well as others, state health agency officials, and Prepaid Health Plans (PHPs) impacted by the NC Medicaid transformation. This examination will reveal detailed insights into the transformation that are not easily captured through claims and surveys; for example, how providers are preparing for the transformation and what can be done to improve their satisfaction with the Medicaid program. In addition to having standalone value, the qualitative evaluation, when combined with claims and survey analysis, enables a mixed methods evaluation design. A key strength of the mixed methods design is that it allows us to triangulate quantitative and qualitative approaches, thereby leveraging the strengths while minimizing the weaknesses of each. Quantitative approaches allow for establishing trends and levels of metrics and statistical significance of relationships between variables, whereas qualitative findings allow for in-depth exploration of how activities are performed and why relationships between variables exist.

Analyses of the qualitative data, along with particular stories contained in that data set, may provide additional hypotheses to test using the quantitative data sources and will be useful for developing explanations for the patterns we find in the quantitative analyses. Similarly, relationships observed among variables in the quantitative data analyses may be useful when inferring the extent to which findings from the qualitative analyses are likely to be generalizable.

In this evaluation, the qualitative analysis will enhance claims and survey analyses through collection of additional data from providers as well as data from stakeholders not reached directly by the survey or claims (e.g., health system administrators, support staff, patients). The qualitative evaluation serves both *exploratory* and *explanatory* purposes that will both inform and explain findings from the claims and survey analysis.

The *exploratory* purpose of the qualitative analysis will inform provider satisfaction surveys after waiver implementation has begun and potentially additional outcomes to examine in the claims analysis. For example, themes identified through semi-structured interviews with primary care providers about their satisfaction with the Medicaid program could inform development of survey items about the drivers of provider satisfaction, such as support received from plans, changes in reimbursement, and access to behavioral specialists (increased/decreased).

The *explanatory* purpose of the qualitative evaluation will build upon the initial and subsequent survey and claims analyses by generating explanations for these results that cannot be generated through quantitative analyses alone—typically because quantitative explanatory measures are not available or are insufficient to yield insights on key outcomes of interest. More specifically, the qualitative analysis will examine why hypotheses were or were not supported from quantitative analyses. For example, qualitative analyses will reveal insights into how "successful" providers and/or practices achieved their success. As another example, qualitative analyses could identify strategies for increasing provider satisfaction with Medicaid.

Specifically, the qualitative analysis will focus on exploratory and explanatory evaluation of the hypotheses listed in Table 4:

Table 4: Hypotheses Examined by Qualitative Evaluation

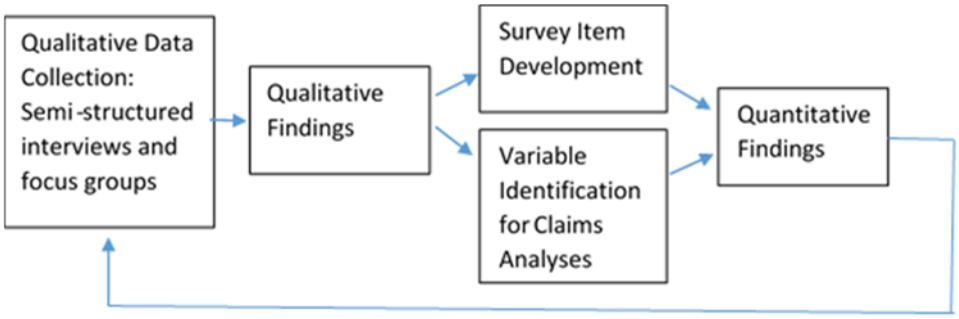
| | **Stakeholder Interviews** | | | | |
|---|---|---|---|---|---|
| **Hypotheses** | **Physician Practices** | **Behavioral Health** | **Community-based organizations** | **State Health Agencies** | **Prepaid Health Plans** |
| **H1.1**: *The implementation of Medicaid managed care will* | **X** | **X** | | | **X** |

| | | | | | |
|---|---|---|---|---|---|
| *increase access to care, the quality of care, and health outcomes.* | | | **X** | **X** | |
| **H1.2**: *The implementation of Medicaid managed care will increase the rate of use of behavioral health services at the appropriate level of care and improve the quality of behavioral health care received.* | **X** | **X** | **X** | **X** | **X** |
| **H1.4**: *Implementation of Advanced Medical Homes will increase the delivery of care management services and will improve quality of care and health outcomes.* | **X** | **X** | | **X** | |
| **H2.1***: The implementation of Medicaid managed care will decrease the use of emergency departments for non-urgent use and hospital admissions for ambulatory sensitive conditions.* | **X** | **X** | | **X** | **X** |
| **H2.2***: The implementation of Medicaid managed care will increase the number of enrollees receiving care management, overall and during transitions in care.* | **X** | **X** | | **X** | **X** |
| **H2.4**: *The implementation of Medicaid managed care will increase provider satisfaction and participation in the Medicaid program* | **X** | **X** | | **X** | |
| **H3.1***: Expanding coverage of SUD services to include residential services furnished in IMDs as part of a comprehensive strategy for treating SUD will result in* | | **X** | **X** | | **X** |

| | | | | | |
|---|---|---|---|---|---|
| *improved care quality and outcomes for patients with SUD.* | | | | | |
| **H3.2***: Expanding coverage of SUD services to include residential services furnished in IMDs as part of a comprehensive strategy for treating SUD will increase the use of MAT and other appropriate opioid treatment services and decrease the long-term use of prescription opioids.* | | **X** | **X** | | **X** |

Finally, the qualitative evaluation also will help ensure validity of conclusions through convergence or confirmation of quantitative results (Figure 1). Convergence in the results from the qualitative and quantitative analyses will provide stronger support for our findings, whereas any divergences in the results of the analyses will be useful for tempering interpretations of findings and guiding subsequent research efforts. For example, are quantitative measures of network adequacy and qualitative data on provider perceptions of network adequacy convergent or divergent? Convergence in the results will provide stronger support for the findings, whereas divergence in the results will inform interpretations of findings and suggest areas to examine in more depth in subsequent years of the evaluation.

Figure 1: Integration of Quantitative and Qualitative Methods




b. **Sample**

We will recruit a sample of provider practices to follow during the life of the evaluation. This approach will facilitate a detailed examination into whether/how external circumstances (e.g., support provided by the plans, patient needs, community resources) change over time as well as how providers adjust to the transformation during the early implementation phase and the longer term. Our sample will include approximately 36 physician practices from across the

state, with representation from each of the 6 regions (i.e., approximately 6 practices from each region). Within each region we plan to recruit family medicine, internal medicine, pediatrics, and Ob/Gyn practices. In addition, we will recruit behavioral health specialists and representatives from CBOs from each region that interviewees at the physician practices identify as resources for their Medicaid patients.

Because there is value in assessing perceptions and experiences over time, we plan to interview participants 2-3 times during the project period (e.g. providers every two years, state agencies and health plans every 2-3 years). On average, we will conduct approximately 50 individual interviews in each of the first 6 years of the project, for a total of approximately 314 interviews. The rationale for approximately 50 interviews is that we plan to interview 1 provider and 1 administrative/nursing staff member for each practice and approximately 1 behavioral health and/or CBO representative identified by each practice. We may find a need to interview more than 2 representatives of some practices (e.g., if the practice has many providers). Alternatively, we may not need to interview a behavioral health specialist or CBO representative identified by each practice because some practices may identify the same behavioral health specialists or CBOs as key resources for their patients.

In addition, we will adjust our provider sampling frame to reflect changes in the transformation plan. For example, we will ensure that there is provider representation from each of the tailored plan regions once that element of the transformation plan has been implemented. We will use a purposive sampling approach to account for contextual factors within each region of the state. For example, we may select more practices in some regions than others to account for factors that contribute to the complexity of caring for the Medicaid population (e.g., greater number of plans available) as well as practices that have partnered with CINs as well as those that have not.

In addition to physician practices, behavioral health services, and CBOs, we will conduct interviews with key informants from the state health agencies such as the Division of Health Benefits, the Division of Mental Health, and the Division of Public Health, and representatives from each of the 5 standard plans and from the tailored plans. We anticipate interviewing ~10 individual key informants from the state health agencies at two points during the evaluations—once during the first year of implementation and once approximately 2-3 years after implementation. Similarly, we will interview representatives from the heatlh plans. These interviews may be conducted with individual representatives or small groups (e.g., 2-4 PHP representatives), depending on the preference of the standard and tailored plans. Similar to the state agency interviews, representatives from each plan will be interviewed at two points during the evaluation—once during the first year of implementation and once approximately 2-3 years after implementation. Therefore, we estimate that we will conduct a total of approximately 20 interviews with SP and TP representatives.

**Table 5: Qualitative Evaluation Sample Sizes**

| Stakeholder | Interviews per Wave | Total Interviews | Incentives |
|---|---|---|---|
| **Prepaid Health Plans** | **~5 Interviews**<br>• Representative from each of 5 PHPs representing all 6 regions<br>• 2 waves of interviews | 10 | None |
| **Tailored Plans** | **~5 Interviews**<br>• Representative from each of the tailored plans<br>• Exact number to be determined based on rollout in 2021<br>• 2 waves of interviews | 10 | None |
| **State Health Agencies** | **~10 Interviews**<br>• Representatives from DHHS<br>• 2 waves of interviews | 20 | None |
| **Physician Practices** | **~72 Individuals (across 36 practices)**<br>• 1 Physician<br>• 1 Administrator (as appropriate)<br>• 3 waves of interviews | 216 | $100 per interview |
| **Behavioral Health Specialists** | **12-15 Individuals**<br>• 2-3 Behavioral health specialists from each region<br>• 3 waves of interviews | 40 | $100 per interview |
| **Community Based Organizations** | **10 Individuals**<br>• 1-2 Interviews per region<br>• 2 waves of interviews | 20 | $100 per interview |
| **Total Sample Size = ~ 314** | | | |

### c. Data Collection

We will conduct semi-structured interviews with representatives from practices, behavioral health specialists, CBOs, and PHPs. Individual interviews will be conducted either in person or via teleconference (e.g., Skype or Zoom). Depending on the practice's or key informant's availability, we will aim to conduct the first round of interviews in-person, in order to establish relationships and increase the likelihood of the practice's participation in future interviews. At least two researchers will attend each in-person interview. The role of the researchers will be to prompt for additional details and to take notes. Each interview will last approximately 45-60 minutes and will be digitally recorded and subsequently transcribed.

We will use an interview guide designed to capture information on such topics as practice-level readiness and capabilities for caring for Medicaid patients, support received from PHPs, and provider satisfaction with the Medicaid program and other key features of the demonstration

components such as the tailored plans and advanced medical homes. Table 6 illustrates potential interview domains that will be explored during interviews with providers and PHPs. Topics and interview questions will be developed and revised based on input from our advisory panel, preliminary findings from the provider satisfaction survey and claims analysis, and developments occurring in the NC Medicaid Transformation program (e.g. rollout of tailored plans in 2021).

Table 6: Example Topics ans Sample Interview Questions

| **Example Topics** | **Sample Interview Question** |
|---|---|
| | |
| Market Context | *Could you tell us about any major changes that have happened in this market in the last year?*<br>*How has the NC Medicaid Transformation affected your local market?* |
| Practice Readiness and Changes for Medicaid | *Is your practice doing anything differently to prepare for the new Medicaid model?*<br>*What changes in your practice structure, staffing and/or processes have been made since the new Medicaid model was implemented? If none, do you anticipate any changes in the future?* |
| Medicaid patient load | *What proportion of your practice are Medicaid patients?*<br>*How has the transformation changed the proportion of Medicaid patients in your practice?*<br>*Is your practice doing anything differently to meet the needs of this population?* |
| Advanced Medical Home & Care Coordination | *What are the core components of your Advanced Medical Home?*<br>*Does your practice have plan to increase AMH level?*<br>*Have there been any changes in the way that care coordination is being provided?* |
| Information and Support Received from PHP | *What kinds practice support is provided by the prepaid health plans? E.g., reports, quality or risk stratisfication data, incentives?* |
| Satisfaction with Administrative Process | *Have administrative or business office functions changed since the implementation? E.g. timeliness of payment, appropriateness of payment, ease of working with the PHPs?* |
| Physician Engagement | *How has the new NC Medicaid model changed your satisfaction or engagement with the Medicaid Program?* |
| Patient Needs | *In what ways do you think patients are impacted by Medicaid transformation?*<br>*Are there certain patient needs that are not being met?*<br>*Characteristics of patients who are not receiving care they need?*<br>*How has access to behavioral health changed?*<br>*How has access to support for health-related social needs?* |

| Example Topics | Sample Interview Question |
|---|---|
| Perceived Effectiveness of Medicaid Program | *How does the new Medicaid model compare to the previous models? (e.g., is care improving for patients? What changes are needed?)*<br>*If there was one thing you could change about the program, what would it be?* |
| Barriers & Facilitators | *What have been the biggest barriers or challenges facing your practice in the past year related to Medicaid?*<br>*What have you done to remove or address those barriers?*<br>*What factors have been the most helpful in improving your experience with Medicaid this year?* |

**d. Data Analysis**

Following standard qualitative coding techniques, we will code data segments within transcripts using labels that capture ideas contained in the data. Related codes will then be grouped into themes that highlight common perceptions, ideas, or experiences across informants. We will follow an iterative approach to analysis that involves ongoing cycles of reading and coding transcripts, reviewing the literature, and discussing findings among the research team to identify themes. Throughout the process we will use the constant comparative method comparing data with data, data with codes, codes with codes, and codes with themes, in order to construct a detailed framework of perceptions regarding the effectiveness of care coordination strategies. The research team will use a software package (e.g., NVivo version 12) to facilitate the managing and coding of qualitative data.

**3. Quantitative Evaluation Plan**

The quantitative evaluation plan will focus on the trends in and analysis of the measures outlined in Tables 1.1-3.2. We will use conduct analyses of metrics that are feasible on a monthly basis and reporting results to NC DHHS through a data dashboard to be developed as part of the Evaluation. This approach will allow for the best possible estimates in the shortest possible time, to provide feedback to DHHS and PHPs to allow for short-term quality improvements in plan delivery. We will make appropriate adjustments in the evaluation design if changes in the implementation occur (e.g., using additional time period indicators in the analyses; testing for structural breaks in the parameter estimates). The focus will be on causal modeling of each measure in an attempt to identify changes in the measure due to each aspect of the 1115 waiver. A variety of quantitative techniques will be used as described below.

### a. Difference-in-differences analysis

Through the use of a contemporaneous comparison group, described below, and pre-intervention data, many of the models estimated for the evaluation will follow a difference-in-differences approach.

Variables on expenditures and utilization derived from claims data will generally be updated monthly for analysis. Other variables that are from surveys or only available annually will be analyzed on an annual basis. Some metrics that are not relevant monthly, such as quality metrics with annual benchmarks (e.g., the % of eligible women receiving breast cancer screening), will be aggregated to annual measures and analyzed on a rolling basis as appropriate.

Analysis models will take the following form:

$$Y_{it} = f(\beta_0 + \beta_1 WaiverParticipant_{it} + \beta_2 Post_t + \beta_3 WaiverParticipant_{it} * Post_t + \beta_4 Z_{it} + \beta_5 Time_t) + \varepsilon_{it}$$

where *i* indexes individuals, *t* indexes time periods, Y are the process and outcome measures specified above, *WaiverParticipant* indicates individuals in the target population for each element of the waiver (e.g., those in the standard plans; those in the tailored plans), *Post* indicates the relevant post implementation period, *Z* are time-varying covariates, *Time* is a time period counter that starts from 1 during the first observation in the analysis period, and $\varepsilon$ is the model error term. We will examine both linear models with person-level fixed effects, our preferred specification to control for time-invariant selection differences between treatment and control groups, as well as Generalized Estimating Equation (GEE) models with appropriate distributional and correlation specifications for each outcome measure. Results from all analyses will be converted to average marginal effects, which specify the natural unit increase in the outcome measure due to the implementation of the waiver component (e.g., standard plans, tailored plans, SUD waiver provisions).

### b. Regression discontinuity models

PHPs, AMHs, and/or CINs are required to implement a risk stratification system in order to indentify Medicaid and Health Choice enrollees who might benefit from care management. If a single risk score were available across plans and a single threshold for the score were used to indentify candidates for care management, then a regression discontinuity design could be implemented for research questions 1.4 evaluating care management services by examining differences in outcomes for those just below and just above the assignment threshold. However, no single risk scoring tool has been required, which may mean that dozens of different risk scoring systems and thresholds of assignment may be in play. Information on exactly which risk scoring tool will be used by PHPs, AMHs, and CINs may not be available until implementation. We will seek to gather data on these tools from PHP reporting, through

contact with plan administrators, and from DHHS, and if a small number of risk scoring systems are in use on a sufficient number of PHP enrollees to justify the use of an RD design, we will use one to evaluate the effectiveness of care management systems, as described above.

### c. Interrupted time-series analysis models

Interrupted time-series (ITS) analysis models will take the following form:

$$Y_{it} = f(\beta_0 + \beta_1 Time_{it} + \beta_2 Post_t + \beta_3 Time_{it} * Post_t + \beta_4 Z_{it} +) + \varepsilon_{it}$$

This analysis is different from difference-in-differences analyses in two ways. First, it only includes intervention observations, from pre- and post- implementation, and thus a *Treatment* indicator is not necessary as it would always equal 1. Second, it specifically tests for changes in the slope of the time trends, in addition to an average shift in the level of the outcome for each measure. We will again generate average marginal effects of the interventions on the level of each outcome and on the trends in the outcomes, but will use GEE and related techniques for modeling outcomes. Because an ITS approach is subject to confounding from events such as the availability of treatments or changes in the health services environment that occur during the post-period, it is not our preferred approach to analysis. However, it may be used for quantitative analyses when a contemporaneous comparison group is not available, such as in analyses of the provider survey. At this writing the provider survey may not contain a pre-intervention assessment due to contract delays, in which case, we would use a modified ITS approach that would examine changes in provider satisfaction over time during the demonstration years and with respect to demonstration milestones.

### d. Costs of care

Research questions 2.3 and 3.3 examine the costs care. In a fee-for-service system, identifying costs to the Medicaid program is straightforward through the use of Medicaid expenditures. In capitated systems, there are several complications to this approach. PHPs are expected to continue to pay individual providers on a fee-for-service basis, but expenditure data is not always present in encounter data as it is often perceived as proprietary. This includes the baseline services funded through NC's currently behavioral health carve-out to regional entities, as well as the state-budged IMD services. In addition, the incentives to report accurate expenditure data may be dampened under capitation, although this can be mitigated through auditing or other forms of monitoring. Finally, the costing perspective may change under capitation, since the costs of an additional service to the Medicaid program are zero when the risk for service use is assumed by a PHP. In contrast, the societal cost of service use is non-zero, but should also include other costs not typically available in claims, such as time and transportation costs.

While the gold standard in cost analysis is to take a societal cost perspective, including not only the direct payments for services, but also unreimbursed costs of care as well as time and travel costs for patients, this approach is very resource intensive to do well and requires substantial

primary data collection. Relevant costs for most Medicaid policy analyses include costs to the Medicaid agency (including payments for services under fee-for-service as well as capitation payments), out-of-pocket costs to patients (co-payments), and costs to capitated health plans. We will examine costs from all three of these perspectives for the two cost hypotheses, as the data allows. That is, we will examine costs from the Medicaid agency perspective by aggregating fee-for-service payments for services outside the capitation system with capitation payments, but excluding the cost of services paid by PHPs. These costs are generally expected to decrease under capitation, but may increase with the expanded set of SUD benefits (Hypothesis 3.3). We will examine the out-of-pocket costs to Medicaid beneficiaries, as recorded in claims and encounters. These costs are hypothesized to remain constant. Finally, we will examine the costs of services provided under capitation, which is similar to a PHP perspective, had they been paying for services prior to PHP implementation. This perspective will use a fee-for-service costing approach to actual services use. If PHP expenditures are available in the encounter data, then we will use these expenditures directly, as the fee schedule for HCPCS coded services is not expected to change. If expenditures are not available from PHP encounter data, then we will append the pre-PHP fee-schedule to services delivered after PHP implementation.

Table 7: Summary Design Table for Quantitative Evaluation Metrics

| Abbreviated Research Question | Location of Outcome Measures | Comparison Group | Data Sources (Data source #s from Table 6) | Analytic Methods |
|---|---|---|---|---|
| **Hypothesis 1.1** | | | | |
| RQ1.1.a: Effect of standard plans on access to physical health care<br>RQ1.1.d: Effect of tailored/specialized plans on access to physical health care | Table 1.1 | None (Pre/Post) | -CAHPS (5), immunization registry data (11) | Interrupted time series |
| | | In/Out of State Controls | -Claims (1, 27), Encounters (2, 3) | Difference-in-Differences |
| RQ1.1.b: Effect of standard plans on the quality of care<br>RQ1.1.e: Effect of tailored/specialized plans on the quality of care | Table 1.1 | None (Pre/Post) | -CAHPS (5) | Interrupted time series |
| | | In/Out of State Controls | Claims (1, 27), Encounters (2, 3), PHP data (9), Birth Certificate | Difference-in-Differences |

| Abbreviated Research Question | Location of Outcome Measures | Comparison Group | Data Sources (Data source #s from Table 6) | Analytic Methods |
|---|---|---|---|---|
| | | | data (12), LHD data (25) | |
| RQ1.1.c: Effect of standard plans on outcomes<br>RQ1.1.f: Effect of tailored/specialized plans on outcomes | Table 1.1 | None (Pre/Post) | -CAHPS (5) | Interrupted time series |
| | | In/Out of State Controls | Claims (1, 27), Encounters (2, 3), PHP data (9), Birth Certificate data (12), Death Certficate data (13), BRFSS (14), DOC (19) | Difference-in-Differences |
| **Hypothesis 1.2** | | | | |
| RQ1.2.a: Effect of standard plans on appropriate use of behavioral health services<br>RQ1.2a: Effect of standard plans on quality of behavioral health services<br>RQ1.2c: Effect of tailored/specialized plans on appropriate use of behavioral health services<br>RQ1.2d: Effect of tailored/specialized plans on quality of behavioral health services | Table 1.2 | In/Out of State Controls | Claims (1, 27), Encounters (2, 3), PHP data (9), Clinical and diagnositic assessment data (10), NC TOPPS (20), NSDUH (23) | Difference-in-Differences |
| **Hypothesis 1.3** | | | | |

| Abbreviated Research Question | Location of Outcome Measures | Comparison Group | Data Sources (Data source #s from Table 6) | Analytic Methods |
|---|---|---|---|---|
| RQ1.3a: Effect of standard plans on Rx for OUD<br>RQ1.3b: Effect of standard plans on Services for OUD<br>RQ1.3c: Effect of standard plans on use of opioids<br>RQ1.3d: Effect of tailored/specialized plans on Rx for OUD<br>RQ1.3e: Effect of tailored/specialized plans on Services for OUD<br>RQ1.3f: Effect of tailored/specialized plans on use of opioids | Table 1.3 | In/Out of State Controls | -Claims (1, 27), Encounters (2, 3), DEA data (16), Licensure data (15), CSRS (17), DOC (19) | Difference-in-Differences |
| **Hypothesis 1.4** | | | | |
| RQ1.4a: Effect of AMH on receipt of care management<br>RQ1.4b Effect of AMH on quality<br>RQ1.4c Effect of AMH on outcomes | Table 1.4 | In/Out of State Controls; In-state controls will consist of PHP enrollees not in Tier 3 AMHs, if adequately powered. | -Claims (1, 27), Encounters (2, 3), PHP data (9), care management data (8), immunization registry data (11) | Difference-in-Differences |
| **Hypothesis 2.1** | | | | |
| RQ2.1.a: Effect of standard plans on non-urgent ED use<br>RA2.1.b Effect of standard plans on hospital admissions<br>RQ 2.1.c: Effect of tailored/specialized | Table 2.1 | In/Out of State Controls | -Claims (1, 27), Encounters (2, 3), PHP data (9), NC Hospital Discharge Data (21) | Difference-in-Differences |

| Abbreviated Research Question | Location of Outcome Measures | Comparison Group | Data Sources (Data source #s from Table 6) | Analytic Methods |
|---|---|---|---|---|
| plans on non-urgent ED use<br>RA2.1.d Effect of tailored/specialized plans on hospital admissions | | | | |
| **Hypothesis 2.2** | | | | |
| RQ2.2.a: Effect of standard plans on care management<br>RQ2.2.c: Effect of tailored/specialized plans on care management | Table 2.2<br>- consumer perceptions of care coordination | None (Pre/Post) | CAHPS (5) | Interrupted time series |
| RQ2.2.a: Effect of standard plans on care management<br>RQ2.2.c: Effect of tailored/specialized plans on care management | Table 2.2<br>- Time to SDOH Screening from PHP attribution | None | -NCcare360 (7) | Descriptive |
| RQ2.2.a: Effect of standard plans on care management<br>RQ2.2.b: Effect of standard plans on care management during transitions<br>RQ2.2.c: Effect of tailored/specialized plans on care management<br>RQ2.2.d: Effect of tailored/specialized plans on care management during transitions | Table 2.2 | In/Out of State Controls | -Claims (1), Encounters (2, 3), PHP data (9), NC Hospital Discharge Data (21) | Difference-in-Differences |
| **Hypothesis 2.3** | | | | |

| Abbreviated Research Question | Location of Outcome Measures | Comparison Group | Data Sources (Data source #s from Table 6) | Analytic Methods |
|---|---|---|---|---|
| RQ2.3.a Effect of standard plans on Medicaid expenditures<br>RQ2.3.b Effect of tailored/specialized plans on Medicaid expenditures | Table 2.3 | In/Out of State Controls | Claims (1, 27), Encounters (2, 3), MEPS (22) | Difference-in-Differences |
| **Hypothesis 2.4** | | | | |
| RQ2.4.a Effect of standard plans on provider satisfaction<br>RQ2.4.c Effect of tailored/specialized plans on provider satisfaction | Table 2.4 | None (Pre/Post or Post-only) | Provider Survey (6) | Interrupted time series |
| RQ2.4.b Effect of standard plans on provider participation<br>RQ2.4.b Effect of tailored/specialized plans on provider participation | Table 2.4 | In/Out of State Controls | Claims (1, 27), Encounters (2, 3), | Difference-in-Differences |
| **Hypothesis 2.5** | | | | |
| RQ 2.5.a Effect of managed care on provider satisfaction | Table 2.5 | Pre/Post | Provider survey (6) | Interrupted Time Series |
| RQ 2.5.b Effect of managed care on provider participation | Table 2.5 | In/Out of State Controls | Claims (1, 27), Encounters (2, 3) | Differences-in-differences and Interrupted Time Series |
| **Hypothesis 3.1** | | | | |
| RQ3.1.a Effect of expanded SUD services on quality of care for SUD | Table 3.2 | In/Out of State Controls | Claims (1, 27), Encounters (2, 3), IMD data (4), DOC (19), Death | Difference-in-Differences |

| Abbreviated Research Question | Location of Outcome Measures | Comparison Group | Data Sources (Data source #s from Table 6) | Analytic Methods |
|---|---|---|---|---|
| RQ3.1.b Effect of expanded SUD services on outcomes for SUD | | | Certificate data (13) | |
| **Hypothesis 3.2** | | | | |
| RQ3.2.a Effect of expanded SUD services on Rx for OUD<br>RQ3.2.b Effect of expanded SUD services on Sevices for OUD<br>RQ3.2.c Effect of expanded SUD services on opioid use | Table 3.1 | In/Out of State Controls | Claims (1, 27), Encounters (2, 3), DEA data (16), Licensure data (15), CSRS (17) | Difference-in-Differences |
| **Hypothesis 3.3** | | | | |
| RQ3.3 a-f Effect of expanded SUD services on total costs and cost components for people with SUD diagnoses | Table 3.3 | In/Out of State Controls | Claims (1, 27), Encounters (2, 3), MEPS (22) | Difference-in-Differences |

### e. Target and Comparison Populations

#### i. Target Populations

For most quantitative analyses, target populations will be defined from enrollment, claims, and encounter data. Analyses will be conducted at the beneficiary level for most measures, although re-admission analyses will be conducted at the hospital stay level. Many measures examine the full population of Medicaid beneficiaries, which will include those enrolled in Medicaid managed care for the relevant period (month, quarter, or year). Many hypotheses are specific to either populations in tailored plans or in standard plans, and thus target populations will be limited to those enrolled in these plans for the period enrolled. For baseline (pre-implementation, prior to Nov 1, 2019 for standard plans or 2021 for tailored or specialized plans) data, prior to attribution of enrollees to specific PHPs and benefits, we will use the tailored and specialized plan definitions from the Medicaid Managed Care Final Policy

Guidance: Behavioral Health and Intellectual / Developmental Disability Tailored Plan Eligibility and Enrollment document[5], which are based on diagnoses and other information from the claims and enrollment files. Some measures are relevant only for subpopulations, such as beneficiaries with diabetes. We will use diagnoses available in the claims and encounter data, acknowledging that this approach is efficient from an evaluation cost perspective, but will undercount individuals with the diagnosis, since not all diagnoses are recorded in claims; this is especially true for behavioral health diagnoses. This will have the result of biasing the estimation sample towards those with either longer term or more acute illness, but makes the estimates comparable to the numerous other studies that use claims data for identification.

We will conduct a limited number of subpopulation analysis, based on region, age, sex, race/ethnicity, and disability status as well as by key population groups where feasible, in order to contribute to the Disparity Reporting and Tracking from the State's Quality Strategy. We will also stratify some analyses on specific PHPs as motivated by the qualitative and survey analyses in order to between understand differences by characteristic of PHPs (e.g., if some subset of PHPs have a common set of initiatives around tobacco cessation, we will run analyses around tobacco-use outcomes for beneficiaries attributed to these PHPs).

### ii. Comparison Populations

Because of the rapid changes in the Medicaid and scientific environments, a contemporaneous control group is desirable. Our quantitative analysis uses several different control groups for analyses, based on data availability and feasibility, as described below. Control groups will be adjusted for differences in observable characteristics through methods such as inverse probability of treatment weights (also referred to as propensity score methods), coarsened exact matching, and/or synthetic control methods.

#### *1. Within-state controls*

We will use two sets of within-state controls drawn from the Medicaid and Health Choice population: enrollees that meet the criteria for PHP enrollment before the PHPs are implemented, and enrollees in the Phase II regions, who will have their PHPs coverage delivered with a 4-month lag. The second approach is exploratory only and not critical to the evaluation design, and viable as a control group only for a subset of metrics that are expected to be immediately influenced by managed care implementation (e.g., medications, expenditures).

The groups that are either exempt from managed enrollment or will be enrolled in the behavioral health intellectual / developmental disability tailored or specialized foster care plans by Demonstration Year 3 are not an ideal comparison group, because they consist of individuals who may have distinct patterns of care from those enrolled in managed care, such as Dual-

[5] https://files.nc.gov/ncdhhs/BH-IDD-TP-FinalPolicyGuidance-Final-20190318.pdf

enrollees, those with partial Medicaid benefits, or those with high behavioral health service needs.

We are working towards the inclusion of one additional set of in-state controls, which would be drawn from privately insured NC Blue Cross / Blue Shield (BCBSNC) enrollees, to the extent a similar control group can be identified and with permission from the data custodian. These data have been requested; once they are in hand, we will explore the trends in the outcome variables relevant for those in the standard plans to determine whether the trends in the baseline period are similar between those in the standard plans and BCBSNC enrollees.

*2. Out-of-state controls*

The Evaluation Team is also exploring the use of comparison Medicaid enrollees from one or more other states' Medicaid programs. While these controls would be ideal to control for changes in national or regional events, such as changes in the labor market that may expand or contract the Medicaid population, changes in the scientific knowledge base and FDA-approved drugs or devices, there are a number of downsides to using out-of-state comparisons. First, it would be ideal to identify one state that has similar levels and trends in outcome metrics during the baseline period and thus serves as a counterfactual to the changes from NC's Medicaid waiver. However, due to the considerable heterogeneity among states in characteristics of their Medicaid programs, provider supply, and patient populations, it is close to impossible to identify a state that meet this requirement. In addition, as described above, the first step in the analysis would be to identify whether the trends in each of the measures specified in Tables 1.1-3.2 above are similar between the intervention and comparison groups. In order to do this, we would need to have the states' data in hand and to run algorithms to generate analytic files from each of these states, not knowing whether the states' data will have similar trends, leading to a non-zero probability of rejection. This is a fairly costly proposition with considerable uncertainty that the investment will pay off, if the trends are not similar. Finally, acquiring another state's data takes relationship-building and a considerable investment in programming effort, as each state's data can differ substantially in format and content. Acquiring data from CMS through MSIS or T-MSIS data sources that are contributed by states and further cleaned by CMS and its subcontractor is being explored as a possibility, although this approach adds a considerable time lag to comparison data, meaning that the full difference-in-differences model described above can only be implemented with a likely 1-3 year lag (e.g., analysis of the first year post-implementation would only be available at least 1-3 years later). Finally, another option under consideration is the use of one or more comparison states through a distributed network approach, which would not allow pool analysis, but would allow the comparison of trends across states in a limited number of outcome measures. AcademyHealth's State University Partnership Learning Network (SUPLN) is investigating the use of a distributed network for our and other states' 1115 waiver evaluations.

In collaboration with NC DHHS, the Evaluation Team is actively involved in discussions with Oklahoma to examine the comparability of Medicaid patterns of utilization

between the two states. Initial comparisons indicate that the relative per enrollee expenditures between the two states are similar, potentially indicating the levels of utilization may also be similar. In addition, conversations with the SUPLN members is progressing as well, as a potential back up plan.

Finally, for national data sets such as the Behavioral Risk Factor Surveillance System (BRFSS), we will draw contemporaneous controls from other states, segmented by their managed care implementation status, thus comparing North Carolina respondents' values to respondents in other states that have and have not yet implemented a capitated managed care program.

**d. Evaluation Period**

The evaluation study period runs from January 1, 2014 – October 31, 2024, five years prior to Demonstration Year 1, and through the end of the demonstration. There are at least four distinct time periods that we will use for the quantitative evaluation, described below. If the demonstration is altered in a substantial way after its initial approval, these periods may be modified.

We will consider the baseline time period from January 1, 2014-June 30, 2019, prior to expected implementation of the SUD components of the waiver. An additional baseline time period of July 1, 2019 – January 31, 2020 is relevant for the implementation of the standard plans. For most of the analyses for Goals 1 and 2, we will limit the baseline analysis period to be five years prior to PHP implementation, February 1, 2015-January 31, 2020. The third relevant period is during the implementation of standard plans only, beginning February 1, 2020 – June 30, 2021. During this time period, the population that is to be enrolled in tailored and specialized plans will continue to be in fee-for-service coverage for medical care, and will continue to receive behavioral health care and care for I/DD through the LME/MCOs, which will continue to be paid as Prepaid Inpatient Healthcare Plans. Populations excluded from LME-MCOs (e.g., NC Health Choice, children under age 3) will continue to obtain behavioral health services through FFS. During the third evaluation time period, the standard plans will be phased in on a regional basis, with a 4-month lag between implementation in the Phase I regions and implementation in the Phase II regions. In addition, during the third evaluation time period, the ECMOS Pilots will be phased in. Finally, the fourth evaluation time period will reflect the full implementation of the standard, tailored, and specialized plans, and is expected to run from the fall of 2021 – October 31, 2024.

**e. ECMOS Pilots and interactions among waiver components**

Individuals who are enrolled in a PHP in a selected pilot region and are eligible for pilot services will be potentially affected both by the transition to the PHP as well as by the additional pilot services. In addition, pilot service receipients may be in a practice that is designated as an Advanced Medical Home, and thus may receive care management services from their AMH, PHP, or other local management entity. Fortunately, these events happen at different time

periods at the initial launch of managed care (SP and AMH implementation is Feburary 1, 2019, 2020 while pilot services will begin to be delivered in late 2020 or early 2021). Pilot services will be examined in a separate evaluation and thus the evaluation methods will not be described here. However, pilot enrollees will be included in all analyses of PHP enrollees. In addition, once pilot enrollees can be identified through their receipt of services, we will be able to conduct additional analyses of PHPs and other components of the waiver excluding pilot enrollees in order to be able to tease out the effect of the PHP without the additional effects of pilot services.

Our general strategy allows for isolation of separate effects of many but not all of the waiver components, generally based on temporal separation of waiver components, or on selection criteria for specific components, such as the regional implementation of the pilots or the identification of AMH practices. Some waiver components that will be implemented contemporaneously, such as AMHs that launch at the same time as PHPs, for example, may not allow for identification of separate effects. For example, if most PHP enrollees are also receiving care from an AMH, we may not be able to identify the separate effects due to PHPs independent of AMHs. We will constantly stay up-to-date on waiver and managed care events, and will revise evaluation analyses accordingly to provide the most policy relevant results on the specific components of the waiver and managed care program.

### D. Data Sources

Table 8: Data Sources Requested for 1115 Waiver Evaluation

| Data Source | Data Custodian | Periodicity | Dates Requested | Frequency of data needed |
|---|---|---|---|---|
| **1. FFS Claims data** | DHHS | Continuous | January 1, 2014 – Oct 31, 2024 | Monthly |
| **2. LME/MCO encounter data**[a, b] | DHHS | Continuous | January 1, 2014 – June 30, 2021[c] | Monthly |
| **3. PHP encounter data**[a, b] | PHPs | Continuous | February 1, 2020 – Oct 31, 2024 | Monthly |
| **4. State Operated Facility utilization (public "IMD" utilization)** [b] | State Operated Facilities | Continuous | January 1, 2014 – Oct 31, 2024 | Monthly |
| **5. CAHPS** | DHHS will contract with an EQRO to implement the Adult and Child Version of the | Annual | 2014 - 2024 | Annually, or as administered |

| Data Source | Data Custodian | Periodicity | Dates Requested | Frequency of data needed |
|---|---|---|---|---|
| | Health Plan Survey annually | | | |
| **6. Provider Surveys[d]** | UNC-CH | Annual | 2019 - 2024 | |
| **7. NC Resource Platform / NCCare360 / pilot data [b]** | DHHS/Unite US/Foundation for Health Leadership & Innovation | Continuous | 2019-2024 | Quarterly |
| **8. Care management data [b]** | DHHS / CCNC / PHPs / LHD / AMHs / TP care management entities | Continuous | 2014 - 2024 | Quarterly |
| **9. PHP data - Plan data outside of encounter data that is reported to DHHS, include provider registries/networks** | PHPs | Annual | February 1, 2020 – October 31, 2024 | Annual or as reported |
| **10. Comprehensive Clinical and Diagnostic Assessments** | PHPs | Continuous | February 1, 2020 – October 31, 2024 | Monthly or as reported |
| **11. Immunization registry data [b]** | DPS | Continuous | January 1, 2014 – Oct 31, 2024 | Quarterly |
| **12. Birth Certificate Data [b]** | State Center for Health Statistics | Continuous | January 1, 2014 – Oct 31, 2024 | Annually |
| **13. Death Certificate Data [b]** | State Center for Health Statistics | Continuous | January 1, 2014 – Oct 31, 2024 | Annually |
| **14. BRFSS [d]** | CDC / Publicly available | Annual | 2014 - 2024 | Annually |
| **15. Active, licensed providers in NC with prescribing privileges) (MD, DO, NP, PA) [d]** | Either NC Licensure data or NPPES | Continuous | 2014 - 2024 | Annually |
| **16. Number of providers with DEA DATA 2000 Waivers [d]** | DEA (requires subscription) | Monthly | 2014 - 2024 | Monthly |

| Data Source | Data Custodian | Periodicity | Dates Requested | Frequency of data needed |
|---|---|---|---|---|
| **17. Controlled Substances Reporting System [b]** | DHHS | Continuous | January 1, 2014 – Oct 31, 2024 | Monthly |
| **18. Practice Grouper, if not available through DHHS (tentative, not included in budget) [d]** | IQVIA | TBD | January 1, 2014 – Oct 31, 2024 | Quarterly |
| **19. NC Department of Corrections Data (tentative, not included in budget) [b]** | NC DOC | Continuous | January 1, 2014 – Oct 31, 2024 | Quarterly |
| 20. **NC Treatment Outcomes and Program Performance System (NC-TOPPS) [b] [tentative, subject to conversation with Data Custodian]** | NC DHHS | Continuous | January 1, 2014 – June 30, 2024 Oct 31, 2024 | Annually |
| **21. NC Hospital Discharge Data [d]** | DHSR | Annual | 2014 - 2024 | Annually |
| **22. Medical Panel Expenditure Survey [d]** | AHRQ | Annual | 2014 - 2024 | Annually |
| **23. National Survey on Drug Use and Health [d]** | SAMHSA | Annual | 2014 - 2024 | Annually |
| **24. Medicare data for dual eligibles [b]** | CMS to DHHS | Continuous | January 1, 2014 – Oct 31, 2024 | Monthly |
| **25. Data from local health departments related to high risk maternity and peds populations [b]** | LHDs | Continuous | January 1, 2014 – Oct 31, 2024 | Monthly |
| **26. State surveys related to surveys related to BH/SUD and I/DD** | DHHS | Annual | 2014 - 2024 | Annually |

[a] Encounter data are assumed to have actual payment information to service providers.

[b] Requires linkage to Medicaid identifiers

[c] The LME/MCO system is expected to no longer exist as of July 1, 2021

[d] does not require assistance from DHHS for access

**Table 9: Measures**

| Measure Number | Measure | Measure Custodian | Data source | Used for hypotheses |
|---|---|---|---|---|
| **1.** | Getting Care Quickly | NQF #: 0006 / AHRQ | CAHPS | 1.1 |
| **2.** | Getting Needed Care | NQF #: 0006 / AHRQ | CAHPS | 1.1 |
| **3.** | Use of primary care services | Quality Strategy Objective 2.3 | Claims / Encounters | 1.1 |
| **4.** | Adolescent Well-Care | NCQA – HEDIS 17168 | Claims / Encounters | 1.1 |
| **5. – 8.** | Children and Adolescents' Access to Primary Care Practitioners (4 measures) | NQF#: 2371 / NCQA - HEDIS | Claims / Encounters | 1.1 |
| **9.** | (Any) Annual Dental Visits | NQF#: 1388/ NCQA - HEDIS | Claims / Encounters | 1.1 |
| **10.** | Dental Sealants for Children at Elevated Caries Risk | NQF#: 2508/ NCQA – HEDIS / ADA | Claims / Encounters | 1.1, 1.5 |
| **11.** | Up to date on Childhood Immunizations | NQF#: 0038 / NCQA - HEDIS | Claims / Encounters/ immunization registry | 1.1, 1.4 |
| **12. – 13.** | Immunizations for Adolescents (2 measures) | NQF#: 1407 / NCQA - HEDIS | Claims / Encounters/ immunization registry | 1.1, 1.4 |
| **14.** | Customer Service | NQF #: 0006 / AHRQ | CAHPS | 1.1 |
| **15.** | Rating of Health Plan | NQF #: 0006 / AHRQ | CAHPS | 1.1 |
| **16.** | Rating of all Health Care | NQF #: 0006 / AHRQ | CAHPS | 1.1 |
| **17.** | Rating of Personal Doctor | NQF #: 0006 / AHRQ | CAHPS | 1.1 |
| **18.** | Adult BMI Assessment | NQF#: 0023 / NCQA - HEDIS | Claims / Encounter Data; PHP data | 1.1 |
| **19.** | Weight Assessment and Counseling for | NQF#: 0024/ NCQA - HEDIS | Claims / Encounter Data; PHP data | 1.1, 1.4 |

| Measure Number | Measure | Measure Custodian | Data source | Used for hypotheses |
|---|---|---|---|---|
| | Nutrition and Physical Activity for Children/ Adolescents | | | |
| **20.** | Tobacco Use screening and follow-up | NQF# 2600 | Claims / Encounter Data | 1.1 |
| **21.** | Breast Cancer Screening | NQF#: 2372 / NCQA - HEDIS | Claims / Encounter Data | 1.1 |
| **22.** | Cervical Cancer Screening | NQF#: 0032 / NCQA - HEDIS | Claims / Encounter Data | 1.1, 1.4 |
| **23.** | Flu vaccine for Adults age 18-64 | NQF#: 0039 / NCQA - HEDIS | Claims / Encounter Data | 1.1, 1.4, 1.5 |
| **24.** | Appropriate Testing (for strep) for Children with Pharyngitis | NQF#: 0002 / NCQA - HEDIS | Claims / Encounter Data | 1.1 |
| **25.** | Appropriate Treatment for Children with Upper Respiratory Infection | NQF#: 0069 / NCQA - HEDIS | Claims / Encounter Data | 1.1, 1.5 |
| **26.** | Medication Management for People with Asthma | NQF#: 1799 / NCQA - HEDIS | Claims / Encounter Data | 1.1, 1.4 |
| **27.** | Asthma Medication Ratio | NQF#: 1800 / NCQA - HEDIS | Claims / Encounter Data | 1.1, 1.4 |
| **28.** | Avoidance of Antibiotic Treatment in Adults with Acute Bronchitis | NQF#: 0058 / NCQA - HEDIS | Claims / Encounter Data | 1.1 |
| **29.** | Annual Monitoring for Patients on Persistent Medications | NQF#: 2371 / NCQA - HEDIS | Claims / Encounter Data | 1.1 |
| **30. – 31.** | Pharmacotherapy Management of COPD Exacerbation | NQF#: 2856 / NCQA - HEDIS | Claims / Encounter Data | 1.1 |

| Measure Number | Measure | Measure Custodian | Data source | Used for hypotheses |
|---|---|---|---|---|
| | (2 measures) | | | |
| **32. – 33.** | Statin Therapy for Patients with Diabetes (2 measures) | NQF#: 0547 / NCQA - HEDIS | Claims / Encounter Data | 1.1 |
| **34.** | Diabetes Screening for People with Schizophrenia or Bipolar Disorder who are Using Antipsychotic Medications | NQF#: 1932 / NCQA - HEDIS | Claims / Encounter Data | 1.1 |
| **35. – 36.** | Statin Therapy for Patients with Cardiovascular Disease (2 measures) | NQF#: 0543 / NCQA - HEDIS | Claims / Encounter Data | 1.1 |
| **37.** | Visits in the First 15 Months of Life | NQF#: 1392 / NCQA - HEDIS | Claims / Encounter Data | 1.1 |
| **38.** | Well-Child Visits in the Third, Fourth, Fifth, and Sixth Years of Life+ | NQF#: 1516 / NCQA - HEDIS | Claims / Encounter Data | 1.1, 1.4 |
| **39.** | Concurrent Use of Prescription Opioids and Benzodiazepines | PQA | Claims / Encounter Data | 1.1, 3.1 |
| **40.** | Use of Imaging Studies for Low Back Pain | NQF#: 0052 / NCQA - HEDIS | Claims / Encounter Data | 1.1 |
| **41.** | Chlamydia Screening in Women | NQF#: 0033 / NCQA - HEDIS | Claims / Encounter Data | 1.1 |
| **42.** | Screening for pregnancy risk | NC Administrative Measure | Claims / Encounter Data | 1.1 |
| **42.** | Frequency of Prenatal Care (>=81% of expected visits) | NQF#: 1391 / NCQA - HEDIS | Claims / Encounter Data | 1.1 |
| **43.** | Prenatal and Postpartum Care+ | NQF#: 1517 / NCQA - HEDIS | Claims / Encounter Data | 1.1 |

| Measure Number | Measure | Measure Custodian | Data source | Used for hypotheses |
|---|---|---|---|---|
| **44.** | Pregnant smokers screened and treated for tobacco use | NC Modified measure | Birth certificate / Claims / Encounter Data | 1.1 |
| **45.** | All-Cause Hospital Readmission | NQF#: 1768 / NCQA - HEDIS | Claims / Encounter Data | 1.1, 1.4 |
| **46. – 47.** | 30-day hospital readmission rate following hospitalization for SUD or OUD | -- | Claims / Encounter Data | 1.1 |
| **48.** | Comprehensive Diabetes Care: HbA1c poor control (>9.0) + | NQF#: 0059 / NCQA - HEDIS | Claims / Encounter Data | 1.1, 1.4 |
| **49. – 57.** | Comprehensive Diabetes Care (9 measures) | NQF#: 0061, 0575, 0055 / NCQA - HEDIS | Claims / Encounter Data | 1.1 |
| **58.** | Diabetes Short-term Complication Admission Rate | PQI-01, PDI-15 | Claims / Encounter Data | 1.1, 1.4 |
| **59.** | Controlling High Blood Pressure | NQF#: 0018 / NCQA - HEDIS | Claims / Encounter Data | 1.1, 1.4 |
| **60.** | COPD or Asthma in Older Adult Admissions | PQI-05 | Claims / Encounter Data | 1.1, 1.4 |
| **61.** | Heart Failure Admissions | PQI-08 | Claims / Encounter Data | 1.1, 1.4 |
| **62.** | Receipt of Preventative Dental Services | NQF#: 1334 / CMS-416 | Claims / Encounter Data | 1.1 |
| **63.** | Asthma Admissions in Younger Adults | PQI-15 | Claims / Encounter data | 1.1, 1.4 |
| **64.** | Gastroenteritis Admissions | PDI-15 | Claims / Encounter data | 1.1, 1.4 |
| **65.** | Urinary Tract Infection Admissions | PDI-18 | Claims / Encounter data | 1.1, 1.4 |
| **66.** | Death rate by group (e.g., SUD, SMI) | -- | Claims / Encounter data linked with death certificate data | 1.1 |

| Measure Number | Measure | Measure Custodian | Data source | Used for hypotheses |
|---|---|---|---|---|
| **67.** | Live Births Weighing Less than 2500 Grams + | NQF#: 1382 / CDC (NC Modification) | Birth Certificate / Medicaid eligibility | 1.1 |
| **68.** | Infant Mortality | | Birth Certificate / Death Certificate data | 1.1 |
| **69.** | Healthy Days | | BRFSS | 1.1 |
| **70.** | Tobacco Use Rate (multiple measures) | Public Health Measures | BRFSS / CAHPS | 1.1 |
| **71.** | Overweight / Obesity Rate | -- | BRFSS / CAHPS | 1.1 |
| **72.** | Death rate post prison release | -- | Death Certificate data linked with DOC data and Medicaid enrollment, claims, and encounters | 1.1 |
| **73. – 74.** | Antidepressant Medication Management (two measures) | NQF#: 0105/ NCQA - HEDIS | Claims / Encounter data | 1.2, 1.4 |
| **75.** | Depression screening among those with SUD | NQMC: 004006 | Claims / Encounter data | 1.2 |
| **76. – 77.** | Follow-up After Hospitalization for Mental Illness or Alcohol / Other Drug Treatment+ (7/30 days) | NQF#: 0576/ NCQA - HEDIS | Claims / Encounter data | 1.2, 1.4 |
| **78. – 79.** | Follow-up for Children Prescribed ADHD Medication (2 measures) | NQF#: 0108/ NCQA - HEDIS | Claims / Encounter data | 1.2, 1.4, 1.5 |
| **80.** | Initiation and Engagement of SUD Treatment+ | NQF#: 0004/ NCQA - HEDIS | Claims / Encounter data | 1.2, 1.5, 3.1 |
| **81.** | Medical Assistance with Smoking and Tobacco Use Cessation | NQF#: 0027/ NCQA - HEDIS | Claims / Encounters; PHP data; CAHPS | 1.2, 1.4 |

| Measure Number | Measure | Measure Custodian | Data source | Used for hypotheses |
|---|---|---|---|---|
| **82.** | Continuity of Pharmacotherapy with OUD | NQF#: 3175 | Claims / Encounter data | 1.2 |
| **83.** | Concurrent Use of Prescription Opioids and Benzodiazepines | PQA | Claims / Encounter data | 1.2 |
| **84. – 85.** | ED visits for SUD-related diagnoses and specifically for OUD (2 measures) | NQF: 2605 | Claims / Encounter data | 1.2, 3.2 |
| **86.** | IP visits for SUD and specifically for OUD | -- | Claims / Encounter data | 1.2, 3.2 |
| **87.** | Adherence to Antipsychotic Medications for Individuals with Schizophrenia | NQF# 1879 NCQA - HEDIS | Claims / Encounter data | 1.2, 1.5 |
| **88.** | Use of behavioral health care for people with SMI or SUD | -- | Claims / Encounter data | 1.2 |
| **89.** | Use of pharmacotherapy for opioid use disorder (OUD) | NQF 3400 | Claims / Encounter data | 1.3 |
| **90.** | Number of providers with DEA DATA 2000 waivers | -- | DEA data | 1.3, 3.2 |
| **91.** | Number of providers with DEA DATA 2000 waivers who have written prescriptions for Medicaid enrollees for MAT | -- | DEA data and Claims/Encounter data | 1.3, 3.2 |
| **92.** | Percent of SUD diagnosed beneficiaries who receive an SUD treatment service | -- | Claims/Encounter data | 1.3, 3.1 |
| **93.** | Long-Term Use of Opioids | | Claims / Encounter data, CSRS | 1.3, 3.2 |

| Measure Number | Measure | Measure Custodian | Data source | Used for hypotheses |
|---|---|---|---|---|
| **94.** | Use of Opioids at High Dosage in Persons without Cancer | NQF#:2940/ PQA | Claims / Encounter data, CSRS | 1.3, 3.2 |
| **95.** | Use of Opioids from Multiple Providers in Persons Without Cancer | NQF#:2950/ PQA | Claims / Encounter data, CSRS | 1.3 |
| **96.** | Reduced incarceration for drug-related charges | -- | DOC data | 1.3 |
| **97.** | Number / % of practices on the PHP panel that attest to being a level 3 AMH | | PHP data | 1.4 |
| **98.** | Number of enrollees attributed to an Advanced Medical Home | Quality Strategy Objective 2.2 | Enrollment data | 1.4 |
| **99.** | Number of enrollees receiving care management | -- | Claims / encounters / enrollment | 1.4 |
| **100.** | Number of ED visits | NCQA - HEDIS | Claims/Encounter data | 2.1 |
| **101.** | Avoidable or preventable emergency department visits | NYU / Billings algorithm | Claims/Encounter data | 2.1 |
| **102.** | Number of hospital admissions | -- | Claims/Encounter data | 2.1 |
| **103.** | Number of hospital days | -- | Claims/Encounter data | 2.1 |
| **104.** | Hospital admissions for ambulatory sensitive conditions; avoidable or preventable inpatient hospitalizations | AHRQ PQI and PDI | Claims/Encounter data | 2.1 |
| **105.** | Coordination of Care (consumer perceptions) | NQF #: 0006 | CAHPS | 2.2 |

| Measure Number | Measure | Measure Custodian | Data source | Used for hypotheses |
|---|---|---|---|---|
| **106.** | Time to SDOH Screening from PHP attribution | -- | Claims / Encounter data ; PHP data; NCcare360 | 2.2 |
| **107.** | Enrollees Receiving Care Management during transitions in care | Enrollees Receiving Care Management during transitions in care | Claims / Encounter data; care management data systems | 2.2 |
| **108.** | Medication Reconciliation Post-Discharge | Medication Reconciliation Post-Discharge | Claims / Encounter data | 2.2 |
| **109.** | Total Expenditures to the Medicaid program and components | -- | Claims / Encounter data | 2.3, 3.3 |
| **110.** | Out-of-pocket costs to Medicaid enrollees | -- | Claims / Encounter data | 2.3, 3.3 |
| **111.** | Costs of Medicaid funded services and components | -- | Claims / Encounter data | 2.3, 3.3 |
| **112.** | Provider satisfaction | (under development) | Provider survey | 2.4 |
| **113.** | Provider participation in Medicaid | (under development) | Claims / Encounter data | 2.4 |
| **114.** | Percent of diagnosed beneficiaries who receive a treatment service | -- | Claims / Encounter data | 3.1 |
| **115.** | Death rate from overdose | -- | Claims / Encounter data linked with death certificate data | 3.2 |
| **116.** | Death rate from overdose post-release | -- | Death Certificate data linked with DOC data and Medicaid enrollment, claims, and encounters | 3.2 |
| **117.** | Percent of enrollees diagnosed with OUD receiving MAT | CMS | Claims / Encounter data | 3.2 |
| **118.** | Percent of enrollees diagnosed with OUD | -- | Claims / Encounter data | 3.2 |

| Measure Number | Measure | Measure Custodian | Data source | Used for hypotheses |
|---|---|---|---|---|
| | receiving non-medication opioid treatment services | | | |

### E. Methodological Limitations

Our analysis approach uses distinct time periods to examine different phases of waiver activities, although in reality, these are not as distinct as would be ideal. Efforts to create a managed care waiver were initiated by North Carolina's General Assembly some time before the baseline time period incorporated here. If provider behavior changed as a result of expectations of upcoming changes, then our baseline period would not capture a true baseline, but rather a baseline under increasing expectation of managed care implementation. We will use breakpoint analysis to examine whether outcomes may have changed prior to key implementation dates to see if there may have been anticipation effects. An additional concern when using encounter data is how accurate and complete these data are, given that the incentives for complete reporting are dampened over fee-for-service claims. Any deficits in quality of encounter data would confound the PHP analyses, since they would be contemporaneous to the implementation of capitated care. The evaluation team will continuously monitor the quality of encounter data as the PHPs are implemented, following monitoring techniques used to monitor encounter data in the MAX data, for example. We will report any data quality concerns to NC DHHS as soon as they are discovered, in an effort to improve data quality as the demonstration continues. We will also compare trends in utilization measures from encounter data to similar measures in NC claims data (Medicaid and BCBSNC) as well as external data sources (e.g., trends in the MEPS and BRFSS data), although these sources tend to have a greater lag. Finally, the evaluation will not be able to assess all aspects of the Demonstration due either to data limitations or statistical limitations. For example, we will not have information on enrollees' labor market status and thus cannot evaluate whether improved services increase the ability of enrollees to participate in the labor market. We also may not have complete information on provider satisfaction and engagement for those providers who are not currently participating in the Medicaid program. As new providers begin serving patients through PHPs, we will have records of these interactions, but will not be able to capture information from providers who do not serve enrollees in any given year. In addition, if participation in AMHs is high, we may not be able to assess the impact of AMH participation using in-state controls. We will contiuously seek ways to overcome these limitations throughout the evaluation period.

**Attachment 1: Independent Evaluator**

As stated in the Special Terms and Conditions, the State is required to select an independent evaluator for the 1115 Waiver Evaluation. Key requirements for the evaluator are that the evaluator be free of any conflict of interest, have experience with large scale evaluations, have experience working with the necessary data sources and types to evaluate the waiver, and have expertise with the evaluation methodologies that will be needed to evaluate the waiver. Further, the evaluator must be able to conduct a fair and impartial evaluation and prepare an objective evaluation report. Considering these factors, the State selected the Cecil G. Sheps Center for Health Services Research at The University of North Carolina at Chapel Hill ('the Sheps Center') to conduct the evaluation. The Sheps Center has a long history over several decades working with North Carolina Medicaid data (claims, provider, and de-identified beneficiary) and other state data sources including from Divisions of Public Health/State Health Statistics and Mental Health, Substance Use Disorder, and Intellectual/Developmental Disabilities. A thorough conflict of interest investigation was undertaken at the university level, and each investigator from the Sheps Center team had to complete a multi-faceted conflict of interest questionnaire. The team was found to have no conflicts of interest and the report has been attached. Under a Master Data Use Agreement, the Sheps Center will have access to necessary data and stringent conflict of interest policies are in place to ensure the absence of conflict of interest in the evaluation.

## Attachment 2: Conflict of Interest Statement

THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL

OFFICE OF THE VICE CHANCELLOR FOR RESEARCH
CONFLICT OF INTEREST PROGRAM

BYNUM HALL, ROOM 301D
222 E. CAMERON AVENUE
CAMPUS BOX 9103
CHAPEL HILL, NC 27599-9103

T 919.843.9953
F 919.843.9005
coi@unc.edu

**Conflict of Interest Certification Form**

Sponsor: North Carolina Department of Health and Human Services (NCDHHS)
Reference: Contract #38132
UNC-CH Title: NC 1115 Waiver Evaluation
UNC-CH Lead PI: Marisa Domino
UNC CH Internal Reference: 18-5099

This letter is to certify that the University of North Carolina at Chapel Hill maintains a written policy and an administrative process for identification, evaluation and reporting of financial conflicts of interest meeting the requirements of Title 42 CFR Part 50, Title 42 CFR Part 94, Subpart F, NSF AAG Chapter IV.A, FAR 9.5 and other applicable federal regulations. Additionally, the Conflict of Interest Program at the University maintains a process of individual or organizational conflict of interest review which is responsive to any Sponsor's application or guidelines requesting this type of review.

Therefore, to the best of the Institution's knowledge and belief, it certifies:

**ORGANIZATIONAL CONFLICTS OF INTEREST:**
There are no facts relevant to any possible sources of organizational conflict of interest (such as ownership or proprietary rights) in conducting the research as defined in the proposal guidelines.

**INDIVIDUAL CONFLICTS OF INTEREST:**
This section certifies that any individual team members of Institution, who will perform work as investigators under this project have completed the disclosure process and there is a conflict of interest to report, as defined in the proposal guidelines.

Dr. Pam Silberman, a co-investigator on this project, serves on the Board of Directors of Alliance Behavioral Healthcare, an entity subject to the policies evaluated in this project. The University has determined that the management for this relationship is as follows:

Disclosure in any public dissemination
Agreement and understanding that Dr. Silberman cannot discuss with Alliance Behavioral Healthcare (including but not limited to its Board, employees, volunteers), any on-going UNC research findings (such as what the policies are likely to be) until public dissemination of such policies.
If by some odd chance, the Alliance is used as an example or somehow brought into the policy or research discussion, Dr. Silberman would recuse herself from providing any commentary, opinion or analysis.

Dr. Marisa Domino, the Principal Investigator at the University, is aware of the above conflict and the related management.

**FUTURE CONFLICTS OF INTEREST:**

The individuals working on this project have been informed of their obligation to promptly report personal and/or organizational conflicts of interest to the Institution. The Institution will promptly report in writing to UNC-Chapel Hill's Award Specialist any organizational or individual conflicts of interest that may arise during the performance contract. The UNC-CH Award Specialist will coordinate any positive responses with the Sponsor.

By:

Name: _____Joy Bryde_____

Title: ____Conflict of Interest Officer_____

Date: ____15 February 2019_____

**Attachment 3: Evaluation Budget**

The estimated budget for the Evaluation of the 1115 and SUD waivers is approximately $1.5 million per demonstration year, running from May 1, 2019 – December 31, 2026, for a total of approximately $10.7 million. This budget covers expenses relating to the quantitative and qualitative analysis using numerous sources of data and mixed methods approaches. This amount covers salaries, fringes, administrative costs, direct costs for travel around the state for primary data collection, conference calls amoung the study team, computing related expenses, and transcription and coding expenses. The qualitative component accounts for approximately $1.8M while the quantitative component accounts for approximately $5.7M of the budget. The remaining amount are for administrative or expenses shared by both the quantitative and qualitative components that are difficult to distribute. The total amount does not include the Evaluation of the Enhanced Case Management and Other Services Pilots nor of the provider survey, which have been budgeted separately.

The Cecil G. Sheps Center for Health Services Research at UNC-Chapel Hill will perform the 1115 and SUD waiver evaluation in partnership with NC DHHS. Sheps Center faculty and staff have decades of experience in policy evaluation, including mixed methods evaluations with claims data analysis, survey data fielding and analysis, and qualitative interview and focus group analysis. The multidisciplinary team has expertise on a number of dimensions important to this project, including behavioral health, CMS processes and procedures, Federal waivers, financial and economic analyses, administrative data analytics, organizational behavior, quality of care metrics, data visualization, implementation science, social determinants of health, and safety net providers.

**Attachment 4: Timeline and Major Milestones**

Waiver Evaluation: Key Milestones

| Activity | DY0 | DY1 | DY2 | DY3 | DY4 | DY5 | DY6 | Post |
|---|---|---|---|---|---|---|---|---|
| **Waiver Milestones** | | | | | | | | |
| Procure evaluation contractor | | | | | | | | |
| Release RFP for standard plans | | | | | | | | |
| SUD Component Implementation | | | | | | | | |
| Implementation of standard plans | | | | | | | | |
| Release RFP for tailored and specialized plans | | | | | | | | |
| PHPs performance evaluated against Priority Measure Set | | | | | | | | |
| Implementation of tailored and specialized plans | | | | | | | | |
| **Evaluation Milestones** | | | | | | | | |
| Contract for Evaluation Design | | 3/19 | | | | | | |
| Contract for Evaluation | | 5/19 | | | | | | |
| Hold regular meetings between DHHS and Evaluation team | | | | | | | | |
| Collaborate on data sharing to facilitate evaluation | | | | | | | | |
| Receipt of baseline claims and encounter data for the evaluation | | | | | | | | |
| Calculation of Baseline Metrics | | | | | | | | |
| Submit Draft Evaluation Design | | | | | | | | |
| Receipt of PHP encounter data for evaluation | | | | | | | | |
| Receipt of other secondary data sources including provider survey data and CAHPS | | | | | | | | |
| Calculation and Monitoring of all Quantitative Metrics | | | | | | | | |
| Submit Quarterly Progress Reports | | 9/19 | | | | | | |
| Submit Annual Report | | | 1/20 | | | | | |
| Submit Draft Interim Evaluation Report | | | | | 11/21 | | | |
| Submit Final Interim Evaluation Report | | | | | | | | |
| Submit Draft Summative Evaluation Report | | | | | | | | |
| Submit Final Summative Evaluation Report | | | | | | | | |
| Submit Final Reports to DHHS | | | | | | | | |

DY=Demonstration Year

DY0 are activities that occurred prior to the implementation of the waiver

DY1= 1/1/2019 – 10/31/2019

DY2=11/1/2019 – 10/31/2020

DY3=11/1/2020– 10/31/2021

DY4=11/1/2021 – 10/31/2022

DY5=11/1/2022 – 10/31/2023
DY6=11/1/2023 – 10/31/2024
Post period extends beyond the end of DY6 for analysis only, pending any renewal or continuation of the waiver.

**Attachment 5: Abbreviations Used**

| | |
|---|---|
| AMH | Advanced Medical Home |
| CMS | Centers for Medicare & Medicaid Services |
| CSRS | Controlled Substances Reporting System |
| DOC | Department of Corrections |
| FFS | Fee-for-service |
| I/DD | Intellectual / Developmental Disability |
| IMD | Institute for Mental Disease |
| MAT | Medication-Assisted Treatment |
| OUD | Opioid Use Disorder |
| PHP | Prepaid Health Plan |
| SUD | Substance Use Disorder |