Utah Section 1115 Demonstration Waiver

2021 Interim Evaluation Report

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Table of Contents

Executive Summary

This report constitutes an interim evaluation of six Section 1115 Waiver components. These include Current Eligibles (CE), Targeted Adults (TA), Utah Premium Partnership (UPP), Blind and Disabled Dental (BDD), and Substance Use Disorder (SUD). A sixth demonstration, the Primary Care Network (PCN) was suspended at the end of March 2019, so there are no new data to provide in this evaluation. The evaluation hypotheses address a variety of demonstration goals established by the Utah Department of Health (UDOH) that are focused on health care utilization and outcomes associated with 1) increased cost sharing (CE); 2) increased dental coverage (BDD) and targeted adults (TA); 3) until its suspension, establishment of the primary care network (PCN); 4) enhanced coverage of the population experiencing homelessness (TA); 5) incentives to enroll in employer-provided insurance (UPP); and 6) an array of substance use disorder services provided in Institutions of Mental Disorders (IMDs) to eligible populations. Included here are a variety of analyses related to specific State goals associated with implementation through November 2020. In some cases, data were neither available nor robust enough to conduct multivariate analyses at the time of reporting. This interim evaluation is issued in accordance with special terms and conditions (STCs) reporting requirements. The data analysis was performed by the independent contractor from Utah Medicaid claims and a beneficiary survey conducted by subcontract. Regarding the CE, TA, BDD, and UPP demonstrations, findings indicate:

1. These preliminary findings do not yet demonstrate statistically significant improvements in access and utilization of appropriate health care and associated health outcomes. Additionally, there is not a reduction in costs reflected among the demonstration populations that is attributable to the incentivized preventive and primary care in lieu of more expensive care such as that provided in the emergency room. The COVID-19 pandemic likely was responsible for some of these trends in 2020.
2. Preliminary results noted in the mid-point assessment among CE enrollees continue to trend in a positive direction with increased hypertension prescriptions per member diagnosed with hypertension over the period analyzed (Table 11) through 2019. During that same period, there was reduced non-emergent use of the ED over the period assessed for CE enrollees (Table 16) that aligned with the reduction in overall ED among that population. It is unclear what drove such improvements. Given the longer duration of the CE demonstration, this may suggest that it will take some time for reduction in non-emergent use to arise among more recent programs. It is plausible that enhanced access to care may initially not reduce or stabilize both emergent and non-emergent ED utilization. However, over time, as preventive and ambulatory care is improved and incentivized, enrollees may exhibit reductions in ED use.
3. The state achieved substantial growth in enrollment in several of the demonstrations between 2017 and 2019 suggesting that the programs are meeting significant needs. This is evident among the TA demonstration, where enrollment nearly doubled. Similarly

smoking cessation program utilization increased as did antidepressant prescriptions and primary care visitations. These results all align with the intent of the demonstration, and better assessment of such access and utilization on health outcomes and cost await longer term data analysis. The BDD program experienced a substantial increase in utilization of preventive dental services between 2018 and 2020, compared to a more modest increase in emergency dental services during the same period. Whether emergency dental utilization subsides with longer exposure to such enhanced access awaits further analysis. The Utah Premium Partnership (UPP) is one program where enrollment has decreased. Access to employer-provided health insurance for this low-income population is likely not substantial, and it is also possible that the incentives in the program for employers to offer such insurance, such as attracting a more skilled and stable workforce in the presence of benefits such as employer-provided insurance is not significant enough to achieve broader success. The impact of COVID-19 on employment may have also contributed to enrollment decline in the program in 2020.

With respect to implementation of the SUD waiver demonstration to date, despite a lack of statistically significant outcomes for each of the five established research hypotheses, there are notable findings:

1. Although lacking statistical significance thus far for the five primary research hypotheses, most of the outcome measures are trending positively in the hypothesized direction, suggesting that additional time for policy and program implementation may be required to detect the impact of the demonstration on the outcomes.
2. For the second year, the beneficiary survey continues to indicate patient experiences with SUD services have been quite favorable and consistent. For example, majority of beneficiaries (68% in 2020 and 67% in 2021) responding to the survey recognize there are specific mental health and substance use disorder services available in their communities, if needed. Of those respondents indicating they or a household member needed these services, 54% in 2020 and 61% in 2021 reported they were able to obtain care “as soon as needed”. When asked to rate counseling or treatment received, the average rating was 6.3/10 in 2020 and 6.4/10 in 2021. For those receiving services, 56% in 2020 and 62% in 2021 found the counseling or treatment to be helpful.
3. The supplemental monitoring metrics based on data compiled by UDOH (contained in the mid-point report in 2021) largely trend positively, indicating State is likely on track to achieve nearly all identified goals. For example, of the individual monitoring metrics, 70% were rated as “low risk” of not being achieved by the end of waiver demonstration.

Overall Impacts of COVID-19

Several factors related to the COVID-19 pandemic have influenced the 1115 waiver implementation. Specifically, these have included delays in healthcare utilization due to limited or no access to services during the initial adjustments to the Public Health Epidemic (PHE). Specifically, there were temporary closures of medical, dental, and behavioral healthcare places of service. Examples of when closures took place include, Intermountain Healthcare (the largest healthcare system in Utah) cancelling non-essential surgeries from March 1, 2020 – March 16, 2020. Among dental services, at the recommendation of the American Dental Association, orthodontic procedures and non-emergency dental care were suspended from March 1, 2020, to March 23, 2020. Behavioral healthcare service access varied by geographical location across the state beginning on March 1, 2020. Fortunately, in Utah most behavioral healthcare service providers were able to transition from in-person to remote treatment services within two weeks. Similarly, there were operational changes due to safety procedures being implemented in medical and dental clinics as well as in hospital emergency departments, urgent care, and other healthcare facilities that delayed or prevented services from being provided. Additionally, in response to the need to shift healthcare resources to address COVID-19 treatment in hospitals, policies were implemented to delay elective surgeries. Finally, one impact of the pandemic on in-person preventive care visits among the targeted adult Medicaid (TAM) population. While the number of preventive care visits per enrollee remained stable, the number of those visits delivered through telehealth increased exponentially from 33 in Q4 of 2019 to 2879 by Q2 2020, and from under 1% of total preventive care visits to over 42% of such visits (see Table 32.1).

In an effort to address the ongoing effects of the COVID-19 PHE impact on the demonstration the independent evaluator submitted (Aug. 31, 2021) a revised evaluation design [e.g. *1115 PCN Waiver – Substance Abuse Disorder Revised Evaluation Design" (under CMS review*)] which focuses on revising the methodology from a Difference-in-differences (DiD) to an Interrupted Time Series (ITS) design to take advantage of monthly rather than annual data, which will support a more comprehensive analysis of data over a longer period of time. This updated approach will increase the likelihood that the evaluation will isolate the effects of the demonstration on the observed outcomes by mitigating COVID-19 impacts. Similarly, other evaluation designs have added sensitivity analyses and falsification tests to help inform the effect of study designs on impact estimates. A more complete discussion of these and other statistical analysis are included in Methodological Limitations is below. Finally, the independent evaluator will conduct a re-analysis of waiver components, using the appropriate methods such as generalized estimating equations (GEE) to address the potential confounding effects related to COVID-19 impacts.

General Background Information

Section 1115 of the Social Security Act permits the Secretary of Health and Human Services to approve demonstration projects that are found by the Secretary to likely assist in promoting the objectives of the Medicaid program. Thus, the Secretary authorizes federal financial support for waiver demonstration costs that would not otherwise qualify for federally matchable expenditures

The two primary purposes of Medicaid funding are to enable each State to furnish (1) medical assistance on behalf of families with dependent children and of aged, blind, or disabled individuals, whose income and resources are insufficient to meet the costs of necessary medical services, and (2) rehabilitation and other services to help such families and individuals attain or retain capability for independence or self-care. The Utah 1115 waiver demonstration project, with its various amendments, seeks to expand the scope of coverage and benefits for certain at-risk beneficiaries. Additionally, these services seek to advance the health and wellness of the individual receiving them, thus contributing to the individual attaining independence. In addition to paying for services, the program also advances the health and wellness needs of its beneficiaries based on actions designed at the state level. Section 1115 demonstration projects offer flexibility to a state to propose new reforms and adjust service delivery with the potential of improving medical care and focus on interventions that drive better health outcomes and quality of life improvements, potentially leading to increased financial independence.

Given the flexibility offered by an 1115 waiver to design and improve health care service and delivery, the Utah Department of Health (UDOH) sought state-specific policy approaches to better serve needy populations. Specific goals [2] to be addressed by the initial 1115 waiver were to:

1. Improve the health of Utahns by increasing the number of low-income individuals without access to primary care coverage, which will improve the overall well-being of the health status of Demonstration Population I enrollees (PCN enrollees). Increase access to, stabilize, and strengthen providers and provider networks available to serve Medicaid and low-income populations.

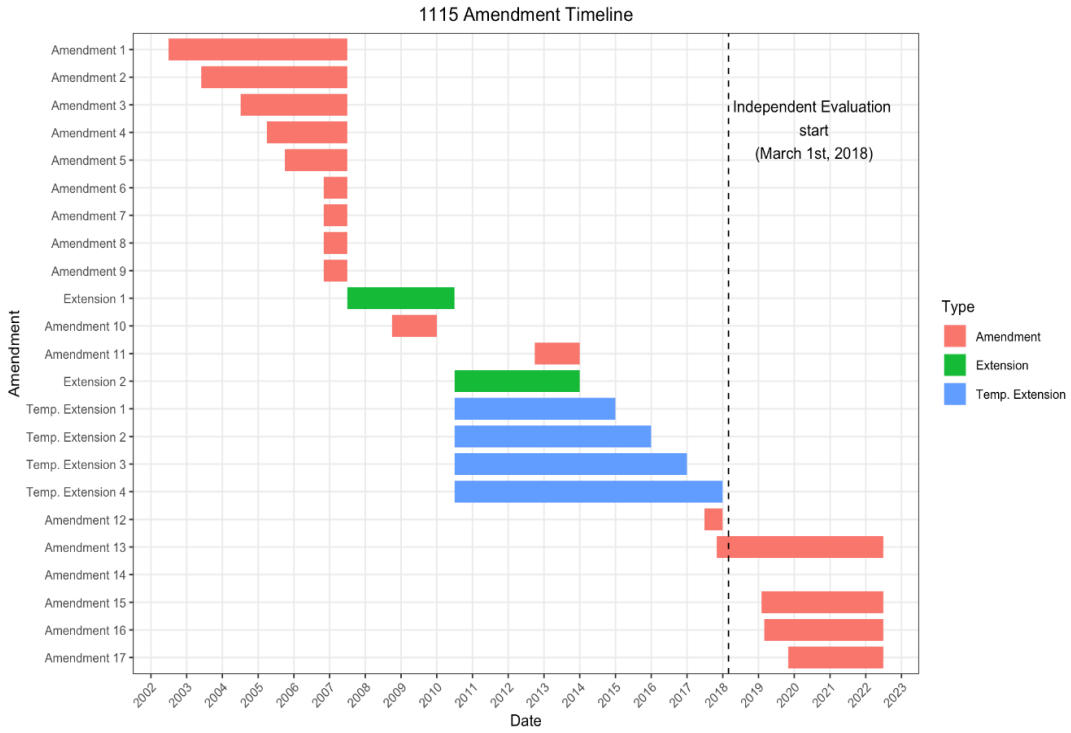
2. Not negatively impact the overall health of Current Eligibles who experience reduced benefits and increased cost sharing.

3. Assist previously uninsured individuals in obtaining employer-sponsored health insurance without causing a decrease in employer's contributions to premiums that is greater than any decrease in contributions to the overall health insurance market.

4. Reduce the number of uninsured Utahns by enrolling eligible adults in the Targeted Adult Medicaid program. Reduce the number of non-emergent Emergency Room visits for the Targeted Adult population.
5. Improve access to primary care, while also improving the health status of the Targeted Adult Population.
6. Provide care that is more extensive to individuals suffering from a substance use disorder, in turn making this population healthier and more likely to remain in recovery.

The Utah 1115 demonstration waiver was first submitted on December 11, 2001, approved on February 8, 2002, implemented on July 1, 2002. It was originally scheduled to expire on June 30, 2007, but since then, there have been six extensions and approximately 17 new waiver amendments [3] (see Figure 1 below).

Figure 1: 1115 Waiver Timeline.


1115 Amendment Timeline
Amendment 1
Amendment 2
Amendment 3
Amendment 4
Amendment 5
Amendment 6
Amendment 7
Amendment 8
Amendment 9
Extension 1
Amendment 10
Amendment 11
Extension 2
Temp. Extension 1
Temp. Extension 2
Temp. Extension 3
Temp. Extension 4
Amendment 12
Amendment 13
Amendment 14
Amendment 15
Amendment 16
Amendment 17
Amendment
Independent Evaluation
start
(March 1st, 2018)
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
Date
Type
Amendment
Extension
Temp. Extension

Description of Demonstration Components Evaluated in the Interim Evaluation Report

Primary Care Network (PCN) includes individuals aged 19 through 64 with incomes at or below 95 percent of the FPL (effectively 100 percent of the FPL considering a disregard of 5 percent of income), who are U.S. citizens/qualified non-citizen, are residents of Utah, are not otherwise eligible for Medicaid, do not qualify for Medicare or Veterans benefits, and do not have other health insurance. PCN was suspended as of March 31, 2019, due to the implementation of Adult Expansion.

Current Eligibles includes the following individuals, whose eligibility is derived from the state plan, but whose coverage is affected by the demonstration: 1) adults aged 19 and above who are eligible through section 1925 and 1931 of the Act, including those eligible through any liberalized section 1931 criteria already in the state plan; 2) adults aged 19 through 64 who are medically needy and not aged, blind, or disabled. Individuals who are pregnant are excluded, through the 60th day postpartum.

Dental Benefits for Aged Individuals - includes individuals who are age 65 and older, and are eligible for Medicaid, who are eligible to enroll in the state plan. They receive dental benefits that are defined in the Utah Medicaid Provider Manual, Dental Services, and if needed, porcelain or porcelain-to-metal crowns.

Dental Benefits for Individuals with Blindness or Disabilities - includes individuals who are blind or disabled, 18 and older, who are enrolled in the state plan. They receive dental benefits that are defined in the Utah Medicaid Provider Manual, Dental Services, and if needed, porcelain or porcelain-to-metal crowns.

Targeted Adults - includes adults, ages 19 through 64, with incomes at zero percent of the FPL (effectively five percent of the FPL with the five percent disregard) and no dependent children, who meet one of the following additional criteria:

- Be chronically homeless, defined as:

1. An individual who has been continuously homeless for at least 12 months or on at least four separate occasions in the last three years (totaling at least 12 months); and has a diagnosable substance use disorder, serious mental illness, developmental disability, post-traumatic stress disorder, cognitive impairments resulting from a brain injury, or chronic physical illness or disability.

2. An individual living or residing in a place not meant for human habitation, a haven, or in an emergency shelter for a total of six months within a 12-month period; and has a diagnosable substance use disorder or serious mental health disorder. At the option of the state, these criteria may be expanded to include individuals with a diagnosable developmental disability,

post-traumatic stress disorder, cognitive impairments resulting from a brain injury, or chronic physical illness or disability.

3. An individual who is a victim of domestic violence who is living or residing in a place not meant for human habitation, a haven or in an emergency shelter; or (4) An individual currently living in supportive housing who has previously met the definition of chronically homeless as specified in 1 or 2 above.

○ Involved in the criminal justice system and in need of substance use or mental health treatment, defined as:

1. An individual who has complied with and substantially completed a substance use disorder treatment program while they were incarcerated in jail or prison, including Tribal jails.

2. An individual who is court ordered to receive substance abuse or mental health treatment by a district court or Tribal court.

3. An individual on probation or parole with serious mental illness and/or serious substance use disorder.

4. An individual discharged from the Utah State Hospital who was admitted to the civil unit of the hospital in connection with a criminal charge, or admitted to the forensic unit due to a criminal offense with which the individual was charged or of which the individual was convicted; or

5. Individuals involved with a Drug Court or Mental Health Court, including Tribal courts, related to a criminal charge or conviction.

○ Needing substance use or mental health treatment, defined as:

1. An individual receiving General Assistance from the Department of Workforce Services (DWS), who has been diagnosed with a substance use or mental health disorder; or

2. An individual recently discharged from the Utah State Hospital who was civilly committed.

Utah Premium Partnership - provides premium assistance to help pay the individual's or family's share of monthly premium costs of employer sponsored insurance or COBRA.

Substance Abuse Disorder in an Institution for Mental Disease (IMD) - provides authority for Medicaid recipients to receive opioid use disorder (OUD)/ SUD treatment services provided in a residential or inpatient treatment setting that qualifies as an IMD.

• Amendment #12 – On June 29, 2017, CMS approved an amendment which allows the state to provide state plan dental benefits to adults with disabilities or blindness, age 18 and

older, removed the sub-caps for enrollment of Demonstration Population I, and removed Demonstration Population II (high risk pregnant women) since changes to federal law rendered this group obsolete and it has not had individuals covered under this population since 2014.

- Amendment #13 – On October 31, 2017 (effective on November 1, 2017), CMS approved an extension that creates a new demonstration population, Targeted Adults, under which eligible beneficiaries receive state plan services. This new population is made of adults without dependent children, age 19 through 64 years of age, whose income is at zero percent of FPL. In addition, they must meet at least one of three criteria; chronically homeless, involved in the justice system and in need of substance use and mental health treatment, or those who are just in need of substance use or mental health treatment. The original evaluation design identified the chronically homeless as the priority for the evaluation. All three criterion groups will be examined for inclusion in the Summative Evaluation Report. There is an identifying marker in the Medicaid data for each of these criteria. In addition, under this approval, the state has expenditure authority to restore full mental health benefits for Current Eligibles and remove the exclusion of Norplant as a covered benefit.

- Amendment #15 – In February 2019, the state received the authority to provide comprehensive dental benefits to Targeted Adults who are receiving SUD treatment.

- Amendment #16 – In March 2019, the state received authority to provide full state plan benefits to adults without children who have incomes up to 95 percent of the FPL and the Current Eligible benefit package to adults with children who have incomes up to 95 percent of the FPL (together, these categories are known as the Adult Expansion Population) effective April 1, 2019. If the state determines that the state needs to close enrollment in this Medicaid eligibility group (MEG) due to budgetary restrictions, coverage will be closed, and no applicants will be able to enroll in this MEG until enrollment re-opens. Beneficiaries in this category who have access to ESI coverage are required to enroll in that coverage to maintain Medicaid eligibility and receive wraparound coverage. In addition, non-exempt Adult Expansion Population beneficiaries are required to complete community engagement requirements (or demonstrate good cause for failing to do so) each benefit year to be eligible for continued coverage. The evaluation of the adult expansion waiver is not being evaluated by the University of Utah. Lastly, this approval allowed the state to provide clinically managed residential withdrawal services to adult beneficiaries who reside in Salt Lake County.

- Amendment #17 – In November 2019, the state received the authority to provide intensive stabilization services (ISS) to Medicaid eligible children and youth under age 21 in state custody or those at risk of being placed in state custody who are experiencing significant emotional and/or behavioral challenges. The ISS includes state plan and home community-based services and are provided during the first eight -weeks of the intensive program on an FFS basis using a daily bundled rate. The state uses this authority to demonstrate that providing these services will reduce Emergency Room (ER) utilization, psychiatric hospitalizations, and

residential treatment services and length of stay as well as positively impact the child/youth's physical health in terms of comprehensive care.

- Amendment #18 – On December 16, 2020, the state received approval of the Serious Mental Illness (SMI) waiver plan allowing federal financial participating for beneficiaries to receive mental health treatment in Institutions of Mental Disease (IMD). The specific goal of this approval, which was effective January 1, 2021, is to maintain and enhance access to mental health services and continue delivery system improvements for these services to provide more coordinated and comprehensive treatment to Medicaid beneficiaries with serious mental illness (SMI).

CMS approved Utah's SUD evaluation design allowing the State to provide residential treatment in an IMD for all Medicaid eligible individuals. This approval was effective October 16, 2019 and is effective through June 30, 2022.

The Utah 1115 demonstration waiver has included numerous changes driven primarily by the desire to improve health care access, increase service availability to meet the needs of the various populations, and do so in a fiscally responsible way (e.g., frequently reducing beneficiary co-pays). Consistent with these primary goals, other efforts have been implemented to foster improvements in the healthcare delivery system. As a result of these frequent and numerous (and on-going) changes in the amendments in Utah, significant challenges to the evaluation have occurred. For example, the initial evaluation design for the 1115 SUD waiver included a DiD approach where substance abuse treatment in implementation counties would be compared to non-implementing comparison counties. However, due to the rapid and unexpected growth of SUD treatment services in newly established IMDs within the comparison counties, the anticipated window of data collection had to be decreased. As a result, the ability to establish an appropriate comparison group was greatly disrupted. This will require a revised analytical design for the SUD waiver moving forward, which has been included as a request in the 1115 Waiver reapplication. There are multiple population groups impacted by the demonstration.

Hypotheses and Research Questions

Table 1 maps the associated hypotheses, research questions, outcome measures, analytic approaches, and results for the various Section 1115 demonstration components.

Table 1: Summary of Demonstration Populations, Hypotheses, Evaluation Questions, Data Sources, and Analytic Approaches. **(Original 1115 Evaluation Design dated August 18, 2018)**

Demonstration Population: Current Eligibles **(CE) -** Provides a slightly reduced benefit package to adults aged 19-64 with income up to 55 percent of the FPL, who are responsible for the care of a dependent child.						
Hypothesis 1: The demonstration will not negatively impact the overall well-being, in relation to health status, of Current Eligibles who experience reduced benefits and increased cost sharing.						
Research Questions	**Measure Description**	**Numerator**	**Denominator**	**Data Source**	**Analytic Approach**	**Results**
CE 1. As members receive increased cost sharing responsibility, is the average length of enrollment affected? **CE 2.** What are the average cost share changes experienced by members? **CE 3.** How many members are diagnosed with hypertension?	Continuity of care pre to post waiver implementation given benefit reduction and increased cost sharing.	Average monthly enrollment per year per 1, 000 beneficiaries.	Average yearly enrollment per 1,000 beneficiaries.	Utah Medicaid data	Annual data: Descriptive statistics, T-test (testing for differences between the baseline period and the last post-implementation period), GEE.	CE pop. and average monthly enrollment decreased, unable to determine if average length of enrollment attributable to cost sharing*
		Current Eligibles average monthly cost share yearly over the course of the Demonstration.	Current Eligibles average yearly cost share prior to beginning of Demonstration and over the course of the Demonstration.		Annual data: Descriptive statistics, T-test (testing for differences between the baseline period and the last post-implementation period), GEE.	PMPM co-pay decreased from $5.40 (2017) to $2.36 (2020), unable to determine if attributable to cost sharing**
		Annual rate of adults with a diagnosis of hypertension and whose blood pressure was adequately controlled per 1,000.	Compared to relative national rate of adults with a diagnosis of hypertension and whose blood pressure was adequately		Annual data: Descriptive statistics, T-test (testing for differences between	The percentage of enrollees diagnosed with hypertension with antihypertensive prescriptions decreased steadily from 61% in 2017 to 48% in 2020. (47.8% vs. 48.3%; 2019 vs. 2020: p=0.86)

Post waiver implementation: **CE 4.** What were members average pharmacy benefit copays? **CE 5.** Did the average pharmacy copay effect hypertensive medication prescriptions?			controlled per 1,000.		the baseline period and the last post-implementation period), GEE.	
		Pharmacy prescriptions per member per month after copay increase. Average monthly hypertensive prescriptions per month per 1,000 beneficiaries	Pharmacy prescriptions per member per month before copay increase and over the course of the Demonstration. Average monthly hypertensive prescriptions		Monthly data: Descriptive statistics, ITS, Bayesian structural time-series (BSTS).	Average monthly prescription co-pays were relatively stable but decreased over 10% from $5.61 to $5.04 from 2017 to 2020. With a significant decrease from $5.04 to $2.38 from 2019 to 2020. Sig. ($p<0.01$) Mean hypertensive pharmacy prescriptions steadily declined about 15% during the period from 2017 to 2019 and then remained at a similar level in 2020. (2019 vs. 2020: $p<0.01$) Unable to determine if average co pay affected hypertensive Rx***

			per month before copay increase and over the course of the Demonstration.			
Demonstration Population: **Primary Care Network (PCN) -** Provides a limited package of preventive and primary care benefits to previously uninsured adults aged 19-64, with income up to 95 percent FPL.						
Hypothesis 2a: The demonstration will improve well-being in Utah by reducing the number of Utahns without coverage for primary health care.						
Research Questions	**Measure Description**	**Numerator**	**Denominator**	**Data Source**	**Analytic Approach**	**Results**
PCN 6. What is the difference between the percentages of Utah's uninsured adults in poverty compared to the National average?	Reduce the number of uninsured.	Rate of uninsured adults in poverty in Utah, per 1,000.	National average of uninsured adults in poverty, per 1,000.	BRFSS	Annual data: Descriptive statistics, Proportional test.	Ave. Utah % uninsured adults in poverty (FPL 0-100%) fluctuated during 2016-2019; 35.9% in 2018 vs. 36.8% in 2019, NS (p=0.84). National BRFSS data was not available at the time of evaluation.
Hypothesis 2b: The demonstration will improve well-being in Utah by improving PCN members' access to primary care.						
Research Questions	**Measure Description**	**Numerator**	**Denominator**	**Data Source**	**Analytic Approach**	**Results**
PCN 7. What is the difference between the quality of primary care access between Utah's PCN compared to other Utah covered groups	Improve access to primary care. CAHPS quality indicators	Utah percentage satisfaction with getting timely appointments, Care, and Information; How Well Providers	National percentage satisfaction with getting timely appointments, Care, and Information; How Well Providers	Utah Medicaid data	Annual data: Descriptive statistics, Chi-square test (testing for differences between the baseline period and the last post-implementation period).	CAHPS data is not available for evaluation for this specific population

and the National average? **PCN 8.** How many members are diagnosed with hypertension?	HEDIS Adult	Communicate with Patients; and Access to Specialists.	Communicate with Patients; and Access to Specialists.		CAHPS data is not available for evaluation for this specific population. Quarterly data: Descriptive statistics, ITS, Bayesian structural time-series (BSTS).		
			Annual rate of adults with a diagnosis of hypertension and whose blood pressure was adequately controlled per 1,000.	Compared to relative national rate of adults with a diagnosis of hypertension and whose blood pressure was adequately controlled per 1,000.			Improved access to hypertension diagnosis and treatment (14.9% to 16.8%) during 2017-2018 (p-value<0.01). Percent of patients with antihypertensive prescriptions did not change statistically (56.56% in 2017 vs. 57.04% in 2018: p-value=0.67). In 2019, all subjects had 9 months enrollment as maximum, so the numbers were not calculated.
Hypothesis 3: The demonstration will reduce the number of unnecessary visits to emergency departments by PCN members.							

Research Questions	Measure Description	Numerator	Denominator	Data Source	Analytic Approach	Results
PCN 9. How do emergency department utilization rates differ among PCN Adults with Children, PCN Childless Adults, and Current Eligible members? **PCN 10.** What differences in non-emergent ED utilization exist between PCN members and parents?	Reduce non-emergent ER visits	Emergency department (ED) utilization per PCN member over the course of the members' enrollment.	Emergency department (ED) utilization per PCN member in first year of enrollment.	Utah Medicaid data	Quarterly data: Descriptive statistics, ITS, Bayesian structural time-series (BSTS).	ED utilization was lower among PCN enrollees with children compared to those without (20.66 in 2019 vs. 46.01 in 2019). ED utilization is higher among CE than PCN (86.70 in 2019 vs. 37.23 in 2019). Sig. ($p<0.01$)
		Non-Emergent ED utilization per PCN member at year 2,3,4,5 over the course of the member's enrollment. Percent of average monthly ED visits without a qualifying diagnosis (non-emergent).	Non-Emergent ED utilization per PCN member in first year of enrollment. Percent of annual ED visits without a qualifying diagnosis (non-emergent).		Quarterly data: Descriptive statistics, ITS, Bayesian structural time-series (BSTS). Quarterly data: Descriptive statistics, ITS, Bayesian structural time-series (BSTS).	Non-emergent ED utilization increased for PCN (11.79 in 2017 to 15.96 in 2019), due to significant increase among those without children. Non-emergent ED utilization among CE was 3 times higher than PCN (60.20 in 2019 vs. 15.96 in 2019).
Demonstration Population – UPP Enrollees. Previously uninsured parents and adults without dependent children, and CHIP children who use the premium subsidy to enroll in private, employer-sponsored health insurance or COBRA.						
Hypothesis 4: The demonstration will assist previously uninsured individuals in obtaining employer-sponsored health insurance.						

Research Questions	Measure Description	Numerator	Denominator	Data Source	Analytic Approach	Results
UPP 11. How many additional UPP members' insurance premiums were paid each year?	Increasing the number of uninsured who obtain employer-sponsored health insurance.	Number of members receiving assistance obtaining employer-sponsored health insurance at year 2,3,4,5 (yearly over the course of the Demonstration)	Number of members receiving assistance obtaining employer-sponsored health insurance at year 1 (beginning of Demonstration)	Utah Medicaid data	Annual data: Descriptive statistics.	Decrease in total enrollment and enrollment month (2017-2019): unique members in 2017 vs. 2019: 780 subjects vs. 615 subjects average enrollment months in 2017 vs. 2019: 7.97 vs. 7.88
UPP 12. What percent did member's insurance premium was paid each year (adjusting for inflation)?	Reduce the number of false claims for assistance.	Percent of assistance provided for members at year 2,3,4,5 (yearly over the course of the Demonstration)	Percent of cost of assistance provided for members at year 1 (beginning of Demonstration) .		The member's insurance premium information is not available from the Medicaid data.	Insurance premium information not available at time of reporting.
UPP 13. What is the per household member cost?		Per household member cost of assistance at year 2,3,4,5 (yearly over the	Per household member cost of assistance at year 1 (beginning of Demonstration)		The household information of each member is not available from the Medicaid data.	Household information is not available.

UPP 14. What is the total number and percentage being denied subsidy assistance?		course of the Demonstration) Average monthly number and percentage of those being denied subsidy assistance at year 2,3,4,5 (yearly over the course of the Demonstration)	Average monthly number and percentage of those being denied subsidy assistance at year 1 (beginning of the Demonstration)		The denied subsidy assistance is not available from the Medicaid data.	Denied subsidy assistance information is not available at time of reporting. Note: Insurance information and subsidy assistance information *may* be available for the summative report, depending on the status of the ongoing PHE.
Demonstration Population – Targeted Adults **(TA)**. Provides state plan Medicaid benefits to a targeted group of adults, age 19-64 without dependent children with income at zero percent FPL, who meet at least one of three criteria: chronically homeless, involved in the justice system and in need of substance use or mental health treatment, or just in need of substance use or mental health treatment.						
Hypothesis 5: The demonstration will reduce the number of uninsured Utahns.						
Research Questions	**Measure Description**	**Numerator**	**Denominator**	**Data Source**	**Analytic Approach**	**Results**
TA 15. How many new members are covered under this demonstration who were previously ineligible?	Reduce the number of uninsured from among chronically homeless, criminal justice system-involved, in need of substance	Average monthly number members receiving assistance at year 2,3,4,5 (yearly over the course of the Demonstration) .	Average monthly number of members receiving assistance at year 1 (beginning of the Demonstration)	Utah Medicaid data	Annual data: Descriptive statistics, T-test (testing for differences between the baseline period and the last post-implementation period), GEE.	TA enrollment more than tripled 2018-2020 (2835 subjects in 2018 vs. 8517 subjects in 2020).

	abuse or mental health services.	Rate of uninsured adults in poverty in Utah, per 1,000.	National average of uninsured adults in poverty, per 1,000.	BRFSS	Annual data: Descriptive statistics, Proportional test.	Ave. Utah % uninsured adults in poverty (FPL 0-100%) fluctuated during 2016-2019; 35.9% in 2018 vs. 36.8% in 2019, NS (p=0.84). National BRFSS data not available for this specific population at the time of evaluation.
Hypothesis 6: The demonstration will improve access to primary care, while also improving the overall health status of the target population.						
Research Questions	**Measure Description**	**Numerator**	**Denominator**	**Data Source**	**Analytic Approach**	**Results**
TA 16. What changes to primary care access occurred as a result of the Demonstration?	HEDIS Adult Core Set	Annual Utah rate of adults with a smoking diagnosis per 1,000 at year 2,3,4,5 (yearly over the course of the Demonstration)	Annual Utah rate of adults with a smoking diagnosis per 1,000 at year 1 (beginning of the Demonstration)	Utah Medicaid data	Quarterly data: Descriptive statistics, ITS, Bayesian structural time-series (BSTS).	TA with a smoking diagnosis and cessation treatment (primary care visit) increased from 34% to 42% from 2018 to 2019 ($p<0.01$), then slightly declined to 39% in 2020 ($p<0.01$).
TA 17. What were the costs associated with smoking diagnosis,		Annual Utah rate of adults with a smoking diagnosis (Preventive	Annual Utah rate of adults with a smoking diagnosis (Preventive		Quarterly data: Descriptive statistics, ITS, Bayesian structural time-series (BSTS).	

antidepressant medication management, and preventive care visits?		Care Screening: Tobacco Use: Screening and Cessation) per 1,000 at year 2,3,4,5 (yearly over the course of the Demonstration)	Care Screening: Tobacco Use: Screening and Cessation) per 1,000 at year 1 (beginning of the Demonstration)			
		Annual Utah rate of adults with antidepressant medication management per 1,000 at year 2,3,4,5 (yearly over the course of the Demonstration) Annual Utah rate of adults with a preventive care visit per 1,000 Average cost per member at year 2,3,4,5 over the course	Annual Utah rate of adults with antidepressant medication management per 1,000 at year 1(beginning of Demonstration). Annual National rate of adults with a preventive care visit per 1,000 Average cost per member in first year of enrollment for smoking diagnosis,		Quarterly data: Descriptive statistics, ITS, Bayesian structural time-series (BSTS). Quarterly data: Descriptive statistics, ITS, Bayesian structural time-series (BSTS).	The number of TA enrollees with antidepressant medication quadrupled from 222 to 829 from 2018 to 2020. Management improved for this population despite the increase in numbers. Those with acute phase treatment increased from 56% to 74% ($p<0.01$) over the same period, while those with effective continuous treatment increased from about 23% to 47% (<0.01). Preventive care visits increased from 49% to 57%, 2018-2020 ($p<0.01$). TA costs associated with smoking diagnosis, antidepressant med. and preventive care visits increased significantly. Average cost of smoking diagnosis per member increased from $23.38 in 2018-2020 ($p<0.01$). Average cost of antidep. med. management per member increased from $8.67 in 2018 to $20.21 in 2020 ($p<0.01$). Average preventive care cost per visit increased from

		of the member's enrollment for smoking diagnosis, anti-depressant medication management, and preventive care visit.	anti-depressant medication management, and preventive care visit.			$344 in 2018 to $440 in 2020 ($p<0.01$).
Hypothesis 7: The demonstration will reduce the number of non-emergent Emergency Room visits for the chronically homeless population.						
Research Questions	**Measure Description**	**Numerator**	**Denominator**	**Data Source**	**Analytic Approach**	**Results**
TA 18. To what extent were non-emergent ED visits reduced?	Reduce non-emergent ER visits	Percent of average monthly ED visits without a qualifying diagnosis (non-emergent) at year 2,3,4,5 (yearly over the course of the Demonstration)	Percent of annual ED visits without a qualifying diagnosis (non-emergent) at year 1 (beginning of Demonstration) .	Utah Medicaid data	Quarterly data: Descriptive statistics, ITS, Bayesian structural time-series (BSTS).	Non-emergent ED visits slightly increased from 20% in 2018 to 21% in 2020.
TA 19. Did the costs associated with the ED visits decrease at year 1 (beginning of Demonstration)?		Average monthly cost of ED visits at year 2,3,4,5 (yearly over the course of the Demonstration)	Average monthly cost of ED visits at year 1 (beginning of the Demonstration) .		Quarterly data: Descriptive statistics, ITS, Bayesian structural time-series (BSTS). Annual data: Descriptive statistics.	Average monthly ED cost per visit remained stable 2018-2020 ($81.32 in 2018 vs. $81.95 in 2020).

TA 20. What were the health care procedures provided by emergency departments?		Most frequently experienced diagnoses in emergency departments by chronically homeless members, the associated costs, and changes over time.				Top 5 diagnoses (based on primary diagnosis only) for ED visits in 2020: 1. Suicidal ideation 2. Alcohol abuse/intox. 3. Chest pain 4. Unspecified chest pain 5. Unspecified abdominal pain The top 5 diagnoses are similar by rank across the three years, but not identical. Costs associated with alcohol abuse with intoxication were highest in 2018 ($10,942), and suicidal ideations were the costliest primary diagnosis in 2019 ($25,431) and 2020 ($12,366).
Hypothesis 8: The demonstration will reduce uncompensated care (**UC**) provided by Utah hospitals.						
Research Questions	**Measure Description**	**Numerator**	**Denominator**	**Data Source**	**Analytic Approach**	**Results**
UC 21. To what extent were costs associated with uncompensated care in Utah hospitals reduced by the Demonstration?	Reduce uncompensated care costs	Total cost of uncompensated care provided at year 1, 2,3,4,5 (yearly over the course of the Demonstration)	Total cost of uncompensated care prior to Demonstration.	Hospital Costs Reports	Annual data: Descriptive statistics.	Clear reduction 2018-2019 ($200,173,232 vs. $181,861,938), slight increase 2019-2020 ($181,861,938 vs. $182,368,112) (coincided with Med. expansion)
Demonstration Population – Blind and Disabled Dental **(BDD)** - Adults aged 18 and older who have blindness or a disability who receive a state plan dental benefit.						

Hypothesis 9: The demonstration will reduce the number of individuals who have an emergency dental procedure performed, while increasing the number of members who have a preventive dental service.						
Research Questions	**Measure Description**	**Numerator**	**Denominator**	**Data Source**	**Analytic Approach**	**Results**
BDD 22. To what extent did member ED dental procedures decrease as a result of the Demonstration? **BDD 23.** What were the costs associated with these emergency dental procedures? **BDD 24**. To what extent did member preventive dental services increase because of the Demonstration?	Improve preventive dental services and reduce emergency dental procedure costs.	Percent of ED dental services in year 2,3,4,5 (yearly over the course of the Demonstration)	Percent of ED dental services in year 1 (beginning of the Demonstration)	Utah Medicaid data	Quarterly data: Descriptive statistics, ITS, Bayesian structural time-series (BSTS).	Increased number of dental and emergency dental visits (18.79% in 2018 vs. 1915% in 2020), despite reduction in enrollment, 2018-2020.
		Average monthly ED dental care cost per Blind/Disabled Adult member at year 2,3,4,5 over the course of the member's enrollment.	Average monthly ED dental care cost per Blind/Disabled Adult member in the member's first year of enrollment.			Average monthly emergency dental care costs increased from $1.38 to $1.76 over the period.
		Annual Utah rate of members with a preventive dental care visit per 1,000	Annual National rate of adults with a preventive care visit per 1,000			Average monthly emergency dental care costs increased from $11.18 to $15.56 from 2017 to 2020.

BDD 25 What were the per capita costs associated with these preventive dental services?		Average monthly preventive dental care cost per Blind/Disabled Adult member at year 2,3,4,5 over the course of the member's enrollment.	Average monthly preventive dental care cost per Blind/Disabled Adult member in the member's first year of enrollment.			Average monthly preventive dental care costs increased from $11.81 to $14.12 (2018-2020).

Table 2 below maps the new associated hypotheses, research questions, outcome measures, analytic approaches based on the revised SUD Evaluation Design (submitted to CMS 8/31/2021).

Table 2. Summary of Demonstration Populations, Hypotheses, Evaluation Questions, Data Sources, and Analytic Approaches for the SUD component of the 1115 Waiver.

Evaluation Question: Does the demonstration increase access to and utilization of SUD treatment services?					
Demonstration Goal: Increased rates of identification, initiation, and engagement in treatment for SUDs. **Evaluation Hypothesis: The demonstration will increase the percentage of members who are referred and engage in treatment for SUDs.**					
Driver	**Measure Description**	**Numerator**	**Denominator**	**Evaluation Period**	**Analytic Approach /Target or Comparison Population**
Primary Driver *(Increase the rates of initiation and engagement in treatment for SUDs)*	**IET 1.** Initiation and Engagement of Alcohol and Other Drug Dependence Treatment	Initiation: number of patients who began initiation of treatment through an inpatient admission, outpatient visits, intensive outpatient encounter or partial hospitalization	Patients who were diagnosed with a new episode of alcohol or drug dependency during the first 10 and ½ months of the measurement year	Calendar years 2016(Pre) 2017(Interim) 2018-2022(Post) Retrospectively changing the metric to	Descriptive statistics (frequencies and percentages); Linear regression. **I**nterrupted time series (ITS) design will be used.

		within 14 days of the index episode start date Engagement: Initiation of treatment and two or more inpatient admissions, outpatient visits, intensive outpatient encounters or partial hospitalizations with any alcohol or drug diagnosis within 30 days after the date of the initiation encounter		monthly (from annually)	

Driver	**Measure Description**	**Numerator**	**Denominator**	**Evaluation Period**	**Analytic Approach /Target or Comparison Population**
Secondary Drivers *(Enhance provider and plan capabilities to screen/identify patients for engagement and intervention; Improve community knowledge of available treatment and services)*	**TR-AVAIL 1.** Community knowledge of available treatment and services	Beneficiary survey Adult SUD consumer satisfaction questions	NA	State fiscal year 2020-2022	Descriptive statistics (Frequencies and percentages); t-test. Target population: SUD members. Comparison population. Annual survey of Medicaid members receiving SUD services. Survey findings are compared between respondents in 2020, 2021, and 2022 survey.
Demonstration Goal: Increased adherence to and retention in treatment for SUDs. **Evaluation Hypothesis: The demonstration will increase the percentage of members who adhere to treatment of SUDs.**					
Driver	**Measure Description**	**Numerator**	**Denominator**	**Evaluation Period**	**Analytic Approach /Target or Comparison Population**
Primary Drivers *(Increase the rates of initiation and*	**SUD-MAT 1.** Continuity of	Number of members who have at least 180 days of continuous	Members who had a diagnosis of OUD and at least one claim	Calendar years 2016(Pre) 2017(Interim)	Descriptive statistics (Frequencies and percentages)

engagement in treatment for OUD and SUDs; Improve adherence to treatment for SUDs)	Pharmacotherapy for OUD Percentage of members with a SUD diagnosis including those with OUD who used services per month	pharmacotherapy with a medication prescribed for OUD without a gap of more than seven days Number of members who receive a service during the measurement period by service type	for an OUD medication Number of members	2018-2022(Post) First year of waiver is baseline compared to years 2 through 5 of the waivers.	Pre-post waiver analysis with logistic regression Target population: SUD members receiving MAT

Driver	**Measure Description**	**Numerator**	**Denominator**	**Evaluation Period**	**Analytic Approach /Target or Comparison Population**
Secondary Drivers *(Increase access to outpatient, intensive outpatient, and residential treatment for SUD; Improve care coordination and transitions between levels of care)*	**SUD-TL 1.** Length of engagement in treatment	Number of members completing 4th treatment session within 30 days	Number of members receiving treatment	First year of waiver is baseline compared to years 2 through 5 of the waivers. Retrospectively changing the metric to monthly (from annually)	Interrupted time series (ITS) design will be used.
Secondary Driver *(Ensure patients are satisfied with services*	**SUD-UX 1.** Patient	Beneficiary survey Adult SUD consumer satisfaction questions	N/A	State fiscal year 2020-2022	Descriptive statistics (Frequencies and percentages); t-test.

	experience of care				Target population: SUD members. Comparison population. Annual survey of Medicaid members receiving SUD services. Survey findings are compared between respondents in 2020, 2021, and 2022 survey.
Increase the rates of successfully completing treatment for SUDs	Treatment completion	Number of patients completing treatment	Total number of patients treated	Yearly	Descriptive statistics Pre-post waiver analysis with logistic regression Comparison population Propensity score matching (PSM) to create comparison group (matched) population of others receiving treatment through publicly funded SUD systems.
Increase the rates of successfully completing treatment for SUDs	Returning to treatment	Number of patients re-admitting to treatment after completing or dropping out	Total number of patients treated	Yearly	Descriptive statistics Pre-post waiver analysis with logistic regression Comparison population Propensity score matching (PSM) to create comparison group (matched) population of others receiving treatment through publicly funded SUD systems.
Demonstration Goal: Reduced utilization of emergency department and inpatient hospital settings for treatment where the utilization is preventable or medically inappropriate through improved access to other continuum of care services. **Evaluation Hypothesis: The demonstration will decrease the rate of emergency department and inpatient visits within the beneficiary population for SUD.**					
Driver	**Measure Description**	**Numerator**	**Denominator**	**Evaluation Period**	**Analytic Approach /Target or Comparison Population**

Primary Drivers *(Reduced utilization of emergency department and inpatient hospital settings for SUD treatment)*	**SUD-ED 1.** Follow-up after emergency department visit for alcohol and other drug abuse or dependence **SUD-IP 1.** Inpatient admissions for SUD and specifically OUD	An outpatient visit, intensive outpatient encounter or partial hospitalization with any provider with a primary diagnosis of alcohol or other drug dependence within 7/30 days after emergency department discharge Number of members with and inpatient admission for SUD and specifically OUD	Members treated and discharged from an emergency department with a primary diagnosis of alcohol or other drug dependence in the measurement year/1000-member months Total number of members/1000-member months	Calendar years 2016(Pre) 2017(Interim) 2018-2022(Post)	Descriptive statistics (frequencies and percentages); Linear regression. Target population: SUD members with OUD diagnosis. Interrupted time series (ITS) design will be used.

Evaluation Question: Do members receiving SUD services experience improved health outcomes?					
Demonstration Goal: Improved access to care for co-morbid physical health conditions commonly associated with SUD among members. **Evaluation Hypothesis: The demonstration will increase the percentage of members with SUD who experience care for comorbid conditions.**					
Driver	**Measure Description**	**Numerator**	**Denominator**	**Evaluation Period**	**Analytic Approach /Target or Comparison Population**
Improve access to care for co-morbid physical health conditions among beneficiaries with SUD	**SUD-HC 1.** Number of routine office visits by people with SUD	Number of members with a SUD diagnosis, and specifically those with OUD, who access physical health care.	Total number of members	First year of waiver is baseline compared to years 2 through 5 of the waivers	Descriptive statistics (frequencies and percentages); Linear regression. Target population: SUD members with OUD diagnosis. Interrupted time series (ITS) design will be used.
Increased initiation and engagement for treatment	Alcohol use by patients	Patients with alcohol use Abstinence (Percent Increase): (Percent abstinent at discharge	Total number of patients	Admission to discharge	Descriptive statistics Pre-post waiver analysis with logistic regression

		minus percent abstinent at admission) divided by percent abstinent at admission			Comparison population Propensity score matching (PSM) to create comparison group (matched) population of others receiving treatment through publicly funded SUD systems.
Increased initiation and engagement for treatment	Drug use by patients	Abstinence (Percent increase): (Percent abstinent at discharge minus percent abstinent at admission) divided by percent abstinent at admission	N/A	Admission to discharge	Descriptive statistics Pre-post waiver analysis with logistic regression Comparison population Propensity score matching (PSM) to create comparison group (matched) population of others receiving treatment through publicly funded SUD systems.
Increased initiation and engagement for treatment	Opioid use by patients	Abstinence (Percent increase): (Percent abstinent at discharge minus percent abstinent at admission) divided by percent abstinent at admission	N/A	Admission to discharge	Descriptive statistics Pre-post waiver analysis with logistic regression Comparison population Propensity score matching (PSM) to create comparison group (matched) population of others receiving treatment through publicly funded SUD systems.
Improved screening and integration of physical health care	Tobacco use by patients	Abstinence (Percent increase): (Percent abstinent at discharge minus percent abstinent at admission) divided by percent abstinent at admission	N/A	Admission to discharge	Descriptive statistics Pre-post waiver analysis with logistic regression Comparison population Propensity score matching (PSM) to create comparison group (matched) population of

					others receiving treatment through publicly funded SUD systems.

Evaluation Question: Are rates of opioid-related overdose deaths impacted by the demonstration?					
Demonstration Goal: Reduction in overdose deaths, particularly those due to opioids. **Evaluation Hypothesis: The demonstration will decrease the rate of overdose deaths due to opioids.**					
Driver	**Measure Description**	**Numerator**	**Denominator**	**Evaluation Period**	**Analytic Approach /Target or Comparison Population**
Reduce opioid-related opioid overdose deaths	**OD 1.** Rate of overdose deaths, specifically overdose deaths due to any opioid	Number of overdose deaths per month and per year	Number of members/1000	First year of waiver is baseline compared to years 2 through 5.	Descriptive statistics (Frequencies and percentages); t-test.

***Additional multivariate analysis required. **Adjustment required for severity of hypertension. ***Further analysis required.**

The numbering system included in Table 1 above links the associated demonstration hypothesis, research questions, together with design, analysis, and results.

There were several hypotheses to be addressed by each major Waiver component.

Current Eligibles (CE)

For the current eligible population, cost-sharing was increased, and benefits were slightly reduced. The associated hypothesis related to that change to be tested was that:

> Hypothesis CE1: The decline in benefits and increase in cost-sharing would not adversely affect the health of enrollees.

This hypothesis is tested by focusing on hypertension. Changes in rates of hypertension diagnosis among the enrollee population and in use of hypertensive medication and number of such prescriptions per month were examined. Overall use of prescriptions was also examined as were the aggregate and per capita amounts of co-pays made.

Primary Care Network (PCN)

The PCN was conceived to extend a limited amount of preventive and primary care benefits to uninsured adults aged 19-64 years of age up to 95% of the poverty line. The two hypotheses, the first broken into two sub-hypotheses, to be examined associated with the PCN:

> Hypothesis PCN2a: The PCN will reduce the number of Utahns without coverage for primary care.
> Hypothesis PCN2b: The PCN will increase primary care utilization among the covered population.
> Hypothesis PCN3: The PCN will reduce the number of non-emergent emergency department (ED) visits by PCN members.
> Hypothesis PCN2a: The PCN will reduce the percentage of the Utah adult population in poverty without insurance.
> Hypothesis PCN2b: The PCN will improve care by increasing timely appointments and improve how well providers communicate with patients. Rates of patients with blood pressure controlled will also increase.
> Hypothesis PCN3: The PCN will decrease non-emergent ED utilization.

Given that the PCN was suspended at the end of March 2019, the data provided here cover only through that period, which was provided as well in the mid-point evaluation.

Utah Premium Partnership (UPP)

UPP was created to incentivize otherwise Medicaid-eligible adults and their children to enroll either in employer-sponsored insurance (ESI) or COBRA when available through premium assistance. The single hypothesis to be examined was:

> Hypothesis UPP4: There would be new take-up of ESI and the cost to the state would be moderate.

This hypothesis would be examined based on the number of new enrollees in UPP, the number denied assistance under UPP, and the percentage and amount of assistance paid by the state.

Targeted Adults (TA)

TA demonstration was designed to assist poor adults who were homeless, involved in the criminal justice system or contending with substance abuse and/or mental illness disorders in obtaining Health care access. There were four hypotheses attendant to the demonstration to be examined:

> Hypothesis TA5: The demonstration will reduce the number of uninsured in Utah.
>
> Hypothesis TA6: The demonstration will increase access to primary health care and improve enrollees' health.

Hypothesis TA7: The demonstration would reduce the use of non-emergent ED use.
Hypothesis TA8: The demonstration would reduce the amount of uncompensated care at Utah hospitals.

Hypothesis TA5 is tested by examining the number of new enrollees in the program and the rate of not being insured among the population in poverty. Hypothesis TA6 is tested by examining satisfaction among enrollees in obtaining appointments for timely care, and in the communication received from providers. Also examined, would be the number of enrollees receiving a smoking or depression diagnosis and cessation treatment or antidepressant medication for those diagnoses, respectively. Also examined would be the amount of preventive care visits received by enrollees.

Hypothesis TA7 is tested by examining facets of ED visits: the number of ED visits per enrollees, the number of non-emergent ED visits, and the diagnoses attached to the most frequently experienced ED visits. The cost attendant to ED care is also examined. Hypothesis TA8 is tested by examining the total amount of uncompensated care provided by hospitals before and after the demonstration.

Blind and Disabled Dental (BDD)

The BDD demonstration was generated to provide access to dental care for the blind or disabled adult population. There is one hypothesis attendant to the demonstration:

Hypothesis BDD9: The demonstration will reduce emergency dental care and increase the amount of preventive dental care.

Hypothesis BDD9 is tested by examining the percent of dental visits that are classified as emergency visits, and by the number of enrollees that had a preventive dental care visit and the number of such visits per enrollee. Costs of emergency and preventive dental care are also examined.

Substance Use Disorder (SUD)

Hypothesis SUD10: The percentage of members who are referred and engage in treatment for SUDs will increase.
Hypothesis SUD11: The percentage of members who adhere to treatment of SUDs will increase.
Hypothesis SUD12: The rate of emergency department and inpatient visits will decrease.
Hypothesis SUD13: The percentage of members with SUD who experience care for comorbid conditions will increase.
Hypothesis SUD14: The demonstration will decrease the rate of overdose deaths due to opioids.

Targeted Adult Medicaid (TAM) Dental

Hypothesis TA15: Individuals receiving comprehensive dental treatment will have a higher rate of SUD treatment completion.

Clinically Managed Residential Withdrawal Services

Hypothesis CM16: The number of individuals receiving emergency department services for substance use disorder will decrease in waiver implementing counties.
Hypothesis CM17: ED expenditures will decrease for substance use disorder services in implementing counties.
Hypothesis CM18: Inpatient hospitalization days for SUD services will decrease in waiver implementing counties.
Hypothesis CM19: Outpatient (OP), intensive outpatient (IOP), or partial hospitalization visits for SUD services will increase in Salt Lake County.
Research Question CM20: Will the number of beneficiaries who utilize withdrawal management services increase in implementing counties?

Methodology

CMS approved the section 1115 demonstration evaluation design (see Attachment C) on October 16, 2019. The research conducted to evaluate the demonstration in this report complied with the approved evaluation design. The design methodology was based on the hypotheses to be tested, the type of outcome to be evaluated, and on the availability of data to appropriately address the hypotheses. These decisions were made in response to the theoretical relationships identified in the driver diagram included in the evaluation design and which helped identify the short-term, intermediate, and long-term outcomes to be measured. Additionally, the driver diagram considered potential mediating factors that may influence the ability of the waiver strategies to impact outcomes and confounding variables that may bias evaluation results if not controlled for.

The methodology for testing the hypotheses was mainly single-year pre- and post- assessment (two- year) of the demonstrations, 2017-2019. Due to limited observations and period, this single two-year assessment was restricted to summary statistics and p-value tests for significance from the base (pre-demonstration) year to the two subsequent years. A preponderance of p-value tests indicated significant differences on a two-tailed test, but the very large sample sizes assured that this would be the case. The slight differences in summary outcomes from pre- and post-intervention were, for the most part, clinically insignificant. The methods sections seek to provide a detailed description of the beneficiary survey and providing supporting description of the BRFSS, as well as potential limitations to using this data.

Most data related to diagnoses and reimbursements were taken from Medicaid claims. Other data sources include the Healthcare Effectiveness Data and Information Set (HEDIS), the Utah

Behavioral Risk Factor Surveillance System (BRFSS), enrollee lists provided by UDOH, and CMS published lists of definitions and codes. A specific listing of type of measure and codes associated with each demonstration population, outcomes and measures is included in the Attachment D.

The selected SUD design was developed based on established guidance,[4] specifically noting "a preferred approach would be to conduct difference-in-differences analysis (DiD) to compare trends for those affected by the SUD demonstration with beneficiaries not affected by the demonstration during the observation period due to the demonstration's geographic focus." Other sources identified in the literature supported both the strength and rigor of the DiD design, indicating the design has been shown to be a good evaluation design for intervention studies including Medicaid Demonstrations.[5]

In addition to utilizing Medicaid claims data to address the hypotheses in the waiver, the evaluator subcontracted with Qualtrics to purchase a Utah Medicaid panel of beneficiaries. The online survey focused on answering specific questions related to beneficiary access, utilization, and experience with SUD services. Specific survey responses were used to answer research questions related to the primary waiver hypotheses. Survey response data were analyzed with descriptive statistics.

TAM Dental

Due to the changing and unique target population groups included in the demonstration, a quasi-experimental design approach will be implemented in the independent evaluation. A single interrupted time series (SITS) design will be used to evaluate the new dental benefit change for Targeted Adults (TAM) receiving Substance Use Disorder (SUD) services.

Clinically Managed Residential Withdrawal Services

The approved evaluation design specified that the evaluation would use an interrupted time series or a DiD approach to the analysis. As the metrics for this component are measured monthly, there were sufficient time points before and after the implementation to use a comparative interrupted time series (CITS) approach to compare outcomes in the target group (Salt Lake County) with the comparison group (all other Utah Counties). DiD designs are a simplification of CITS that tests for the pre-post differences in means between the treatment and comparison groups. CITS is a more rigorous design6 in that the use of multiple time points before and after the intervention allows for analysis of differences from baseline trends in addition to baselines means. Therefore, if there are sufficient time points, a CITS design is preferable to the simpler difference in difference design. CITS is also preferable to a single group interrupted time series design (ITS) in that the addition of a comparison group helps to address common threats to internal validity in ITS designs such as history and selection if the threats operate similarly across the two groups. Within study comparisons, CITS designs have been demonstrated to show comparable results to randomized control trials.[6]

Evaluation Design

The SUD design focused on DiD approach, a quasi-experimental before and after intervention design, to compare the SUD residential treatment service expansion in the target group (Salt Lake and Utah Counties) with the comparison group (Davis, Weber, and Washington counties). Logistic regression was used to compare the differences between the groups before and after service expansion.

The independent evaluator contracted with an experienced national survey vendor to conduct a cross sectional survey of Medicaid beneficiaries in the spring of 2020. This approach will allow group-level outcome comparisons at various times to understand how a demonstration's effects change over time. The survey included standardized questions and composite question scales from the BRFSS, CAHPS® and CAHPS® Experience of Care and Health Outcomes (ECHO) Survey[7], which asks health plan enrollees about their experiences with health care services, including behavioral health care services.

The questions have been validated for patients and family members with a wide range of service needs, including those with SUD. Specific ECHO Survey quality measures of patient experience include getting treatment quickly and overall rating of counseling and treatment. The getting treatment quickly measure is also included in the core CAHPS Health Plan Survey, while the rating of counseling and treatment is a unique question from the CAHPS ECHO Survey.

SUD Evaluation Period

The timeline for the evaluation includes the year 2016 and the time-period after the expansion includes the year 2018. The year 2017 was excluded from analysis as it was a partial implementation year (the waiver demonstration expansion began in November 2017). Data from 2019 was not used because comparison sites began service expansion beginning that year and no longer qualify as a comparison group. Consequently, for the purpose of this design, there is only one available year of comparison data for the difference-in-differences design. Table 3 shows the number of IMD providers implemented by year in each of the counties included in the study. There were five that started in 2017, three that started in 2018, and five in 2019.

Table 3. Number of New IMD Providers by Year.

	2017	2018	2019
Salt Lake	4	2	0
Utah	1	1	3
Davis	0	0	1
Washington	0	0	1
Weber	0	0	0

The beneficiary survey was designed to be conducted in 2020, 2021, and 2023.

For clinically managed residential withdrawal services, the baseline period before the amendment spans from November 2015 to March 2019 and the time after the amendment includes the time-period after implementation until June 2020 for the current report. TAM dental was implemented on March 1, 2019, and clinically managed residential withdrawal services was implemented on May 1, 2019.

Target and Comparison Populations

The SUD target population included any Medicaid beneficiary residing in a county that began provision of IMD residential facilities in 2018 (Salt Lake and Utah). The comparison population included any Medicaid beneficiary residing in a county that did not have IMD residential facilities during 2018 (Davis, Weber, and Washington). Table 4 below summarizes the target and comparison populations and those that have been diagnosed with SUD. The comparison sites began provision of IMD residential facilities in 2019 so the analysis can only look at 2018 for comparison.

TAM dental service expansion was implemented uniformly across the state so there are no specific comparison populations available. However, the TAM population receiving SUD treatment with comprehensive dental care will be compared to those receiving SUD treatment without comprehensive dental care. Clinically managed residential withdrawal services were implemented in Salt Lake County, so all other counties serve as a comparison population for the analysis (see Table 4 below of the counties included). Medicaid beneficiaries that moved or received services outside of their specified target or comparison counties were removed from the analysis. In addition, Medicaid beneficiaries in the Primary Care Network (PCN) program, or a part of the emergency only population were removed from the analysis due to limitations in their service coverage. Targeted Adult Medicaid beneficiaries were removed because that demonstration did not exist prior to the SUD demonstration. Graphs with and without these groups showed the same distributions which determined that the removal of these groups did not significantly change the characteristics of the population.

Table 4. Summary of Medicaid beneficiaries with a SUD diagnosis.

Counties w/ IMD Expansion	County Population	# Of clients w/ SUD	Percentage
Salt Lake	228,222	18,729	8.21%
Utah	111,997	5,239	4.68%
Counties w/ No Expansion			
Davis	51,361	3,005	5.85%
Washington	37,850	1,759	4.65%
Weber	59,886	5,154	8.61%

Evaluation Measures

The measures used in the SUD evaluation included nationally standardized data collection protocols such as Initiation and Engagement of Alcohol and Other Drug Dependence Treatment (NFQ #0004) and Continuity of Pharmacotherapy for OUD (NQF #3175). The specific measures and their modifications are listed in Table 5 below.

Table 5. Description of Measures of their Modifications.

Measure Description	**Steward**	**Numerator**	**Denominator**	**Modification**
Initiation of alcohol and other drug dependence treatment	NQF #0004	Members who began initiation of treatment through an inpatient admission, outpatient visits, intensive outpatient encounter or partial hospitalization within 14 days of the index episode start date	Total members diagnosed with a new episode of alcohol or drug dependency during the first 10.5 months of the measurement year	
Engagement in alcohol and other drug dependence treatment	NQF #0004	Members with initiation of treatment and two or more inpatient admissions, outpatient visits, intensive outpatient encounters or partial hospitalizations with any alcohol or drug diagnosis within 30 days after the date of the initiation encounter	Total members diagnosed with a new episode of alcohol or drug dependency during the first 10.5 months of the measurement year	
Continuity of pharmacotherapy for OUD	NQF #3175	Members who have at least 180 days of continuous	Total members who had a diagnosis of OUD and at least	Evaluation period of one year instead of two

		pharmacotherapy with a medication prescribed for OUD without a gap of more than seven days	one claim for an OUD medication	
Any SUD Treatment	CMS Metric #6	Members w/ at least one SUD treatment service or pharmacy claim	Total Medicaid members	
Emergency Department Follow-up	NQF #2605	Members w/ a follow-up visit within 7 days and 30 days of emergency department visit	Total members w/ SUD diagnosis and an emergency department visit	
Access to preventive / ambulatory health services (AAP)	NCQA Metric #32	Members w/ at least one ambulatory or preventive care visit	Total members with SUD diagnosis and continual enrollment	
Inpatient stays for SUD per 1,000 Medicaid beneficiaries	CMS Metric #24	Members with inpatient visit for SUD	Total Medicaid members	Evaluation period of one year instead of monthly
Days in treatment	None	Total number TAM members in SUD treatment receiving comprehensive dental services	Total number of TAM members in SUD treatment and TAM members receiving any dental services	

Metric #23: Emergency Department Utilization for SUD per 1,000 Medicaid Beneficiaries	CMS	Total number of ED visits for SUD per 1,000 beneficiaries in the measurement period	Beneficiaries enrolled in Medicaid for at least one month during the measurement period	
Mean Emergency Department cost per SUD client	None	Total Cost of SUD related ED visits in the measurement period	Total number of Clients who received SUD emergency services in the measurement period	
Metric #24: Inpatient Stays for SUD per 1,000 Medicaid Beneficiaries	CMS	The number of inpatient discharges related to a SUD stay during the measurement period	Beneficiaries enrolled in Medicaid for at least one month during the measurement period	
Metric #8: Outpatient Services	CMS	Number of beneficiaries who used outpatient services for SUD during the measurement period	All Medicaid beneficiaries with SUD diagnosis enrolled for any amount of time during the measurement period	

Metric #11 Withdrawal Services	CMS	The total number of unique beneficiaries with a service or pharmacy claim for withdrawal management services during the measurement period	All Medicaid beneficiaries with SUD diagnosis enrolled for any amount of time during the measurement period	

CMS = Centers for Medicare and Medicaid Services. NQF = National Quality Forum, NCQA = National Committee for Quality Assurance

Due to the nature of the analysis looking at change over time, the same versions of these metrics must be used for every year for the results to be comparable over time. The versions of the metrics were taken from those listed in the Section 1115 Substance Use Disorder Demonstrations: Technical Specifications for Monitoring Metrics Version 2. Two of the outcome metrics used did not have standardized national metrics specified. These were emergency department costs per SUD client and TAM (SUD) definition for successful treatment. (TAM and ED cost). Table 6 outlines which metric measures are related to each research question.

Table 6. Outcome Measures for each SUD Hypothesis.

Hypothesis 1: Percent of members who are referred and engage in treatment for SUDs will increase.	• Initiation and Engagement of Treatment
Hypothesis 2: Percent of members who adhere to treatment of SUDs will increase.	• Continuity of Pharmacotherapy • Any SUD treatment (treatment utilization)

Hypothesis 3: Rate of emergency department and inpatient visits will decrease.	• Follow up after Emergency Department visit of AOD • Inpatient Stays for SUD
Hypothesis 4: Percent of members with SUD who experience care for comorbid conditions will increase.	• Preventative health care/ambulatory visits
Hypothesis 5: Rate of overdose deaths due to opioids will decrease.	• Deaths due to opioids
Additional research questions.	
The Demonstration will improve SUD treatment completion among the targeted adult Medicaid (TAM) population.	• Number of days in treatment and percent retained in treatment 90 or more days.
Will the number of individuals receiving emergency department services for substance use disorder decrease in waiver implementing counties?	• Metric #23: Emergency Department Utilization for SUD per 1,000 Medicaid Beneficiaries
Will ED expenditures decrease for substance use disorder services in implementing counties?	• Mean Emergency Department cost per SUD client

Will the number of inpatient hospitalization days for SUD services decrease in waiver implementing counties?	• Metric #24: Inpatient Stays for SUD per 1,000 Medicaid Beneficiaries
Will the number of outpatient (OP), intensive outpatient (IOP), or partial hospitalization visits for SUD services increase in Salt Lake County?	• Metric #8: Outpatient Services
Will the number of beneficiaries who utilize withdrawal management services increase in implementing counties?	• Metric #11 Withdrawal Services

Specific ECHO Survey quality measures of patient experience included in the beneficiary survey included: recognition of plan coverage for mental health and SUD services, availability of services, getting treatment quickly, overall rating of counseling and treatment, and patient rating of the helpfulness of the care received. Specific measures from the beneficiary survey are listed in Table 7 below.

Table 7. Description of Beneficiary Survey Measures.

Evaluation Design Hypothesis	Beneficiary Survey Question
Hypothesis 1: Percent of members who are referred and engage in treatment for SUDs will increase.	• Patient experience with care. Q30 – Does your plan cover MH, SUD, counseling, treatment? • Community knowledge of available treatment and services Q31 – Are there places in your community you can get help?

	Q32 – Did you or a member of your household need help?
Hypothesis 2: Percent of members who adhere to treatment of SUDs will increase.	• Patient experience with care Q33 – Able to get services as quickly as possible Q34 – Rate the care received Q35 – How helpful was the care received

Data Sources

Quantitative Analysis

Administrative data was provided by UDOH and include Utah Medicaid claims, procedure, drug, and diagnosis and eligibility information for beneficiaries. Data includes pre-demonstration data beginning January 2016 and extends through the current reporting period. The Behavioral Risk Factor Surveillance System (BRFSS) data will be used to compare the percent of residents who are uninsured. BRFFS is operated by the CDC and collects national-level data on over 400,000 U.S residents. The BRFSS includes a wide variety of health-related risk behaviors, events, chronic health conditions, and use of preventive services. The survey uses randomly selected adults using both landline and cellular telephones.

Beneficiary Survey

The beneficiary survey is an online survey consisting of 46 questions administered to a statewide cross-sectional sample of Medicaid beneficiaries. The survey was administered to a purchased panel by Qualtrics Inc., one of the foremost research panel aggregators in the world. Qualtrics has a national panel of Medicaid beneficiaries who participate in a variety of surveys. The survey has been administered twice, in 2020 and 2021. A third administration is planned for 2022. The survey is conducted online and a stratified approach to data collection is used to achieve statewide representation (geographically) as well as a male / female stratification that approximates Utah

Medicaid enrollees. The total sample for each of the first two data collection periods was similar (2020 N=415, 2021 N = 410). Several systematic data checking processes are utilized. First, the data is reviewed for duplicates. Second, surveys that are completed too quickly are reviewed and through proprietary algorithm responses are assigned a "fraud score" and are checked manually. The two annual surveys were not weighted. This design will compare group-level outcomes at various times to understand how a demonstration's effects change over time. The survey questions are standardized questions and composite question scales from the BRFSS, CAHPS® and CAHPS® Experience of Care and Health Outcomes (ECHO) Survey, which asks health plan enrollees about their experiences with health care services, including behavioral health care services.

All Payers Claims Data

All-payer claims databases (APCDs) are large State databases that include medical claims, pharmacy claims, dental claims, and eligibility and provider files collected from private and public payers. The merge of Medicaid claims to All Payers Claims Data (APCD) data in Utah makes for a particular strength in Utah for cross-checking and substantiating the integrity of Medicaid data within the APCD relative to Medicaid data alone. Furthermore, the APCD permits a more seamless assessment of beneficiaries that transition between Medicaid and commercial insurance than permitted by Medicaid claims and encounter data alone. This also permits excellent value in constructing matched controls and in integration of potentially important time-dependent covariates in multivariate analyses. It should be noted that the APCD data contains a substantial portion of commercial claims but does not contain claims for insured individuals of Employee Retirement Income Security Act (ERISA) plans nor those who are uninsured.

Analytic Methods

The approved SUD utilized a DiD analysis, which studies the differential effect of a treatment on a target and comparison group[8]. It allows observational data to have the similar statistical power to an experimental study design. A DiD design compared SUD residential expansion counties with SUD residential services in non-expansion counties. The four assumptions of a DiD analysis are equivalency of population characteristics, parallel trends, spillover effect, and common shock. The first three assumptions were tested using summary statistics and logistic regression models. However, the common shock assumption involves exogenous forces and is difficult to test. In discussion with the UDOH team, no concerns about external factors were raised so it is assumed that no major events unrelated to the Medicaid waiver impacted one group differently than the other.

The covariates included in the DiD model were age, race, gender, Hispanic, and diagnosis of alcohol SUD, opioid SUD, other SUD, and mental health. Means, standard deviations, and standardized mean differences were calculated for each covariate to test for equivalency of

population characteristics. The equivalency of population characteristics compared the target and comparison groups for 2016, the target group for 2016 and 2018, and the comparison group for 2016 and 2018. Covariates with a standardized mean difference above 0.1 indicated inclusion in the DiD models.

Parallel trends assume that any trend in the outcome between target and comparison groups are the same prior to intervention. The interaction term between group and time was determined using a logistic regression model. A significant interaction term indicates a trend and the DiD analysis will be biased. The spillover assumption states that the comparison group has no measurable change in outcome at the time of implementation. This was tested using a logistic regression model for the comparison group. Causal effect is established when all DiD design assumptions are met. All metrics met these assumptions and were analyzed using DiD.

Annual analysis of beneficiary survey responses are used to assess patient experience of care, satisfaction with access and timeliness of care, and will be analyzed with descriptive measures.

We also used an CITS design to compare the impact of clinically managed residential withdrawal service provision through Medicaid in Salt Lake County to the other non-implementing Utah counties. Logistic regression was used to test for these differences. Population equivalency at baseline and from pre to post intervention was tested for the following characteristics: age, race, gender, Hispanic, and diagnosis of alcohol SUD, opioid SUD, other SUD, mental health, and type of Medicaid eligibility. Means, standard deviations, and standardized mean differences were calculated for each covariate to test for equivalency of population characteristics. Covariates with a standardized mean difference above 0.1 indicated inclusion in the models. This testing helped control for selection bias which is a common threat to internal validity in ITS designs.

One month prior to the implementation of clinically managed withdrawal, UDOH implemented its Medicaid adult expansion across the state. As this was implemented statewide it is assumed that it would impact both the target and comparison groups. There are no other known historical factors that impacted one group more than the other.

Revised Design and Analysis

The original 1115 Primary Care Network (PCN) Evaluation Design was approved by CMS on October 16, 2019. The design included a variety of hypotheses and research questions addressing the primary goals of the waiver, which were to increase access, improve quality, and expand coverage to eligible Utahns. Key activities to accomplish this included enrollment of new populations, quality improvement, and benefit additions or changes. While the 2021 Interim Evaluation report's preliminary findings supported improvements in select hypotheses, in general, the findings were not robust enough to conduct multivariate analyses at the time of reporting. As a result, those findings did not yet demonstrate statistically significant improvements in access and utilization of appropriate health care and associated health outcomes.

Given the limited statistical analysis to date, which has focused on the use of T-test and Chi-square tests to compare the outcomes annually, the independent evaluators proposed a modified approach to the existing evaluation (originally submitted to CMS 12/3/2021). To strengthen the quantitative analysis and design the recommendation incudes adding some new statistical approaches, which will make the evaluation more robust by using approaches that will account for changes over time. Specifically, this novel approach will help control for the effects of covariates (including COVID) that may affect outcomes. To improve the capacity of the evaluation to measure the outcomes of the waivers of interest over time, new statistical and design approaches will be used.

Considering the longitudinal data and the characteristics of the outcome variables, we propose two statistical approaches to evaluate changes in outcomes over time for several hypotheses. For annual outcome measures, the first approach will be generalized estimating equations (GEE). This method will be used to evaluate changes in outcomes with individual subject level data. This method also has the capacity to control for any impact of the pandemic on the outcomes (i.e., indicator variable: before the pandemic-0 vs. after the pandemic-1).

Considering the characteristics (e.g., statistical distribution) and multiple measures of outcomes on the same subjects over time, GEE is appropriate for evaluating the effects of the waivers on such outcomes. GEEs are flexible for diverse types of outcomes (e.g., continuous, binary and counts) and are appropriate for evaluating the impact of waiver implementations. The outcomes that were aggregated annually will be subject to a new statistical approach using GEE. Time-varying (e.g., age and healthcare use) and time-invariant variables (e.g., sex, race/ethnicity) will be controlled for in multivariate regression. An unstructured covariance matrix will be assumed to avoid imposing specific assumptions concerning distribution of random effects. We will adjust for relevant factors (including the number of COVID cases) that could affect the outcomes. This can be expressed,

$$L(Y\_it)=X\_(it)^{\prime}\beta$$

where L is a link function, i represents the subject, t indicates time (i.e., quarter), β is a k by 1 vector of regression coefficients including β_0, and X_it^' indicates an n by k matrix with covariates. X_it^' includes baseline factors of subjects, time dummies, and number of COVID cases (per 100,000). The time dummy variables will reveal if the outcomes change over time (reference year vs. another year). Also, the Wald test will be used to compare any difference in the outcomes across two years following a regression.

The second approach is an Interrupted Time-Series (ITS) and a Bayesian structural time-series (BSTS) which will be used for outcomes that were measured quarterly. Because we had annual measures of all the outcomes in the evaluation, we were not able to apply ITS. As we will

calculate the outcomes quarterly for both pre-intervention and post-intervention periods, ITS and BSTS will be able to evaluate the impact of the intervention. For the quarterly outcomes, ITS with the intervention group only will be applied because some subjects were on and off from Medicaid enrollment. The denominator changes will be taken care of by ITS. To reflect the impact of the COVID-19 PHE, a dummy variable (0 before March 2020, and 1 after March 2020) will be included in ITS. Also, the number of COVID cases will be controlled in the regression to measure severity of COVID.

The BSTS has an ability to infer causal impact of the implementations and will calculate how much increase or decrease in the outcomes will be due to the intervention. The BSTS with unobserved components that are state-space models for time-series data will be used. BSTS has been used for causal inference by researchers[9] and is likely better than the difference-in-difference approach often used to measure impact of an intervention over time. Using the observation equation and the state equation the BSTS model can be expressed as follows,

$$Y(t)=\pi(t)+X(t)\beta+S(t)+\varepsilon(t),\varepsilon(t)\sim N(0,\delta\_\varepsilon\hat{}2\ )$$

$$\pi(t+1)=\pi(t)+u(t),u(t)\sim N(0,\delta\_u\hat{}2)$$

where X(t) represents a set of covariates, S(t) represents seasonality, $\pi(t)$ represents the unobserved trend that defines how the latent state changes over time. The covariates will include average age, % of female, race/ethnicity (if available) and number of COVID cases per 100,000.

Methodological Limitations

There are several limitations to the current study. The primary limitation of the methodology for the CE, TA, BDD, and UPP demonstrations is the absence of adjustment for demographic, comorbidities, and other dimensions of the enrollee population in the descriptive statistics generated. As a result, some parameters that may have been significantly affected by the demonstration may not have been isolated due to the heterogeneous composition of the sample or to changes over time in that composition.

A second limitation is associated with the absence or paucity of time-dependent data, necessitated by the brief period encompassed in this report. For example, results for treatment for smoking or hypertension may have lags that are beyond the window of the analyses. Such longer-term effects will be more evident as there is reassessment from periods after the first or second year. Furthermore, the restricted one-year periods in the analysis window prior to implementation of the demonstrations did not permit assessment of variation in length of time for which conditions like smoking, hypertension, depression, and substance abuse were present and potentially untreated prior to the demonstration. Such duration of chronic conditions could be significantly associated with the response to any intervention. Finally, health care utilization and

costs may increase up initially for conditions that have been neglected and accumulated due to absence of insurance coverage and medical care. Longer follow up may demonstrate more substantial cost savings as such care is provided and deleterious conditions and habits are addressed.

A third limitation concerns the relatively limited set of measures in certain instances that were assessed to gauge effect. Hypertension, for example, is well established as a condition that responds to good primary care management and hypertensive medication. But there are other conditions that are responsive to good primary care that may be as consequential to health outcomes, if not more so among certain sub-populations. These would include obesity and timely and appropriate prenatal care for pregnant women. For the Blind and Disabled Dental (BDD) program, outcomes to date focus strictly on dental utilization and cost, but dental care is also a gateway to better general health. It may be worthwhile to include outcomes on other medical health care utilization, outcomes and costs that may be attributable to dental coverage. For this and several other of the demonstrations, it may be worthwhile to include a broader set of outcomes in future analyses as described above.

A fourth limitation is that some outcome measures, such as patient satisfaction, are subjective by nature. While such outcomes are of importance in and of themselves, supplementation with objective data, for example on appropriate care according to recommended guidelines, may extend the value generated from subjective data.

A fifth limitation relates to "churning" of enrollment in the demonstrations. Some beneficiaries are enrolled for a brief time, while others for more prolonged periods. The analyses were oftentimes restricted to eleven or twelve months of continuous enrollment to assess effects. As a result, however, potentially distinct effects for those enrolled for short periods of time were not assessed.

A sixth limitation is the disruptive nature of the pandemic in 2020, which likely altered eligibility in a manner that changed the comparative nature of the sample over time. While some became newly eligible based on weak labor market conditions, others perhaps experienced extended eligibility associated with the same factors. The pandemic also may have delayed care in some instances and altered the venue of visits from face-to-face to telehealth in certain instances. The impact of such changes in care delivery on quality merit study, are beyond the scope of this evaluation.

A seventh limitation in using the BRFSS data to monitor changes among the uninsured are two-fold. First, the survey is self-reported which introduces bias. Second, state level BRFSS data represent the general population, preventing deeper and more meaningful analysis within various waiver and population-specific groups. Further, employing national survey data for an out-of-state comparison can also be problematic because the data collection period of the survey (e.g., BRFSS) may not align with the demonstration timeline.

Recommendation 3: Plans to Address Methodological Challenges Presented by the COVID-19 PHE. Several changes have been made to evaluation designs which strengthen the overall evaluation capacity, leading to a more robust analysis. Specific examples of these changes include:

1) Using the generalized estimating equations (GEE). This method will measure changes in outcomes with individual subject level data. This method also has the capacity to control for factors such as the PHE on the outcomes over time and adjust for relevant factors (including the number of COVID cases) that could affect the outcomes. Also, the Wald test will be used to compare any difference in the outcomes across two years following a regression.

2) Given the available data for some demonstration populations during the pre-waiver period, regional COVID-19 positivity rates will be examined by quarter as another variable that may need to be controlled. Some of these began before or during the initial impacts of the pandemic.

3) Sensitivity analyses will be conducted to inform the effect of study design on impact estimates. For example, in the case of the ISS design, the evaluator must re-estimate key impacts of the revised cohort design to determine whether this approach—using the target cohort and earlier cohort (as a reference group) and GEEs with dummy variable—substantively influences the impact estimates. Second, given that regression models are being employed, the evaluator will test the sensitivity of key impact estimates to different modeling choices such as functional form. If a high degree of sensitivity is found, an explanation will be required that informs the credibility of the estimates.

4) The evaluators will include a falsification test that can increase confidence in the design, by providing evidence that the design isolates the impact of the waiver activities from other factors that might affect key outcomes. This is done by selecting an outcome measure that would not be expected to change due to the demonstration and then estimate that impact of the demonstration using the design on that outcome. For example, preventive dental service utilization could be used as a placebo outcome since it is not likely to be affected by any non-dental related demonstrations.

Finally, the integrity of empirical evaluation is contingent on quality of data. While the claims data used in much of the evaluation is of high quality, there are potential limitations that are associated with administrative claims data in general. Diagnoses must be filled in comprehensively and accurately by providers, for example. That may vary systematically across providers and result in distortions in assessment. Certain quality controls can be engaged, such as investigating the extent to which a diagnosis is listed in more than one claim, or whether a procedure is consistent with a diagnosis.

For the SUD evaluation, many of the metric specifications have changed throughout the years and not all the metrics were designed for the purpose of measuring change over time. For this

analysis, outcomes for each year were measured using the same version of the metric, even if the measure specifications changed. Two of the metrics needed modifications to work with the evaluation design. Since we were limited to one year of before and after intervention data, we had to modify the continuity of pharmacotherapy metric to look at a one-year time-period rather than a two-year time-period. This resulted in lower numbers of clients meeting the criteria for this metric and may not have allowed enough time to pass to detect a change in the metric. Additionally, we had to modify the metric for inpatient stays for SUD to an annual metric rather than a monthly metric to fit with the evaluation design.

Even though there were two available years of data, we were only able to look at one year due to losing the comparison population in 2019. This report moved forward with the original design, however, for future reports the design will need to change to a single group longitudinal study to look at change in subsequent years of the demonstration. Systematic change can often take time to see results particularly considering that IMDs were not all implemented at once and the number of beds has continued to increase throughout the duration of the demonstration. As such, one year of data may not have been enough time to detect significant changes in the analyses.

One explanation for the lack of significance in the results is possible unknown external factors that were not controlled for in the model. One potentially relevant factor may be implementation factors. When making system wide service changes, implementation factors can also have an influence on outcomes that can make it difficult to pinpoint if the results (or lack of results) may be due to implementation factors versus program factors. For instance, an intervention may indeed be effective, but if it is not implemented correctly, or if it takes a long time to implement, the results may not show an impact on outcomes, or the impact may be delayed. It may be valuable to explore and examine potential process metrics or other potential confounding factors for future analyses if feasible.

Another limitation to being able to measure long term changes in Medicaid beneficiary satisfaction with SUD treatment services is the inability to link annual satisfaction surveys administered to those receiving treatment in publicly funded SUD programs. Utah, like most other states, sets benchmarks in publicly funded SUD treatment programs for consumer satisfaction with treatment services. However, there is great variance in the way local programs implement the Mental Health Statistics Improvement Program (MHSIP) which prevents accurate tracking of responses by the Medicaid eligible population.

For the clinically managed residential withdrawal services there were only limited control variables, which did not ensure the populations were comparable between the target population and the rest of the state. We were not able to match comparison counties, although we did control for variables that were dissimilar between the groups and time points.

Other Additions

Previous feedback (January 27, 2022) suggested several considerations to strengthen the Summative Report. This feedback was listed under four subsections (i.e., data considerations, research question considerations, methodological considerations, and presentation considerations). Each of these considerations is listed below with a corresponding response or reference to the location within the report where the response has been addressed. Also, CMS has already received two formal requests (i.e., SUD Revised Evaluation Design [submitted to CMS 8/31/2021] and 1115 Revised Evaluation Design and Statistical Analysis [submitted to CMS 12/3/2021]) to modify existing designs. Where these novel approaches address comments related to supporting a more thorough evaluation of the PCN demonstration, including implementing approaches to control for COVID-19 PHE effects on outcome measures, it will be noted "under CMS review".

1. Data Considerations

a) Currently the pre-implementation data includes 2016 data. Expanding the pre-implementation period may be feasible for a few of the waiver components, however, the frequent changes to services and eligibility groups in Utah presents a unique challenge. Since we have proposed modifications to several designs (under CMS review) which incorporate the more rigorous interrupted time series (ITS) designs, where appropriate pre-implementation timeframe will be adopted.

b) A few of the waiver components could have post-implementation periods that align with the start of the pandemic. However, for some components, implementation was delayed for multiple reasons (including the COVID-19 PHE) which creates challenges when weighing their relative impact on outcomes. For the purposes of this consideration, the independent evaluator and UDOH will develop a consensus regarding the definition of when the PHE has ended. This approach will inform the data analysis for the summative report.

c) Description of beneficiary survey methods, sample design, response rates, sample size, weighting, and data quality are included in the Data Sources above.

2. Research Question Considerations

a) A more robust design and analysis will be more likely to detect the impact of dental services on SUD treatment outcomes.

3. Methodological Considerations

a) The Summative Evaluation Report will employ more rigorous design and analysis methodologies as described in the revised SUD Evaluation Design and the Revised 1115

Design and Statistical Analysis (under CMS review) that will increase the likelihood of supporting causal inferences of demonstration impacts. Additional methodological description and clarification were provided in the documents previously listed (under CMS review) and are also contained in Table 1 above. In addition, the narrative in the Revised 1115 Design and Statistical Analysis will strengthen the Summative Evaluation Report. Specific revisions to the Current Eligibles, Targeted Adults, and Blind and Disabled Adults were included in the revised 1115 Design and Statistical Analysis document cited previously in this section.

b) The Revised SUD Evaluation Design (under CMS review) proposes the use of propensity score matching between Medicaid beneficiaries to create a comparison group (matched) of others receiving treatment through publicly funded SUD systems, when appropriate.

c) Statistical significance tests in the descriptive analyses are included in Summary Tables of this revised report.

d) The previously cited (Revised SUD Evaluation Design) proposal eliminated the DiD analyses based on the unanticipated and rapid expansion of SUD services in geographical areas originally intended as comparison communities. Further, the state identified and listed propensity score matching as an approach in the Revised SUD Evaluation Design (under CMS review), Hypothesis 2 "percentage of members who adhere to treatment of SUDs for both treatment completion and return to treatment". With CMSs approval, this revised design and analysis will be included in the Summative Evaluation Report.

4. Presentation Considerations

a) The results section of this Revised Interim Report includes a description of each waiver policy being evaluated, the study populations, how metrics should be interpreted, and the analytic approach.

b) The Summative Report will include the consistent use of precision measures such as standard errors or confidence intervals for all quantitative outcomes.

Results are reported by hypothesis and reference the tabular results provided by hypothesis.

Current Eligibles (CE)

With respect to Hypothesis CE1, results, drawn from Medicaid claims and encounters, are provided in Tables 8-10. The current eligible population declined slightly from 2017 to 2020 (Table 8), but there is no indication, without further multivariate analysis, whether this decline was attributable to increased cost-sharing. Aggregate co-pays decreased in that same time-period, not simply due to the decline in enrollees, and average co-pays decreased over 10%

from $5.61 to $5.04 from 2017 to 2020 and a significant decrease to $2.38 in 2020 (Table 9). Such

decline merits additional analysis. Hypertensive diagnoses, a proxy for health, and hypertensive medication, a proxy for good health management, held steady throughout the period, with the former a less than 1% and the latter at 21% decline by 2020 (Table 10). Mean prescriptions per member per month remained steady both before and after the copay increase except for an increase during the third and fourth quarters of 2019 (Figure 2).

The percentage of enrollees diagnosed with hypertension with antihypertensive prescriptions dipped continuously from 61% in 2017 to 48% in 2020 (Table 10). None of the figures adjusted for severity of hypertension, which would merit future attention. Mean hypertensive pharmacy prescriptions steadily declined about 17% during the period from 2017 to 2019 and then remained at a similar level in 2020, perhaps reflecting changes in the number of pills per prescription (Table 10).

Sample selection criteria for table entries are indicated in notes below tables. Some require enrollment for at least one month (Tables 9 and 10). Hypertension diagnosis and management indicators were limited to those with 11 or 12 months of continuous enrollment (Tables 9 and 10), reflecting HEDIS criteria. While p values suggest significant changes in several instances, that is attributable to large sample sizes, and the small magnitude of the changes indicate no clinical significance.

Table 8 Total Current Eligible Members by Year.

FY	Unique members	Average monthly enrollment
2017	51343	30716
2018	51238	30852
2019	48990	28905
2020	40633	24010

Note: Includes number of clients enrolled for at least one month within the year and average beneficiaries enrolled per month.

Table 9. Average Copayment Amount per Person per Month.

FY	Total copayment	PMPM copayment
2017	$1,988,676	$5.40
2018	$2,075,782	$5.61
2019	$1,749,405	$5.04
2020	$684,639	$2.38

Table 10. Adults with Hypertension Diagnosis, Antihypertensive Prescriptions, and Average Monthly Hypertensive Prescriptions.

FY	Mean Prescriptions	Mean drug quantity per prescription	Mean days supplied per prescription	% With hypertension diagnosis	% Of subjects with antihypertensive prescriptions among subjects with hypertension diagnosis
2017	0.47	36.18	30.07	12.72	60.99
2018	0.39	37.52	30.39	12.75	52.62
2019	0.32	41.72	33.09	12.60	47.78
2020	0.31	44.98	36.10	12.69	48.26

Note: Selects those with 11- or 12-months continuous enrollments (e.g., HEDIS criterion). Note 2: Considers members who had hypertension diagnosis.

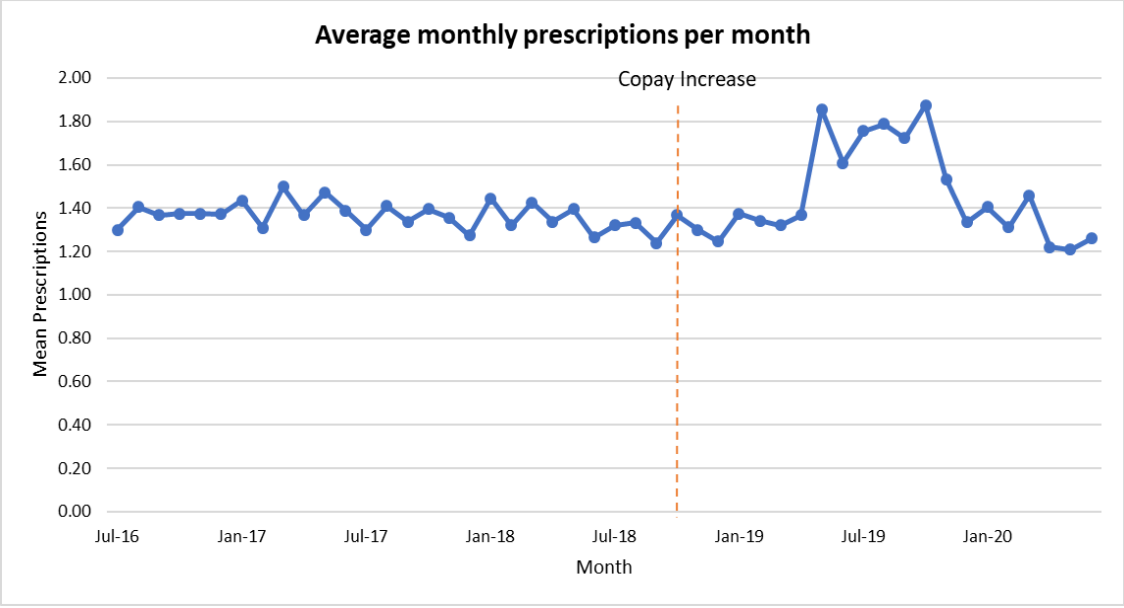
% With hypertension diagnosis

2017 vs. 2018: p-value=0.93
2018 vs. 2019: p-value=0.73
2019 vs. 2020: p-value=0.86

% Of subjects with antihypertensive prescriptions (among those who had hypertension diagnosis)

2017 vs. 2018: p-value=0.00
2018 vs. 2019: p-value=0.00
2018 vs. 2019: p-value=0.77

Figure 2. Mean Pharmacy Prescriptions Per Member Per Month before and after Copay Increase.



Average Monthly Hypertensive Prescriptions

2017 vs. 2018: p-value<0.01
2018 vs. 2019: p-value<0.01
2019 vs. 2020: p-value<0.01

Mean drug quantity per prescription

2017 vs. 2018: p-value<0.01
2018 vs. 2019: p-value<0.01
2019 vs. 2020: p-value<0.01

Mean days supplied per prescription

2017 vs. 2018: p-value<0.01
2018 vs. 2019: p-value<0.01
2019 vs. 2020: p-value<0.01

Additional results on CE enrollees are included below in the discussion of enrollees in the PCN use of ED relative to enrollees in the PCN.

Primary Care Network (PCN)

With respect to Hypothesis PCN 2a, the % of uninsured adults, based on data from the Behavioral Risk Factor Surveillance System (BRFSS) in poverty are provided in Table 11. While means fluctuated slightly over the period from 2016 to 2019, there was no significant change at around 35% for the entire duration. Because the PCN demonstration was suspended in March 2019, no summary statistics were generated for the program in 2020.

Table 11. Percentage of Uninsured Adults in Poverty in Utah by Year.

Year	Percent Uninsured	Lower 95% Confidence	Upper 95% Confidence
2016	35.2	30.4	40.4
2017	39.7	34.9	44.7
2018	35.9	31.5	40.6
2019	36.8	32.2	41.7

Note. Includes Adults in Utah with 0 to 100% Poverty. Numbers retrieved from the Utah Behavioral Risk Factor Surveillance System.

2016 vs. 2017: p-value=0.33
2017 vs. 2018: p-value=0.40
2018 vs. 2019: p-value=0.84

For Hypothesis PCN 2b, there is some preliminary indication that there was slight improvement in PCN access to care from 2017 to 2018 as measured by hypertension diagnosis and treatment (Table 12). In that period, there was close to a 2-percentage point increase (from 14.9% to 16.8%) in those diagnosed with hypertension. Despite the small increase in the percent of those diagnosed with hypertension, the percentage of those receiving medication during the period held steady at around 57%.

Table 12. Adults with Hypertension Diagnosis and Antihypertensive Prescriptions.

FY	Unique members	% With hypertension diagnosis	% Of subjects with antihypertensive prescriptions^{+}
2017	24421	14.93	56.56

2018	23844	16.75	57.04
2019	24336	*	*

Note: Selects those with 11- or 12-months continuous enrollments (i.e., HEDIS criterion). No HEDIS data were available for 2019 as of the time of this report.

*In 2019, all subjects had 9 months enrollment as maximum, so the numbers were not calculated.

[+] Among those who had hypertension diagnosis

The percent of patients with a hypertension diagnosis increased 14.93% in 2017 to 16.75% in 2018. This increase is statistically significant (p-value >.000). Percent of patients with antihypertensive prescriptions did not change statistically (2017 vs. 2018: p-value=0.67).

In terms of testing ED utilization among the PCN population, there was an increase over 2017-2019; when statistics were broken into PCN1 and PCN2 (Table 13), this increase was primarily due to a change in the PCN composition between PCN1 and PCN2 enrollment rather than changes in ED utilization within those groups. ED utilization was lower among enrollees with children (PCN1) (about 20 visits per 1000 enrollees per month each year, Table 14) than enrollees without children (PCN2), who experienced a slight increase from about 42 to 46 visits per 1000 enrollees per month (Table 10). The overall increase exhibited in Table 14 was therefore attributable to a substantial decline in PCN1, where utilization was lower, and a substantial increase in PCN2, where ED use was significantly higher.

Table 13. Emergency Department Utilization per PCN member and Average Non-Emergent ED utilization by PCN Members Per Year (PC1+PC2).

FY	Total ED visits	ED visits per member per month per 1000	Total non-emergent ED visits	ED visits per member per month per 1000
2017	5051	29.25	2037	11.79

2018	5664	34.77	2338	14.35
2019	5245	37.23	2249	15.96

Note: Includes members who had at least 1-month enrollment.

Table 14. Emergency Department Utilization per PCN Member and Average Non-Emergent ED utilization by PCN Members Per Year (PC1 only).

FY	Total ED visits	ED visits per member per month per 1000	Total non-emergent ED visits	ED visits per member per month per 1000
2017	2186	20.88	864	8.25
2018	1381	18.69	582	7.88
2019	1008	20.66	439	9.00

Table 15. Emergency Department Utilization per PCN member (PC2 only).

FY	Total ED visits	ED visits per member per month per 1000
2017	2865	42.11
2018	4283	48.12
2019	4237	46.01

Information on ED claims between the PCN and CE enrollee population are provided in Tables 16 and 17. ED utilization was significantly higher among the CE enrollee population than among the PCN population, but while claims per 1,000 members per month declined for CE enrollees, they increased, as noted above, for PCN enrollees. Thus, the ratio of PCN to CE ED claims increased from .31 to .43 over the period (Table 19, final column).

Table 16. Emergency Department Utilization per Current Eligibles.

FY	Total ED visits	ED visits per member per month per 1000
2017	34909	94.71
2018	32925	88.93
2019	30074	86.70

Note: Includes members who had at least 1-month enrollment.

Table 17. ED utilization per PCN member / Current Eligible (CE) Member Per 1000.

Emergency department claims per person per month per 1000

FY	PCN	CE	PCN/CE
2017	29.25	94.71	0.31
2018	34.77	88.93	0.39

2019	37.23	86.70	0.43

With respect to evidence on non-emergent ED utilization for the PCN and CE enrollee population, those data are provided in Tables 18-21.

Non-emergent ED visits per 1,000 enrollees per month increased for the overall PCN population from about 11.8 to 16.0 (Table 20). This increase was generated mainly by an increase among the PC2 population (having an increase from 17.2 to 19.2 in visits per 1,000 enrollees per month, Table 18). Non-emergent ED utilization was substantially higher among CE enrollees, at more than 3 times that of the PCN2 enrollee population. However, whereas PCN non-emergent ED utilization increased over 2017-2019 among PCN enrollees, it declined among CE enrollees, from about 65.1 to 60.2 per 1,000 enrollees per month from 2017 to 2019 (Table 19). The ratio of non-emergent ED utilization among PCN enrollees to that among CE enrollees therefore increased from about one-fifth (.18) in 2017 to over a quarter (.27) by 2019 (Table 20). Furthermore, average total monthly ED visits that were emergent among PCN enrollees declined from close to 60% to about 57%, reflecting the increase in non-emergent ED visits among that population (Table 21).

Table 18. Average Non-Emergent ED utilization by PCN Members Per Year (PC2 only).

FY	Total ED visits	Total non-emergent ED visits	ED visits per member per month per 1000
2017	2865	1173	17.24
2018	4283	1756	19.73
2019	4237	1810	19.66

Table 19. Average Non-Emergent ED utilization by Current Eligibles only Per Year.

FY	Total ED visits	Total non-emergent ED visits	ED visits per member per month per 1000
2017	34909	23981	65.06
2018	32925	23074	62.32
2019	30074	20881	60.20
2020*	*	*	*

* There were no subjects in the PCN in 2020.

Table 20. Non-Emergent ED Claims per person per month (PCN member / Current Eligible (CE) Member Per 1000).

FY	PCN	CE	PCN/CE
2017	11.79	65.06	0.18
2018	14.35	62.32	0.23
2019	15.96	60.20	0.27

Table 21. Percent of Average Monthly ED Visits without Non-Emergent ED Visits (PC1+PC2).

FY	Average Monthly ED visits without non-emergent ED	% Of average monthly ED visits without non-emergent ED
2017	421	59.86
2018	472	58.68
2019	583	57.16

% Of average monthly ED visits without non-emergent ED visits

2017 vs. 2018: p-value=0.01
2018 vs. 2019: p-value<0.01

Utah Premium Partnership (UPP)

The preliminary assessment of the success in UPP1 to UPP4 for enrollment of individuals in employer-sponsored insurance was assessed based on the number of enrollees and enrollee-months, given in Table 22. Total enrollment in UPP decreased from 2017 to 2019 from 780 to 615 and was reflected in a corresponding decrease in enrollment months from 6214 to 4848. The average number of enrollment months per enrollee decreased slightly from about 7.97 to 7.88. There was a precipitous decline in enrollment and average number of enrollment months in 2020 as indicated in the table, likely reflecting the impact of the COVID pandemic on employment and employer-provided insurance.

Table 22. Total UPP Members by Year and Month.

FY	Unique Members	Total enrollment months	Average number of enrollment months
2017	780	6214	7.97
2018	726	5716	7.87
2019	615	4848	7.88
2020*	486	3868	7.96

*The 2020 entries are based on data from July 2019 - June 30, 2020.

Targeted Adults (TA)

Next, several TA hypothesis and related research questions showed positive changes, beginning with the number of enrollees. Table 23 presents information on the increase in enrollment, 2,835 in 2018, more than doubling to 6,786 in 2019, and tripling to 8,517 in 2020. Similarly, the corresponding increase in average monthly members more than doubled from 1,529 in 2018 to 4,064 in 2019, and to 5,042 in 2020.

Table 23. Enrollees in TA.

FY	Unique Enrollees	Average monthly enrollment

2018	2835	1529
2019	6786	4064
2020*	8517	5042

*FY 2018 included 8 months (November 2017 through June 2018), while FY 2019 and FY 2020 considered 12 months.

TA16 to TA19 are related to primary care access and improved health status were tested assessing smoking diagnosis and cessation treatment (Table 24), antidepressant medication management (Table 25) and extent of preventive visits (Table 26). Associated costs of these treatments and visits were also assessed (Tables 27-29). The rate of smoking diagnosis and cessation treatment increased from 34% to 42% from 2018 to 2019, then slightly declined to 39% in 2020 (Table 24).

Major depression diagnosis increased markedly, as did the level of anti-depressant management and continuity of such management between 2018 and 2019. Diagnosis of major depression more than tripled from 374 to 1,211 (Table 25). The number of TA enrollees with antidepressant medication quadrupled from 222 to 829 over the same period. And management improved for this population despite the increase in numbers. Those with acute phase treatment increased from 56% to 69%, while those with effective continuous treatment increased from about 23% to 39% (Table 25). In 2020, the number of those diagnosed with major depression increased about 25% to 1,512. The percentage that received effective continuation phase treatment in 2020 increased further to 74%, so did the rate of effective continuous treatment to 47%. Even with the more than doubling in enrollees, the annual rate of those receiving at least one preventive care visit increased from 49% to about 56% (Table 26). That percentage remained relatively stable in 2020 at 57%.

With the increase in numbers receiving smoking diagnostic services noted above, there was a concomitant increase in aggregate costs (Table 27). Total costs for smoking cessation treatment increased from over $66,000 to nearly $373,000. Average cost per TA enrollee of smoking diagnoses and cessation treatment increased from $23.38 to $54.95 per enrollee (Table 27). Despite the decrease in numbers receiving smoking diagnosis services in 2020, aggregate costs doubled from 2019 to 2020. The per member cost consequently increased significantly to $89.08.

Similarly, total anti-depression management cost more than quadrupled over the period from 2018 to 2019, from about $25,600 to nearly $114,700 (Table 28), reflecting a quadrupling of enrollees being treated, but also perhaps some increase in continuity of care. The increase in per enrollee cost of such treatment was far more modest, from $8.67 to $16.89 (Table 28). Aggregate anti-depression management costs continued to increase to about $172,100 in 2020 along with enrollment. The average cost per member increased to $20.21.

The aggregate costs for preventive care visits also increased significantly with the increase in enrollment between 2018 and 2019, from about $975,300 to nearly $3,099,000 (Table 29). For this service, however, the per enrollee cost increased slightly, from $344 to $457. The per visit cost decreased slightly from $204 to $176 (Table 30). Aggregate costs moderately increased to nearly $3,751,000 with a slightly decreased average cost per member, at $440 in 2020 (Table 29). Such slowdown in increasing costs in preventive care was likely due in significant part to the COVID 19 pandemic. The decline in average cost per preventive care visit to $163 perhaps also reflected an increase in the composition of lower cost telehealth visits in the overall delivery of preventive visits (Table 32.1). There was a clear impact of the COVID pandemic on the delivery of preventive care visits for this population as indicated in the amount of telehealth versus in person visits provided in Table 32.1. While the number of preventive care visits per enrollee remained stable, the number of those visits delivered through telehealth increased upward by nearly two orders of magnitude from 33 in Q4 of 2019 to 2879 by Q2 2020, and from under 1% of total preventive care visits to over 42% of such visits (Table 31).

*Table 24. Percent of Adults with a Smoking Diagnosis.**

FY	Unique Enrollees	Percent
2018	2835	34.64
2019	6786	41.69
2020	8517	38.64

* Smoking includes diagnosis, screening, and cessation drugs.

2018 vs. 2019: p-value<0.01
2019 vs. 2020: p-value<0.01

Table 25. Annual Rate of Adults with Antidepressant Medication Management.

FY	Number of members with major depression diagnosis	Number of members with antidepressant prescriptions	Effective acute phase treatment* (%)	Effective continuation phase treatment** (%)
2018	374	222	55.86	22.97
2019	1211	829	69.12	39.45
2020	1512	1035	73.53	47.15

*Adults who remained on an antidepressant medication for at least 84 days (12 weeks).

**Adults who remained on an antidepressant medication for at least 180 days (6 months).

Effective acute phase treatment

2018 vs. 2019: p-value<0.01
2019 vs. 2020: p-value=0.01

Effective continuation phase treatment

2018 vs. 2019: p-value<0.01
2019 vs. 2020: p-value<0.01

Table 26. Percent of Adults with a Preventive Care Visit.

FY	Unique Members	Percent
2018	2835	49.21
2019	6786	56.22
2020	8517	56.55

2018 vs. 2019: p-value<0.01
2019 vs. 2020: p-value=0.68

Table 27. Average Smoking Diagnosis Cost Per Targeted Adult Member by Year.***

FY	Unique Members	Total	Average cost per member***
2018	2835	$66,278	$23.38
2019	6786	$372,905	$54.95
2020	8517	$758,665	$89.08

*Includes costs associated with smoking diagnosis, screening, and cessation drugs.

**Includes costs associated with outpatient visit and prescriptions.

*** $ in 2019

Table 28. Average Antidepressant Medication Management Cost Per Targeted Adult Member by Year.

FY	Unique Members	Total	Average cost per member*
2018	2835	$24,573	$8.67
2019	6786	$114,638	$16.89
2020	8517	$172,106	$20.21

* $ in 2019.

Table 29. Average Preventive Care Visit Cost Per Targeted Adult Member by Year.

FY	Unique Members	Total	Average cost per member*
2018	2835	$975,314	$344
2019	6786	$3,098,718	$457
2020	8517	$3,750,793	$440

* $ in 2019.

Table 30. Average Preventive Care Cost Per Visit by Year.

FY	Unique Members	Number of preventive care visits	Average cost per visit*
2018	2835	4792	$204
2019	6786	17574	$176
2020	8517	23022	$163

* $ in 2019.

Average cost per visit:

2018 vs. 2019: p-value<0.01
2019 vs. 2020: p-value<0.01

Table 31. Quarterly Total Number of Preventive Care Visits.

Quarter	Unique Members	# Of preventive care visits	Average # of preventive care visits per member	Preventive care visits via telehealth	% Preventive care visit via telehealth	# Of preventive care visits excluding telehealth	Average # of preventive care visits excluding telehealth

2018 Q1	*1356*	*1754*	*1.29*	*0*	*0.00*	*1754*	*1.29*
2018 Q2	*2372*	*2643*	*1.11*	*3*	*0.11*	*2640*	*1.11*
2018 Q3	*3275*	*3282*	*1.00*	*3*	*0.09*	*3279*	*1.00*
2018 Q4	*4064*	*4098*	*1.01*	*1*	*0.02*	*4097*	*1.01*
2019 Q1	*4341*	*5038*	*1.16*	*32*	*0.64*	*5006*	*1.15*
2019 Q2	*4577*	*5156*	*1.13*	*30*	*0.58*	*5126*	*1.12*
2019 Q3	*4818*	*5168*	*1.07*	*52*	*1.01*	*5116*	*1.06*
2019 Q4	*4769*	*5300*	*1.11*	*33*	*0.62*	*5267*	*1.10*
2020 Q1	*4832*	*5772*	*1.19*	*315*	*5.46*	*5457*	*1.13*

2020 Q2	*5750*	*6782*	*1.18*	*2879*	*42.45*	*3903*	*0.68*

TA 20 focused on Emergency Department (ED) utilization among chronically homeless enrollees (Tables 32-34). With the increase in enrollees, the number of monthly ED visits increased considerably, from 345 to 631 (Table 32). In both years, the proportion of non-emergent visits comprised about three-quarters of those visits. Clearly, improvement can still be made in terms of reducing the number and proportion of non-emergent ED visits. In 2020, ED use fell to close to 488. Non-emergent use as a percentage of the total remained about the same, however, at close to 80% (Table 33).

Concomitant with the increase in enrollees and use of the ED, the aggregate monthly ED cost increased from about $25,900 to about $51,300 in 2018 and 2019, respectively (Table 33). Average monthly costs of ED visits declined to $40,000 in 2020 with a very slight rise in unique members. The average actual cost of ED visits, however, remained stable, at close to $82 (Table 33).

Table 34 provides the top 5 diagnoses (based on primary diagnosis only) for ED visits in 2018 and 2019 and the associated monthly costs. The top 5 diagnoses are similar by rank between the two years, but not identical. For example, alcohol abuse with intoxication headed the list in 2018, but chest pain led the list in 2019. Costs associated with alcohol abuse with intoxication were highest in 2018 (at close to $11,000), and suicidal ideations were the costliest primary diagnosis in 2019 (about $25,431).

Table 32. Percent of Average Monthly ED Visits without Non-Emergent ED Visits.

FY	Average monthly ED visits	Average monthly non-emergent ED visits	Average monthly emergent ED visits	Percent of average monthly ED visits with emergent ED visits
2018	345	275	70	20.21

2019	631	502	129	20.50
2020	488	384	104	21.25

Percent of average monthly ED visits with emergent ED visits:

2018 vs. 2019: p-value=0.82
2019 vs. 2020: p-value=0.48

Table 33. Average Monthly Cost of ED Visits and Average Cost per ED Visit.

FY	Unique Members	Average monthly cost (total)*	Average cost per visit*
2018	1496	$25,892	$81.32
2019	2940	$51,299	$81.33
2020	2964	$40,005	$81.95

*Reimbursed amount only adjusted to $ in 2019.

Average monthly cost:

2018 vs. 2019: p-value<0.01

2019 vs. 2020: p-value<0.01

Average cost per visit

2018 vs. 2019: p-value=0.89
2019 vs. 2020: p-value=0.56

Table 34. Top 5 Emergency Department Diagnoses for Homeless Members in 2018 and Associated Costs.

2018			2019			2020		
Top 5 diagnosis	n	Cost*	Top 5 diagnosis	n	Cost*	Top 5 diagnosis	n	Cost*
Alcohol abuse with intoxication, unspecified	132	$10,942	Suicidal ideations	221	$25,431	Suicidal ideations	116	$12,366
Unspecified abdominal pain	121	$9,083	Chest pain, unspecified	179	$8,802	Alcohol abuse with intoxication, unspecified	74	$6,305
Chest pain, unspecified	119	$5,043	Alcohol abuse with intoxication, unspecified	167	$15,037	Other chest pain	71	$6,082

Major depressive disorder, single episode, unspecified	98	$10,219	Unspecified abdominal pain	140	$11,825	Chest pain, unspecified	69	$4,677
Other chest pain	71	$6,181	Other chest pain	133	$11,081	Unspecified abdominal pain	67	$5,816

*Reimbursed amount only adjusted to $ in 2019.

Alcohol abuse with intoxication, unspecified:

2018 vs. 2019: p-value=0.50
2019 vs. 2020: p-value=0.01

Chest pain, unspecified:

2018 vs. 2019: p-value<0.01
2019 vs. 2020: p-value<0.01

Unspecified abdominal pain:

2018 vs. 2019: p-value=0.77
2019 vs. 2020: p-value<0.01
P-value is calculated based on the proportional test

Hypothesis UC1 related to the cost of inpatient uncompensated care. As Table 36 demonstrates, there was a clear reduction in such uncompensated care, by nearly $2 million, in 2019 and 2020. This coincided however, with Medicaid expansion eligibility in the state which also was slated to substantially reduce uncompensated care. What proportion of the reduction was due to the demonstration would require more detailed analysis of inpatient utilization among those targeted in the demonstration.

Table 36. Uncompensated care in Utah.

Year	Total uncompensated care cost
2018	$200,173,232
2019	$181,861,938
2020	$182,368,112

Blind and Disabled Dental (BDD)

To gauge the effects of the BDD hypothesis and research questions, analyses were undertaken on the number of emergency and preventive visits and their associated costs.

Table 37 provides a summary of total dental visits among the approximately 48,000 unique enrollees in the program in 2018, 2019, and 2020. There was a large increase in total visits between the two years, from about 27,350 to close to 34,000. Emergency dental visits increased as well, but not nearly as much as total visits, leaving the percent of emergency dental visits for both years at nearly identical, and just less than 19%. The number of dental visits remained steady in 2020 from the previous year.

Given the substantial increase in total visits, total dental costs also increased, by about $1.1 million in 2019 or $1.2 million in 2020, respectively from $6.5 million in 2018 (Table 38). Emergency dental visits comprised a little over 10% of total costs in each year. Per member per month emergency dental costs increased from $1.38 to $1.76 over the period. Average monthly per member per month dental costs remained stable for preventive care, increasing from about $11.80 to $14.12 (Table 38).

Table 37. Percent of emergency Dental Services.

FY	Unique Members*	Total dental visits	Total emergency dental visits	% Of emergency dental visits
2018	48178	27365	5143	18.79
2019	47929	33954	6372	18.77
2020	46808	33238	6485	19.51

*Includes number of clients enrolled for at least one month within the year.

% Of emergency dental visits

2018 vs. 2019: p-value=0.93
2019 vs. 2020: p-value<0.01

Table 38. Average Monthly Dental Care Cost per Member Per Month.

FY	Total dental care costs	Total emergency dental care costs	Average monthly emergency dental care costs
2018	$6,528,087	$683,259	$1.38
2019	$7,654,055	$790,743	$1.62
2020	$7,736,613	$859,036	$1.76

Note: $ in 2019.

Average monthly emergency dental care costs

2018 vs. 2019: p-value=0.14
2019 vs. 2020: p-value=0.40

Table 39. Average Monthly Preventive Dental Care Cost per Member.

FY	Total dental care costs	Total preventive dental care costs	Average monthly preventive dental care costs
2018	$6,528,087	$5,844,827	$11.81
2019	$7,654,055	$6,863,312	$14.05
2020	$7,736,613	$6,877,577	$14.12

Note: $ in 2019.

Average monthly preventive dental care costs

2018 vs. 2019: p-value<0.01
2019 vs. 2020: p-value=0.92

Substance Use Disorder (SUD)

SUD measures that met the required testing assumptions were analyzed with DiD. The results are shown in the tables (as percentages) and figures (displayed as rates) below. However, no measures were found to be significant at the 0.05 level.

IET1: Percent of members who are referred and engage in treatment for SUDs will increase.

Table 41. Distribution of Initiation of Alcohol and Other Drug Dependence Treatment.

Year	Initiation of Treatment	Total Eligible Members	Percentage
2016	1,560	4,125	37.9%
2017	1,535	3,963	38.7%
2018	1,661	4,151	40.0%
2019	2,304	5,620	41.0%

Table 42. Distribution of Initiation of Alcohol and Other Drug Dependence Treatment by Group.

Year	Group	Initiation of Treatment	Total Eligible Members	Percentage
2016				
	Target	1,080	2,847	37.9%
	Comparison	480	1,278	37.6%

2017				
	Target	1,097	2,761	39.7%
	Comparison	438	1,202	36.4%
2018				
	Target	1,192	2,971	40.1%
	Comparison	469	1,180	39.8%
2019				
	Target	1,557	3,904	39.9%
	Comparison	747	1,716	43.5%

Tables 41 and 42 above show the percent of initiation of alcohol and other drug dependence treatment increasing each year. However, the target group had an increase in initiation from 2016 to 2018 and a decrease in 2019 while the comparison group had a decrease in initiation in 2017 and an increase for 2018 and 2019. As shown below in Table 43, both target and comparison groups have an increase of 2.19% in initiation of treatment. In 2016 and 2018, the initiation of treatment was higher in the target group compared to the comparison group. Overall, there is a 0% increase in the difference of the differences for initiation in alcohol and drug treatment. This difference was found to not be significant at the 0.05 level. Figure 3 shows the initiation change between groups from the pre-exposure period to the post-exposure period.

Table 43. Difference in Differences of Initiation of Alcohol and Drug Dependence Treatment.

Variable	Target	Comparison	Difference
One-year initiation rate (2016)	37.93%	37.56%	0.38%
One-year initiation rate (2018)	40.12%	39.75%	0.38%
Change in one-year initiation rate	2.19%	2.19%	0%

Figure 3. Difference in Differences of Initiation of Alcohol and Other Drug Dependence Treatment.

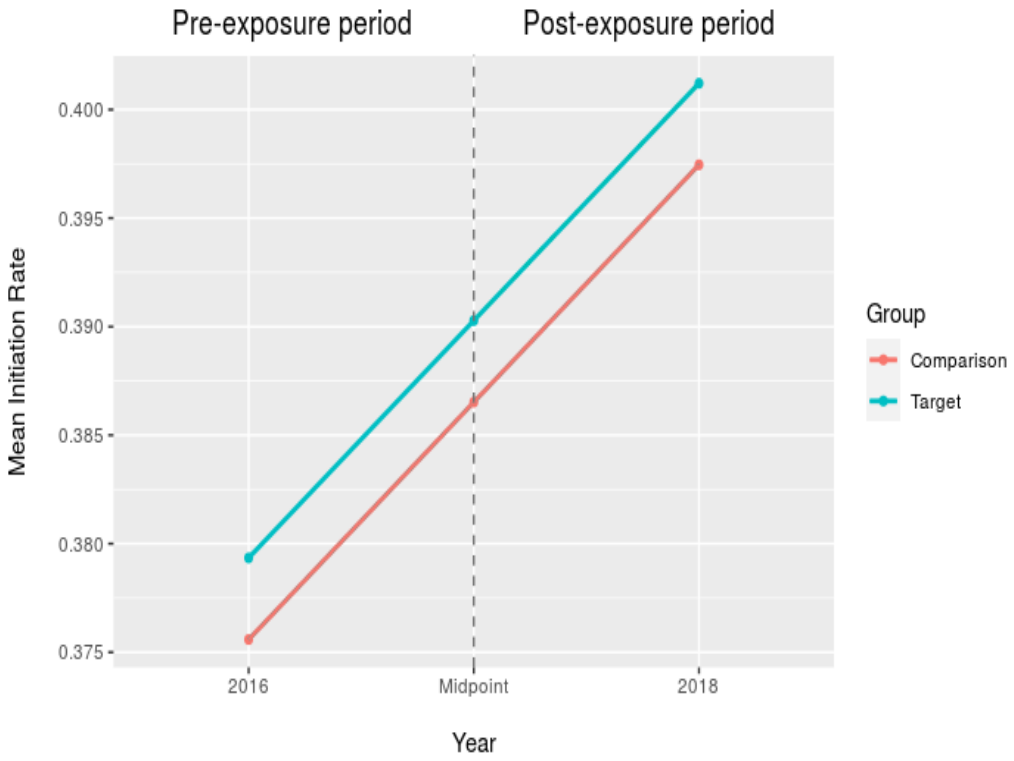


Table 44. Distribution of Engagement of Alcohol and Other Drug Dependence Treatment.

Year	Engagement of Treatment	Total Eligible Members	Percentage
2016	323	4,125	7.83%

2017	292	3,963	7.37%
2018	403	4,151	9.71%
2019	677	5,620	12.05%

Table 45. Distribution of Engagement of Alcohol and Other Drug Dependence Treatment by Group.

Year	Group	Engagement of Treatment	Total Eligible Members	Percentage
2016				
	Target	201	2,847	7.06%
	Comparison	122	1,278	9.55%
2017				
	Target	207	2,761	7.50%
	Comparison	85	1,202	7.07%
2018				
	Target	280	2,971	9.42%

	Comparison	231	1,761	10.42%
2019				
	Target	446	3,904	11.42%
	Comparison	231	1,716	13.46%

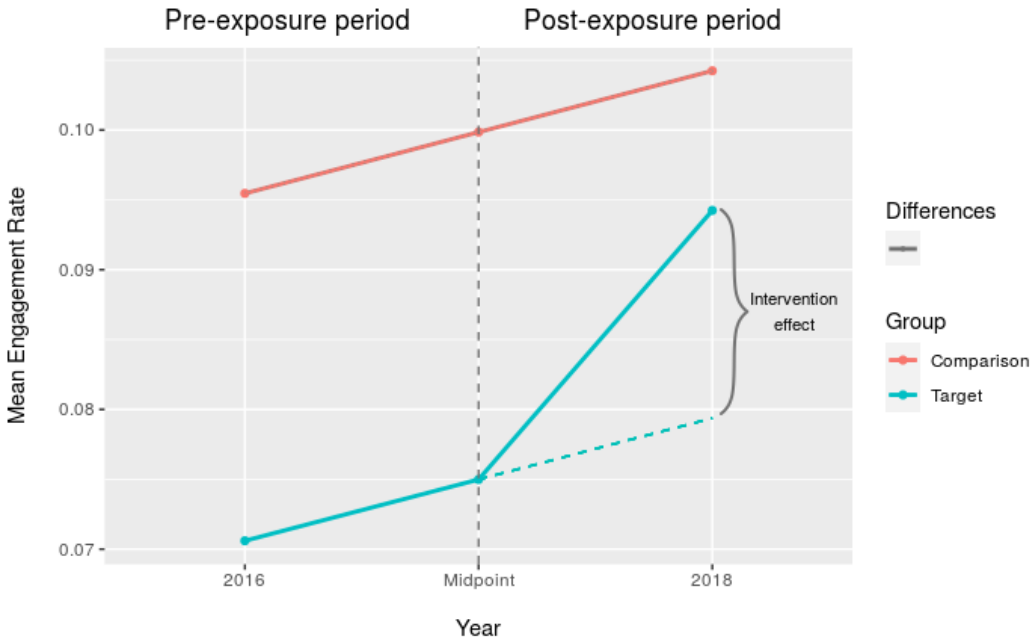
Tables 44 and 45 above show the percent of engagement of alcohol and other drug dependence treatment increasing each year. However, the comparison group had a decrease in engagement in 2017 and an increase for 2018 and 2019. As shown below in Table 46, both target and comparison have an increase in engagement of alcohol and other drug dependence treatment (2.36% and 0.88%, respectively). In 2016 and 2018, the engagement was higher in the comparison group compared to the target group. Overall, there is a 1.49% increase in the difference of the differences for engagement of alcohol and other drug dependence treatment in the target group compared to the comparison group. This difference was found to not be significant at the 0.05 level. Figure 4 shows the engagement change between groups from the pre-exposure period to the post-exposure period. In the post-exposure period, the dotted line for the target group represents the expected trend if there was no exposure and the solid lines represent the observed trends for each group.

Table 46. 5ifference in Differences of Engagement of Alcohol and Other Drug Dependence Treatment.

Variable	Target	Comparison	Difference
One-year engagement rate (2016)	7.06%	9.55%	-2.49%

One-year engagement rate (2018)	9.42%	10.42%	-1%
Change in one-year engagement rate	2.36%	0.88%	1.49%

Figure 4. Difference in Differences of Engagement of Alcohol and Other Drug Dependence Treatment



Percent of members who adhere to treatment of SUDs will increase.

Table 47. Distribution Continuity of Pharmacotherapy for OUD.

Year	Continuous Pharmacotherapy	Eligible members with OUD Diagnosis and at least one OUD medication claim	Percentage
2016	441	724	60.7%
2017	455	757	60.1%
2018	458	885	51.7%
2019	602	1,237	48.7%

Table 48. Distribution Continuity of Pharmacotherapy for OUD by Group.

Year	Group	Continuous Pharmacotherapy	Eligible members with OUD Diagnosis and at least one OUD medication claim	Percentage
2016				
	Target	359	593	60.5%
	Comparison	82	131	62.6%

2017				
	Target	369	601	61.4%
	Comparison	86	156	45.9%
2018				
	Target	369	691	53.4%
	Comparison	89	194	45.9%
2019				
	Target	487	960	50.7%
	Comparison	115	277	41.5%

Tables 47 and 48 above show the percent of continuity of pharmacotherapy decreasing each year. However, the target group had an increase in the continuity of pharmacotherapy in 2017 and a decrease for 2018 and 2019. As shown below in Table 49 below, both target and comparison groups show a decrease in continuity of pharmacotherapy. (-7.24% and –16.72%, respectively). In 2016, the continuity of pharmacotherapy was higher in the comparison group compared to the target group. However, in 2018, the continuity of pharmacotherapy was higher in the target group compared to the comparison group. Overall, there is a 9.48% increase in the difference of the differences for continuity of pharmacotherapy in the target group compared to the comparison group. This difference was found to not be significant at the 0.05 level. Figure 5 below shows the continuity of pharmacotherapy change between groups from the pre-exposure period to the post-exposure period. In the post-exposure period, the dotted line for the target group represents the expected trend if there was no exposure and the solid lines represent the observed trends for each group.

Table 49. Difference in Differences of Continuity of Pharmacotherapy for OUD.

Variable	Target	Comparison	Difference
One-year pharmacotherapy rate (2016)	60.24%	62.6%	-1.95%
One-year pharmacotherapy rate (2018)	53.4%	45.88%	7.52%
Change in one-year pharmacotherapy rate	-7.24%	-16.72%	9.48%

Figure 5. Difference in Differences of Continuity of Pharmacotherapy for OUD

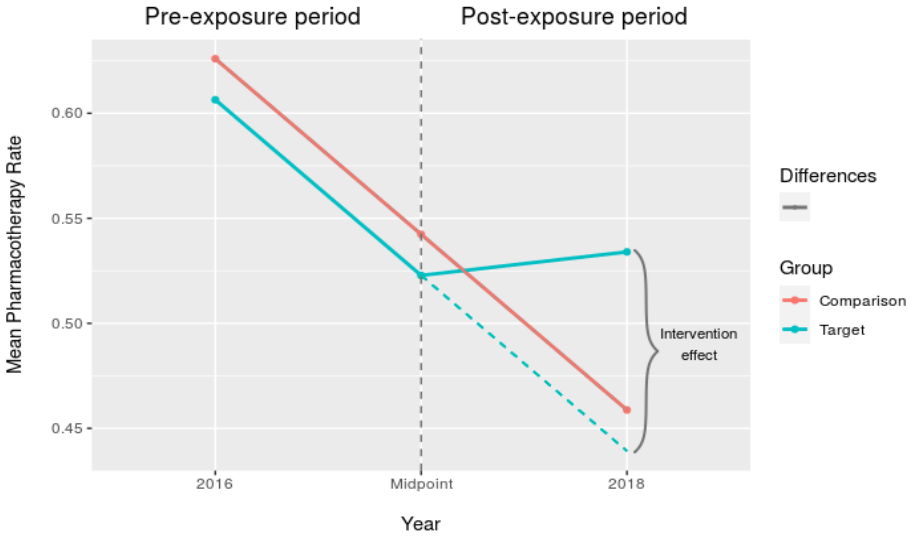


Table 50. Distribution of any SUD treatment Service, Facility Claim, or Pharmacy Claim.

Year	Any SUD Treatment	Total Eligible Members	Percentage
2016	6,549	260,943	2.51%
2017	6,235	249,423	2.50%
2018	6,061	242,433	2.50%
2019	6,294	242,077	2.60%

Table 51. Distribution of any SUD Treatment Service, Facility Claim, or Pharmacy Claim by Group.

Year	Group	Any SUD Treatment	Total Eligible Members	Percentage
2016				
	Target	4,635	183,208	2.53%
	Comparison	1,905	77,735	2.45%
2017				
	Target	4,286	175,636	2.44%
	Comparison	1,970	73,796	2.67%
2018				
	Target	4,168	170,106	2.45%
	Comparison	1,895	72,327	2.62%
2019				
	Target	4,214	169,901	2.48%

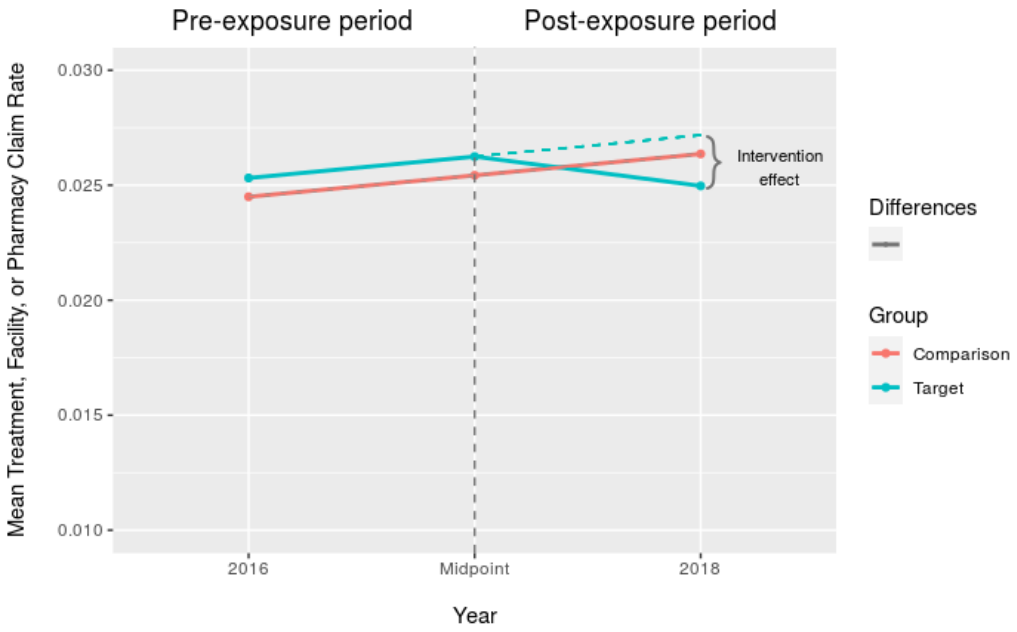
	Comparison	2,071	72,176	2.87%

Tables 50 and 51 above show the percentage of any SUD treatment service, facility claim, or pharmacy claim decreasing in 2017 and increasing in 2019. However, the target group also had an increase in 2018 while the comparison group had an increase in every year except 2018. As shown in Table 52 below, the target group shows a decrease in any SUD treatment service, facility claim, or pharmacy claim (0.08%) and the comparison group shows an increase in any SUD treatment service, facility claim, or pharmacy claim (0.17%). In 2016, the SUD treatment service, facility claim, or pharmacy claims were higher in the target group compared to the comparison group. However, in 2018, the SUD treatment service, facility claim, or pharmacy claims were higher in the comparison group compared to the target group. Overall, there is a 0.25% decrease in the difference of the differences for SUD treatment service, facility claim, or pharmacy claims in the target group compared to the comparison group. This difference was found to not be statistically significant at the 0.05 level. Figure 6 shows the SUD treatment service, facility claim, or pharmacy claim change between groups from the pre-exposure period to the post-exposure period. In the post-exposure period, the dotted line for the target group represents the expected trend if there was no exposure and the solid lines represent the observed trends for each group.

Table 52. Difference in Differences of Receiving any SUD treatment service, facility claim, or pharmacy claim.

Variable	Target	Comparison	Difference
One-year admission rate (2016)	2.53%	2.45%	0.08%
One-year admission rate (2018)	2.45%	2.64%	-0.17%
Change in one-year admission rate	-0.08%	0.17%	-0.25%

Figure 6. Difference in Differences of Receiving any SUD Treatment Service, Facility Claim, or Pharmacy Claim.



Rate of emergency department and inpatient visits will decrease.

Table 53. Distribution of Emergency Department Follow-up within 7 Days.

Year	Follow-up Within 7 Days	Total Eligible Members with an Emergency Department Visit	Percentage
2016	68	514	13.23%

2017	58	469	12.37%
2018	68	552	12.32%
2019	141	980	14.39%

Table 54. Distribution of Emergency Department Follow-up within 7 Days by Group.

Year	Group	Follow-up Within 7 Days	Total Eligible Members with an Emergency Department Visit	Percentage
2016				
	Target	51	367	13.90%
	Comparison	17	147	11.56%
2017				
	Target	45	353	12.75%
	Comparison	13	116	11.21%
2018				
	Target	57	434	13.13%

	Comparison	11	118	9.32%
2019				
	Target	94	729	12.89%
	Comparison	47	251	18.73%

Tables 53 and 54 above show the percent of emergency department follow-up within 7 days decreasing each year except 2019. However, the target group had an increase in the emergency department follow-up in 2018 and a decrease for 2019. As shown below in Table 55 below, both target and comparison groups show a decrease in emergency department follow-up within 7 days (-0.76% and –2.24%, respectively). In 2016 and 2018, the emergency department follow-up within 7 days was higher in the target group compared to the comparison group. Overall, there is a 1.48% increase in the difference of the differences for emergency department follow-up within 7 days in the target group compared to the comparison group. This difference was found to not be statistically significant at the 0.05 level. Figure 7 shows the emergency department follow up within 7 days change between groups from the pre-exposure period to the post-exposure period. In the post-exposure period, the dotted line for the target group represents the expected trend if there was no exposure and the solid lines represent the observed trends for each group.

Table 55. Difference in Differences of Emergency Department Follow-up within 7 Days.

Variable	Target	Comparison	Difference
One-year follow-up rate (2016)	13.9%	11.56%	2.33%

One-year follow-up rate (2018)	13.13%	9.32%	3.81%
Change in one-year follow-up rate	-0.76%	-2.24%	1.48%

Figure 7. Difference in Differences of Emergency Department Follow-up within 7 Days.

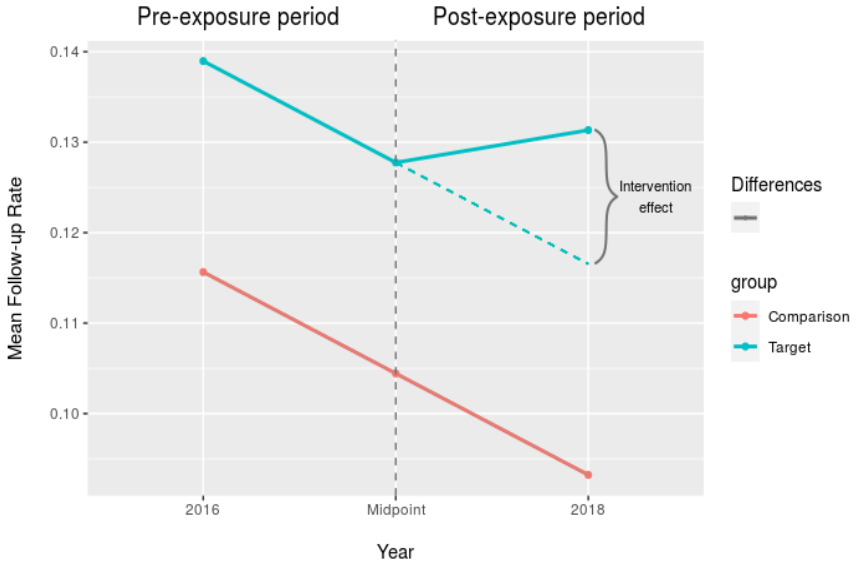


Table 56. Distribution of Emergency Department Follow-up within 30 Days.

Year	Follow-up Within 30 Days	Total Eligible Members with an Emergency Department Visit	Percentage
2016	101	514	19.65%

2017	80	469	17.06%
2018	106	552	19.20%
2019	196	980	20.00%

Table 57. Distribution of Emergency Department Follow-up within 30 Days by Group.

Year	Group	Follow-up Within 30 Days	Total Eligible Members with an Emergency Department Visit	Percentage
2016				
	Target	76	367	20.71%
	Comparison	25	147	17.01%
2017				
	Target	61	353	17.28%
	Comparison	19	116	16.38%
2018				
	Target	86	434	19.82%

	Comparison	20	118	16.95%
2019				
	Target	131	729	17.97%
	Comparison	65	251	25.90%

Tables 56 and 57 above show the percentage of emergency department follow-up for 30 days increasing each year except 2017. However, the target group also had a decrease in the emergency department follow-up in 2019. As shown below in Table 57 below, both target and comparison groups show a decrease in emergency department follow-up within 30 days (-0.89% and –0.06%, respectively). In 2016 and 2018, the emergency department follow-up within 30 days was higher in the target group compared to the comparison group. Overall, there is a 0.84% decrease in the difference of the differences for emergency department follow-up within 30 days in the target group compared to the comparison group. This difference was found to not be statistically significant at the 0.05 level. Figure 8 shows the emergency department follow up within 30 days change between groups from the pre-exposure period to the post-exposure period. In the post-exposure period, the dotted line for the target group represents the expected trend if there was no exposure and the solid lines represent the observed trends for each group.

Table 58. Difference in Differences of Emergency Department Follow-up within 30 Days.

Variable	Target	Comparison	Difference
One-year follow-up rate (2016)	20.71%	17.01%	3.7%

One-year follow-up rate (2018)	19.82%	16.95%	2.87%
Change in one-year follow-up rate	-0.89%	-0.06%	-0.84%

Figure 8. Difference in Differences of Emergency Department Follow-up within 30 Days.

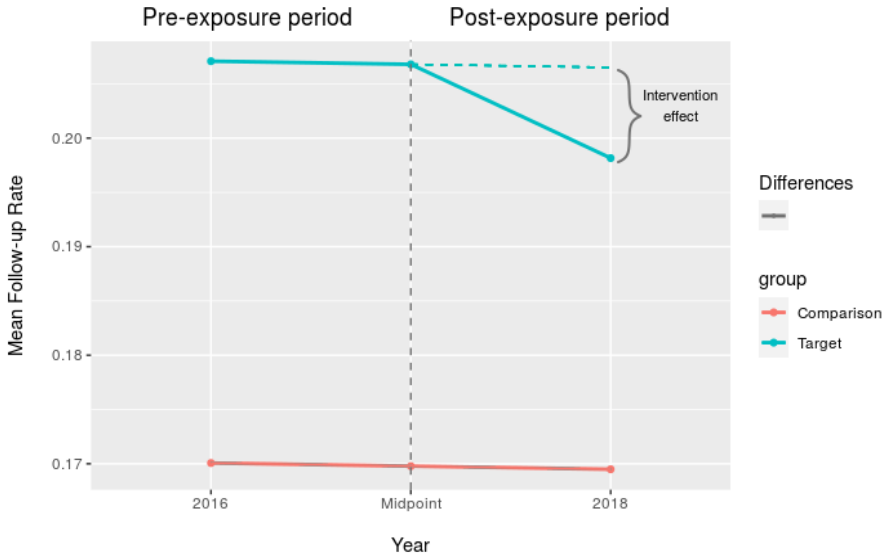


Table 59. Distribution of OUD Inpatient Stays.

Year	SUD Inpatient Admission	Total Eligible Members	Percentage
2016	3,707	260,943	1,42%

2017	3,552	249,423	1.42%
2018	2,383	242,433	1.35%
2019	5,153	242,077	2.13%

Table 60. Distribution of OUD Inpatient Stays by Group.

Year		Group	SUD Inpatient Admission	Total Eligible Members	Percentage
2016					
		Target	2,623	183,208	1.43%
		Comparison	1,084	77,735	1.39%
2017					
		Target	2,451	175,636	1.40%
		Comparison	1,101	73,796	1.49%
2018					
		Target	2,286	170,106	1.34%

		Comparison	997	72,327	1.38%
2019					
		Target	3,562	169,901	2.10%
		Comparison	1,591	72,176	2.20%

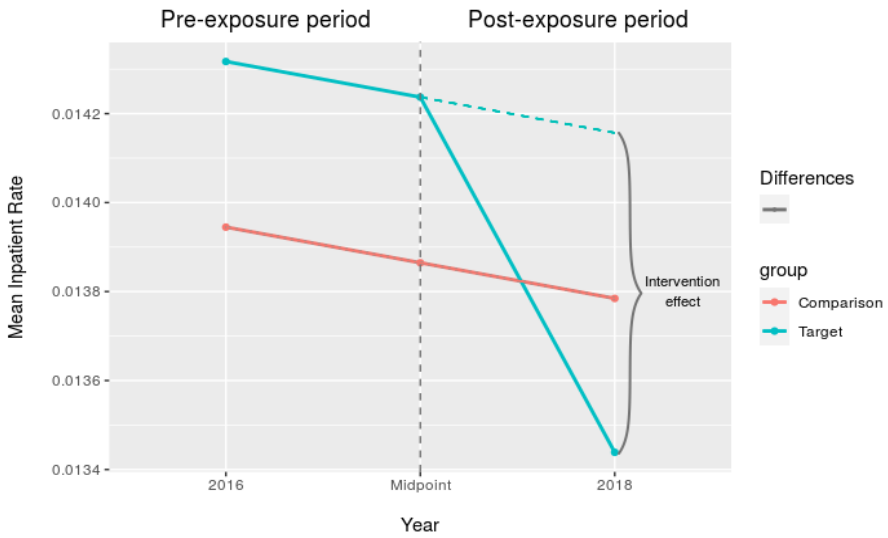
Tables 59 and 60 above show the percentage of inpatient admission for OUD decreasing from 2016 to 2018 and increasing for 2019. However, the target group had a decrease in the inpatient admission for OUD for each year except 2019 while the comparison group also shows an increase in 2017. As shown below in Table 60 below, both target and comparison groups show a decrease in inpatient admissions for OUD (0.09% and 0.02%, respectively). In 2016, inpatient admission for OUD was higher in the target group compared to the comparison group. However, in 2018, the inpatient admission of OUD was higher in the comparison group compared to the target group. Overall, there is a 0.07% decrease in the difference of the differences for inpatient admission of OUD in the target group compared to the comparison group. This difference was found to not be statistically significant at the 0.05 level. Figure 9 below, shows inpatient admission for OUD change between groups from the pre-exposure period to the post-exposure period. In the post-exposure period, the dotted line for the target group represents the expected trend if there was no exposure and the solid lines represent the observed trends for each group.

Table 61. Difference in Differences of Inpatient Admission of OUD.

Variable	Target	Comparison	Difference
One-year admission rate (2016)	1.43%	1.39%	0.04%

One-year admission rate (2018)	1.34%	1.38%	-0.03%
Change in one-year admission rate	-0.09%	-0.02%	-0.07%

Figure 9. Difference in Differences of Inpatient Admission of OUD.



Percent of members with SUD who experience care for comorbid conditions will increase.

Table 62. Distribution of Access to Preventive/Ambulatory Health Services (AAP).

Year	AAP	Total Eligible Members with SUD and Continual Enrollment	Percentage

2016	6,943	8,146	85.23%
2017	7,027	8,324	85.61%
2018	6,949	7,935	87.57%
2019	10,568	12,972	81.47%

Table 63. Distribution of Access to Preventive/Ambulatory Health Services (AAP) by Group.

Year	Group	AAP	Total Eligible Members with SUD and Continual Enrollment	Percentage
2016				
	Target	4,852	5,719	84.84%
	Comparison	2,091	2,427	86.16%
2017				
	Target	4,818	5,656	85.18%
	Comparison	2,076	2,397	86.61%
2018				

	Target	4,885	5,597	87.28%
	Comparison	2,064	2,338	88.28%
2019				
	Target	7,322	9,074	80.69%
	Comparison	3,246	3,898	83.27%

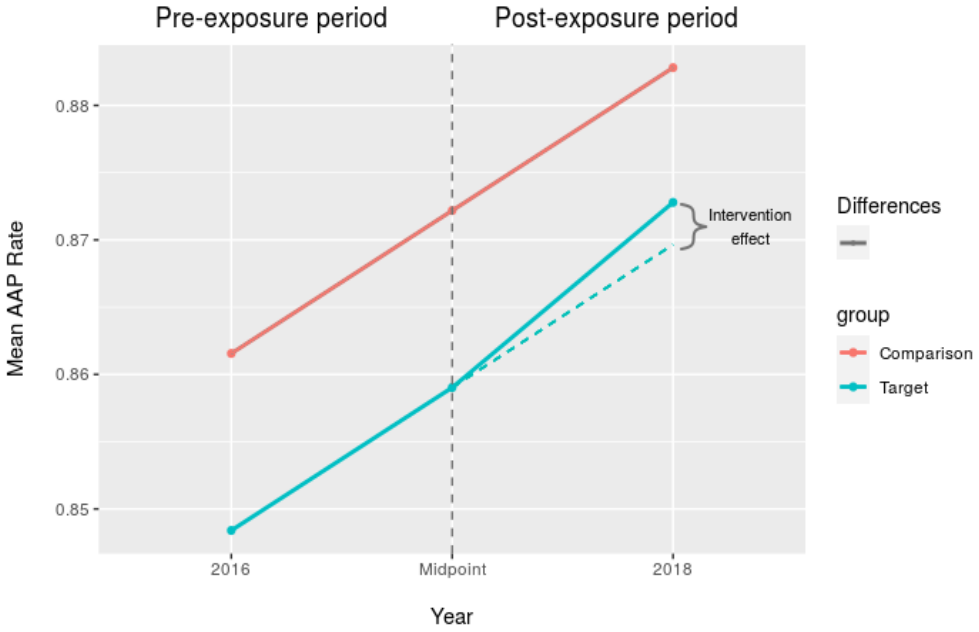
Tables 62 and 63 above show the percentage access to preventive / ambulatory health services (AAP) for OUD increasing for every year except 2019. As shown below in Table 63 below, both target and comparison groups show an increase in AAP (2.44% and 2.12%, respectively). In 2016 and 2018, the AAP was higher in the comparison group compared to the target group. Overall, there is a 0.31% increase in the difference of the differences for AAP in the target group compared to the comparison group. This difference was found to not be significant at the 0.05 level. Figure 10 below, shows the AAP change between groups from the pre-exposure period to the post-exposure period. In the post-exposure period, the dotted line for the target group represents the expected trend if there was no exposure and the solid lines represent the observed trends for each group.

Table 64. Difference in Differences of Access to Preventive/Ambulatory Health Services.

Variable	Target	Comparison	Difference

One-year access rate (2016)	84.84%	86.16%	-1.32%
One-year access rate (2018)	87.28%	88.28%	-1%
Change in one-year access rate	2.44%	2.12%	0.31%

Figure 10. Difference in Differences of Access to Preventive/Ambulatory Health Services.

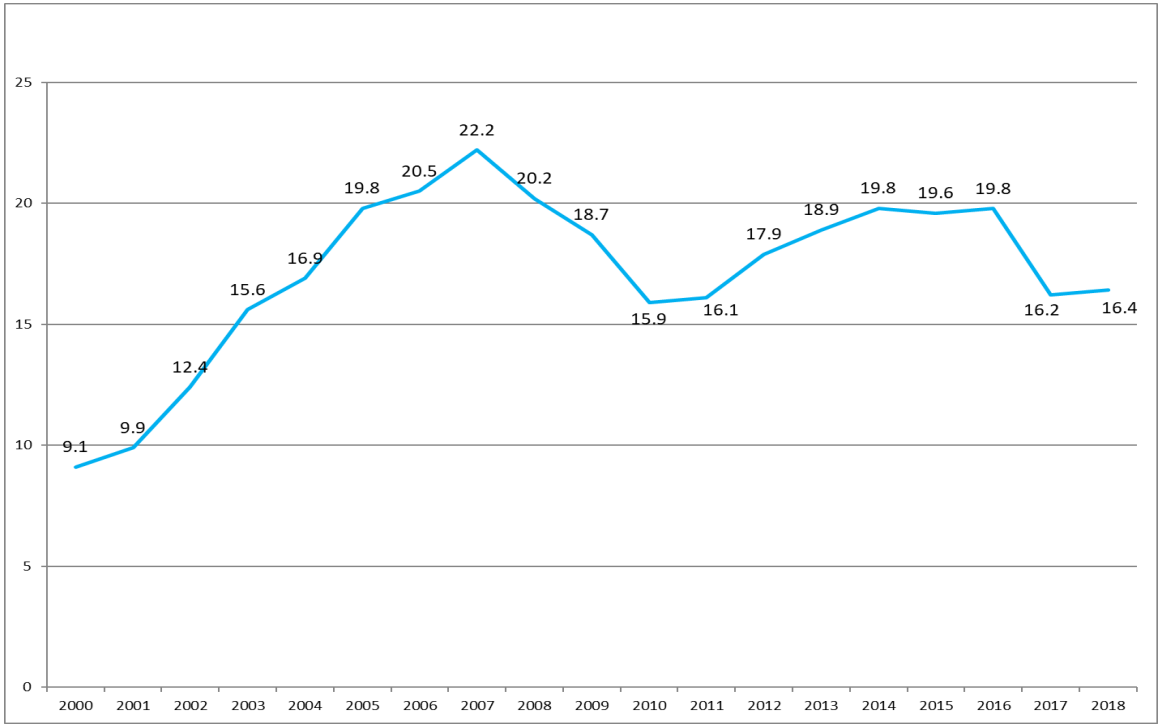


Rate of overdose deaths due to opioids will decrease.

Utah has experienced a sharp increase in opioid related deaths since 2000 [9]. The Division of Substance Abuse and Mental Health (DSAMH has statutory oversight of substance abuse and mental health treatment services statewide through local county authority programs. While some SUD services have been available to Medicaid members statewide, this waiver expands the continuum of care to include SUD residential treatment in Institution for Mental Disease (IMD) for eligible individuals. This adds a critical service to address the needs of Medicaid members.[10]

Recent data suggests that the number of deaths due to opioids peaked initially in 2007, then showed a promising decreasing trend through 2010, before increasing dramatically once more from 2011 through 2017 (see Figure 11 below).

Figure 11. Rate of Opioid Deaths in Utah, Adults 18+ Years, per 100,000 Population, 2000-2018.



Additionally, in response to the challenges related to opioid-related deaths, UDOH established an Opioid Fatality Review Committee (OFRC) in January 2018 to conduct in-depth reviews on select opioid deaths in the state. The purpose of a fatality review is to gather accurate data about events leading up to and surrounding an opioid-related death and make recommendations to prevent future fatalities. The work of the OFCR and others, including partner agencies such as DSAMH has been instrumental in the establishment of local Mobile Crisis Outreach Teams. While these teams have existed in the major urban counties in the state, additional rural areas have begun to operate MCOT services. One of the priority areas of these MCOT's is to follow up with patients who may be considered high risk of suicide when released from psychiatric facilities or hospital emergency departments. The purpose of the follow-up is to ensure a "warm handoff" takes place, so the patient is connected to community-based mental health services during a period of potential need.

Table 65. SUD-related Overdose Deaths Among Medicaid Beneficiaries.

Year	Overdose deaths	Rate of overdose deaths per 1,000
2018	159	0.42
2019	161	0.42
2020	210	0.52

It appears the overall opioid overdose deaths in the general population may have reached its high point followed by a potential downward trend that is encouraging. The timing of Medicaid expansion in Utah and the limited specific data points among Medicaid beneficiaries (see Table 65 above) cannot yield a meaningful interpretation of the status of SUD-related overdose deaths at this time.

Will the number of individuals receiving emergency department services for substance use disorder decrease in waiver implementing counties?

All measures met the assumptions, were analyzed with CITS, and the results are shown in the tables (as rates or percentages) and figures (displayed as rates) below. SUD emergency department visits and SUD inpatient services were not found to be significant at the 0.05 level. However, SUD outpatient services and SUD withdrawal management services were found to be significant at the 0.05 level.

Table 66. Distribution of SUD Emergency Department Visit per 1,000 Medicaid Beneficiaries.

Year	SUD Emergency Department Visit	Total Eligible Members	SUD ED Visits per 1,000 Medicaid Beneficiaries
2015	3,055	98,760	39.0
2016	9,436	139,816	67.5
2017	9,543	139,204	68.6
2018	11,239	138,424	81.2
2019	18,487	174,144	106.2
2020	15,267	162,945	93.7

Table 67. Distribution of SUD Emergency Department Visit per 1,000 Medicaid Beneficiaries by Group.

Year	Group	SUD Emergency Department Visit	Total Eligible Members	SUD ED Visits per 1,000 Medicaid Beneficiaries
2015				
	Target	1,488	37,630	39.5
	Comparison	1,567	37,630	25.6
2016				
	Target	4,234	52,497	80.7
	Comparison	5,202	87,319	59.6
2017				
	Target	4,223	52,091	81.1
	Comparison	5,320	87,113	61.1
2018				
	Target	5,266	52,267	100.8

	Comparison	5,973	86,157	69.3
2019				
	Target	8,384	66,454	126.2
	Comparison	10,103	107,690	93.8
2020				
	Target	6,938	62,290	111.4
	Comparison	8,329	100,655	82.7

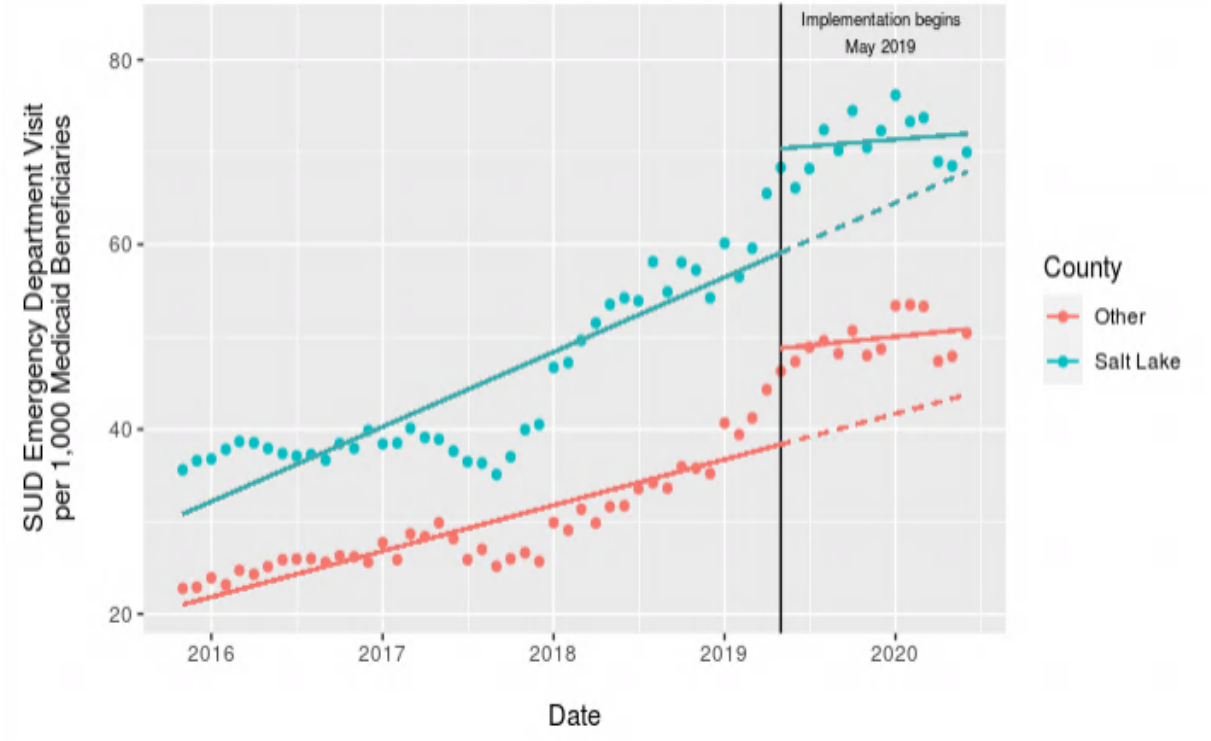
*Data only available for first 6 months of 2020.

Tables 66 and 67 above shows the rate of SUD emergency department visits per 1,000 Medicaid beneficiaries increasing each year except for 2020. However, this decrease could be due to the data only including the first six months of 2020. As shown below in Table 68, both target and comparison groups show an increase in SUD emergency department visits (31.34 per 1,000 Medicaid beneficiaries and 27.38 per 1,000 Medicaid beneficiaries, respectively). Before and after implementation, the SUD emergency department visit rate was higher in the target group compared to the comparison group. Overall, there is a 3.96 per 1,000 Medicaid beneficiaries increase in the difference of the difference for SUD emergency department visit rates in the target group compared to the comparison group. This difference was not found to be significant at the 0.05 level. Figure 12 below shows the SUD emergency department visit rate between groups from the pre-implementation period to the post-implementation period. The dotted lines represent the expected trend if there were no implementation, and the solid lines represent the observed trends for each group.

Table 68. Difference in Differences of SUD Emergency Department Visit Rates by Group and Time.

Variable	Target	Comparison	Difference
SUD ED services per 1,000 Medicaid beneficiaries before implementation	52.09	45.54	6.54
SUD ED service per 1,000 Medicaid beneficiaries after implementation	83.43	72.92	10.51
Change in SUD ED service rate	31.34	27.38	3.96

Figure 12. SUD Emergency Department Visits per 1,000 Medicaid Beneficiaries by Month and County



Will ED expenditures decrease for substance use disorder services in implementing counties?

Table 69. Distribution of SUD Emergency Department Cost per Person.

Year	SUD Emergency Department Visit	Eligible Medicaid Beneficiaries	Mean SUD ED cost per person

2015	3,619	305,140	$2,507.72
2016	11,308	397,499	$3,039.47
2017	11,365	388,166	$2,402.91
2018	13,306	374,374	$3,626.44
2019	21,436	398,535	$3,817.09
2020	17,351	356,255	$4,431.20

Table 70. Distribution of SUD Emergency Department Cost per Person.

Year	Group	SUD Emergency Department Visit	Eligible Medicaid Beneficiaries	Mean SUD ED cost per person
2015				
	Target	1,753	115,528	$2,837.62
	Comparison	1,873	190,237	$2,227.27
2016				
	Target	5,163	152,759	$3,052.29

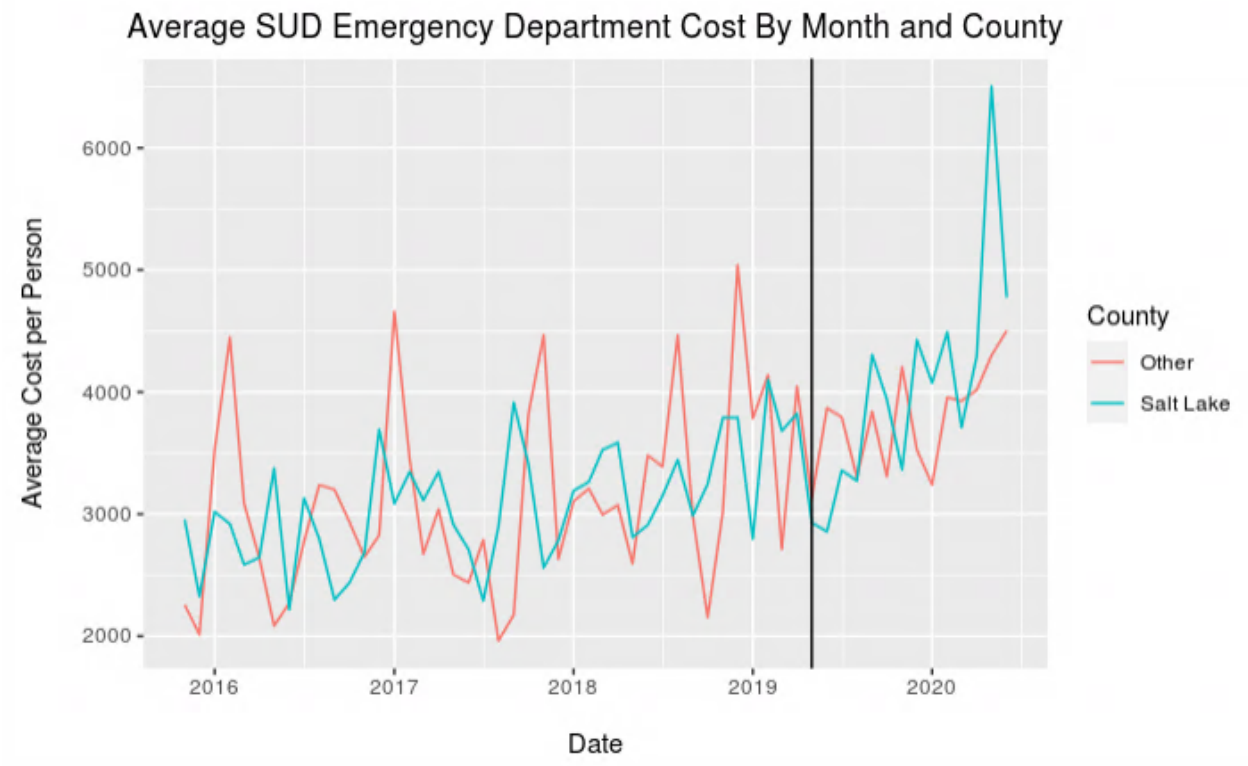
	Comparison	6,294	252,746	$3,027.81
2017				
	Target	5,118	148,280	$3,492.57
	Comparison	6,387	247,676	$3,292.92
2018				
	Target	6,380	142,556	$3,623.54
	Comparison	7,160	239,067	$3,604.15
2019				
	Target	10,046	152,323	$3,824.02
	Comparison	11,828	254,097	$3,776.57
2020				
	Target	8,088	134,741	$4,875.97
	Comparison	9,492	225,278	$4,035.70

Tables 69 and 70 above shows the cost of SUD emergency department visits per person increasing each year and in each group. As shown below in Table 71, both target and comparison groups show an increase in SUD emergency department cost per person ($564.61 and $573.06, respectively). Before and after implementation, the SUD emergency department visit cost per person was higher in the target group compared to the comparison group. Overall, there is a $8.45 increase in the difference of the difference for SUD emergency department visit costs per person in the target group compared to the comparison group. This difference was not found to be significant at the 0.05 level. Figure 13 shows the SUD emergency department visit rate between groups from the pre-implementation period to the post-implementation period.

Table 71. Difference in Differences of SUD Emergency Department Visit Cost per Person.

Variable	Target	Comparison	Difference
ED cost before implementation	$2,480.04	$2,434.13	$45.91
ED cost after implementation	$3,044.65	$3,007.19	$37.46
Change in ED cost rate	$564.61	$573.06	-$8.45

Figure 13. SUD Emergency Department Visit Costs per person by Month and County.



Will the number of inpatient hospitalization days for SUD services decrease in waiver implementing counties?

Table 72. Distribution of SUD Inpatient Stays per 1,000 Medicaid Beneficiaries.

Year	SUD Inpatient Stays	Total Eligible Members	Inpatient Stays per 1,000 Medicaid Beneficiaries
2015	570	187,737	3.0
2016	4,028	1,136,668	3.5
2017	4,023	1,125,573	3.6
2018	4,411	1,139,212	3.9
2019	7,581	1,363,102	5.6
2020*	5,020	823,170	6.1

*Data for 2020 only includes the first 6 months.

Table 73. Distribution of SUD Inpatient Stays per 1,000 Medicaid Beneficiaries by Group.

Year	Group	SUD Inpatient Stays	Total Eligible Members	Inpatient Stays per 1,000 Medicaid Beneficiaries
2015				
	Target	285	71,614	4.0

	Comparison	285	116,123	2.5
2016				
	Target	2,024	432,485	4.6
	Comparison	2,024	704,183	2.9
2017				
	Target	1,896	427,743	4.4
	Comparison	2,004	697,830	3.0
2018				
	Target	2,248	437,207	5.1
	Comparison	2,163	702,005	3.1
2019				
	Target	3,648	521,893	7.0
	Comparison	3,933	841,209	4.7
2020*				

	Target	2,381	314,677	7.6
	Comparison	2,639	508,493	5.2

*Data for 2020 only includes the first 6 months.

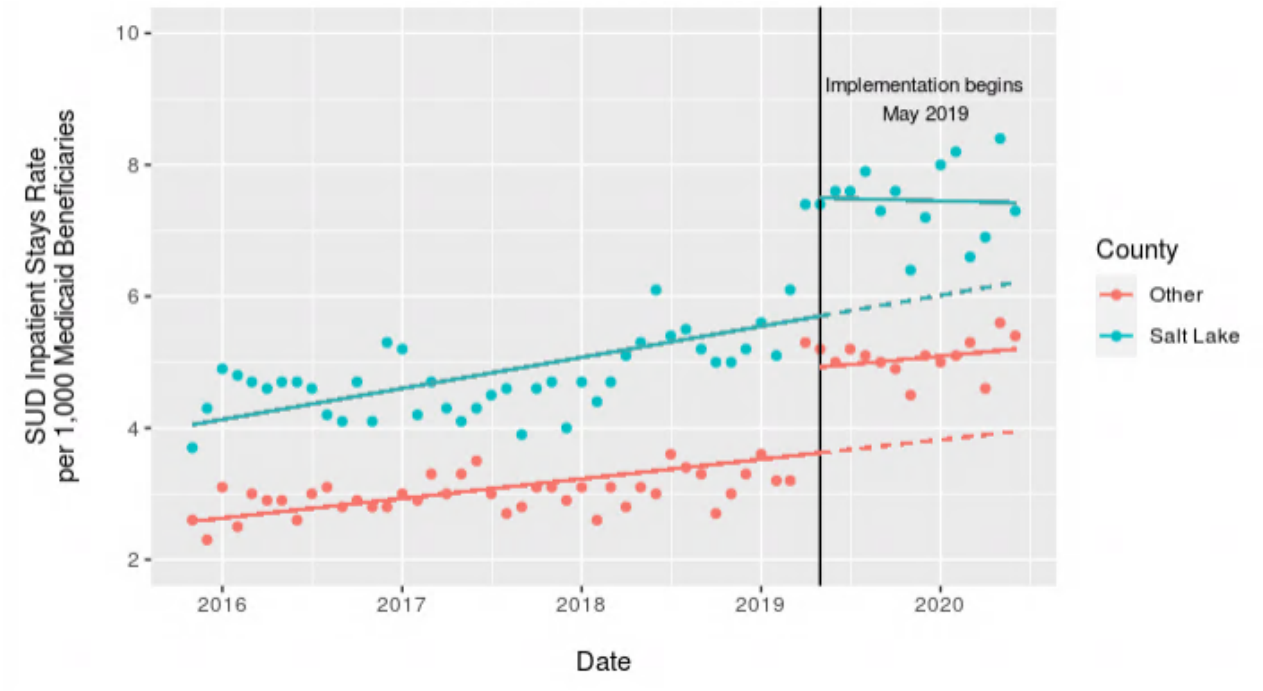
Tables 72 and 73 above shows the rate of SUD inpatient stays per 1,000 Medicaid beneficiaries increasing each year through 2019. Data for 2020 only included the first six months. As shown below in Table 74 both target and comparison groups show an increase in SUD inpatient stays (2.58 per 1,000 Medicaid beneficiaries and 1.96 per 1,000 Medicaid beneficiaries, respectively). Before and after implementation, the SUD inpatient stay rate was higher in the target group compared to the comparison group. Overall, there is a 0.63 per 1,000 Medicaid beneficiaries increase in the difference of the difference for SUD inpatient stay rates in the target group compared to the comparison group. This difference was not found to be significant at the 0.05 level. Figure 14 shows the SUD inpatient services per 1,000 Medicaid beneficiaries between groups from the pre-implementation period to the post-implementation period. The dotted lines represent the expected trend if there was no implementation, and the solid lines represent the observed trends for each group.

Table 74. Difference in Differences of SUD Inpatient Stay Rates.

Variable	Target	Comparison	Difference
SUD inpatient services per 1,000 Medicaid beneficiaries before implementation	4.88	3.10	1.77
SUD inpatient services per 1,000 Medicaid	7.46	5.06	2.40

beneficiaries after implementation			
Change in SUD inpatient services per 1,000 Medicaid beneficiaries	2.58	1.96	0.63

Figure 14. SUD Inpatient Stays per 1,000 Medicaid Beneficiaries by Month and County.



Will the number of outpatient (OP), intensive outpatient (IOP), or partial hospitalization visits for SUD services increase in Salt Lake County?

Table 75. Distribution of Outpatient Services for Eligible Members with SUD Diagnosis.

Year	SUD Outpatient Service	Eligible Members with SUD Diagnosis	Percentage
2015	1,620	3,815	42.46%
2016	5,194	11,295	45.98%
2017	5,620	11,514	48.81%
2018	7,157	13,598	52.63%
2019	12,140	22,300	54.44%
2020*	9,738	18,475	52.71%

*Data for 2020 only includes the first 6 months.

Table 76. Distribution of Outpatient Services for Eligible Members with SUD Diagnosis by Group.

Year	Group	SUD Outpatient Service	Eligible Members with SUD Diagnosis	Percentage
2015				
	Target	779	1,853	42.04%
	Comparison	841	1,962	42.86%
2016				
	Target	2,311	5,031	45.94%
	Comparison	2,883	6,264	46.02%
2017				
	Target	2,256	5,074	44.46%
	Comparison	3,364	6,440	52.24%
2018				
	Target	3,102	6,286	49.35%
	Comparison	4,055	7,312	55.46%

2019				
	Target	5,294	10,025	52.81%
	Comparison	6,846	12,275	55.77%
2020*				
	Target	4,313	8,346	51.68%
	Comparison	5,425	10,129	53.56%

*Data for 2020 only includes the first 6 months.

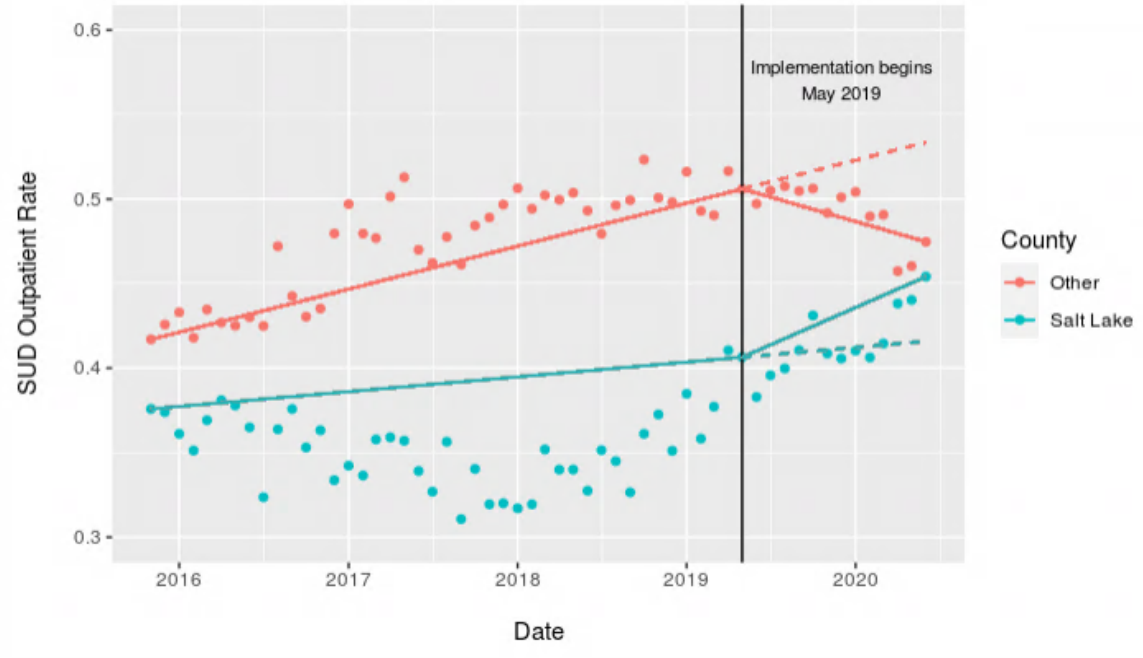
Tables 75 and 76 above shows the rate of SUD outpatient service increasing each year through 2019. Data for 2020 only included the first six months. As shown below in Table 77, both target and comparison groups show an increase in SUD outpatient services (6.27% and 1.46%, respectively). Before and after implementation, the SUD outpatient service rate was higher in the comparison group compared to the target group. Overall, there is a 4.81% increase in the difference of the difference for SUD outpatient service rates in the target group compared to the comparison group. This difference was found to be significant at the 0.05 level. Figure 15 shows the SUD outpatient service rate between groups from the pre-implementation period to the post-implementation period. The dotted lines represent the expected trend if there were no implementation, and the solid lines represent the observed trends for each group.

Table 77. Difference in Differences of SUD Inpatient Stay Rates.

Variable	Target	Comparison	Difference
SUD outpatient rate before implementation	35.48%	48.17%	-12.68%

SUD outpatient rate after implementation	41.75%	49.62%	-7.88%
Change in SUD outpatient rate	6.27%	1.46%	4.81%

Figure 15. SUD Outpatient Services by Month and County.



Additional SUD Research Question: Will the number of beneficiaries who utilize withdrawal management services increase in implementing counties?

Table 78. Distribution of SUD Withdrawal Management Services for Eligible Members with SUD Diagnosis.

Year	SUD Withdrawal Management Service	Eligible Members with SUD Diagnosis	Percentage
2015	76	3,815	1.99%
2016	310	11,295	2.74%
2017	286	11,514	2.48%
2018	296	13,598	2.18%
2019	1,153	22,300	5.17%
2020*	909	18,475	4.92%

*Data for 2020 only includes the first 6 months.

Table 79. Distribution of SUD Withdrawal Management Services for Eligible Members with SUD Diagnosis.

Year	Group	SUD Withdrawal Management Service	Eligible Members with SUD Diagnosis	Percentage
2015				
	Target	47	1,853	2.54%

	Comparison	29	1,962	2.54%
2016				
	Target	163	5,031	3.24%
	Comparison	147	6,264	2.35%
2017				
	Target	128	5,074	2.52%
	Comparison	158	6,440	2.45%
2018				
	Target	148	6,286	2.35%
	Comparison	148	7,312	2.02%
2019				
	Target	847	10,025	8.45%
	Comparison	306	12,275	2.49%
2020*				

	Target	634	8,346	7.60%
	Comparison	275	10,129	2.71%

*Data for 2020 only includes the first 6 months.

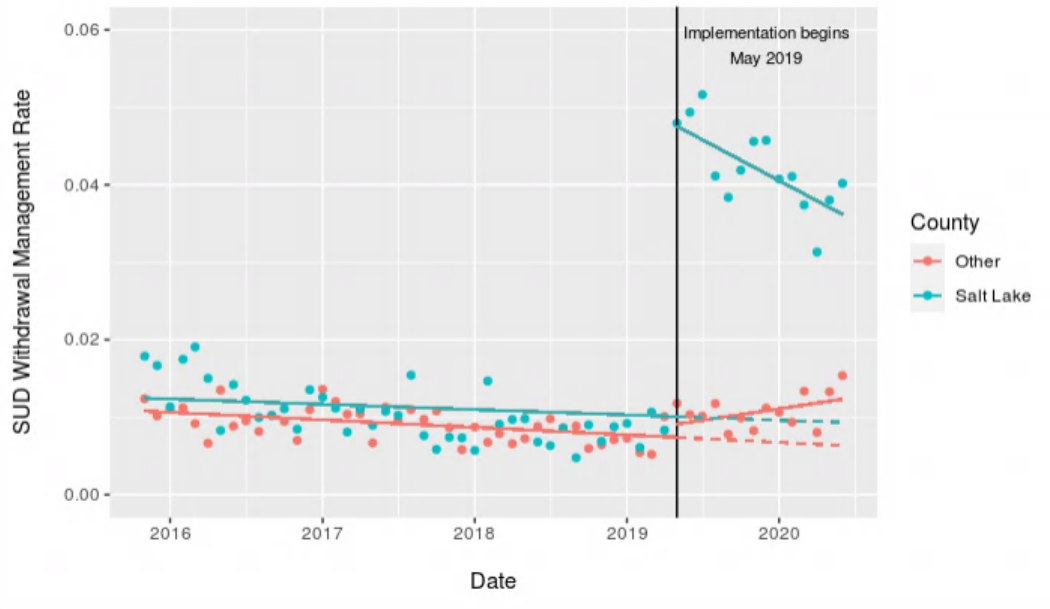
Tables 78 and 79 above shows the rate of SUD withdrawal management service increasing each year through 2019. Data for 2020 only included the first six months. As shown below in Table 80, both target and comparison groups show an increase in SUD withdrawal management services (3.08% and 0.31%, respectively). Before and after implementation, the SUD withdrawal management service rate was higher in the target group compared to the comparison group. Overall, there is a 2.78% increase in the difference of the difference for SUD withdrawal management service rates in the target group compared to the comparison group. This difference was found to be significant at the 0.05 level. Figure 16 shows the SUD withdrawal management service rate between groups from the pre-implementation period to the post-implementation period. The dotted lines represent the expected trend if there were no implementation, and the solid lines represent the observed trends for each group.

Table 80. Difference in Differences of SUD Withdrawal Management Stay Rates.

Variable	Target	Comparison	Difference
SUD withdrawal management rate before implementation	1.14%	0.81%	0.33%
SUD withdrawal management rate after implementation	3.63%	0.88%	2.75%

Change in SUD withdrawal management rate	2.49%	0.07%	2.42%

Figure 16. SUD Withdrawal Management Services by Month and County.



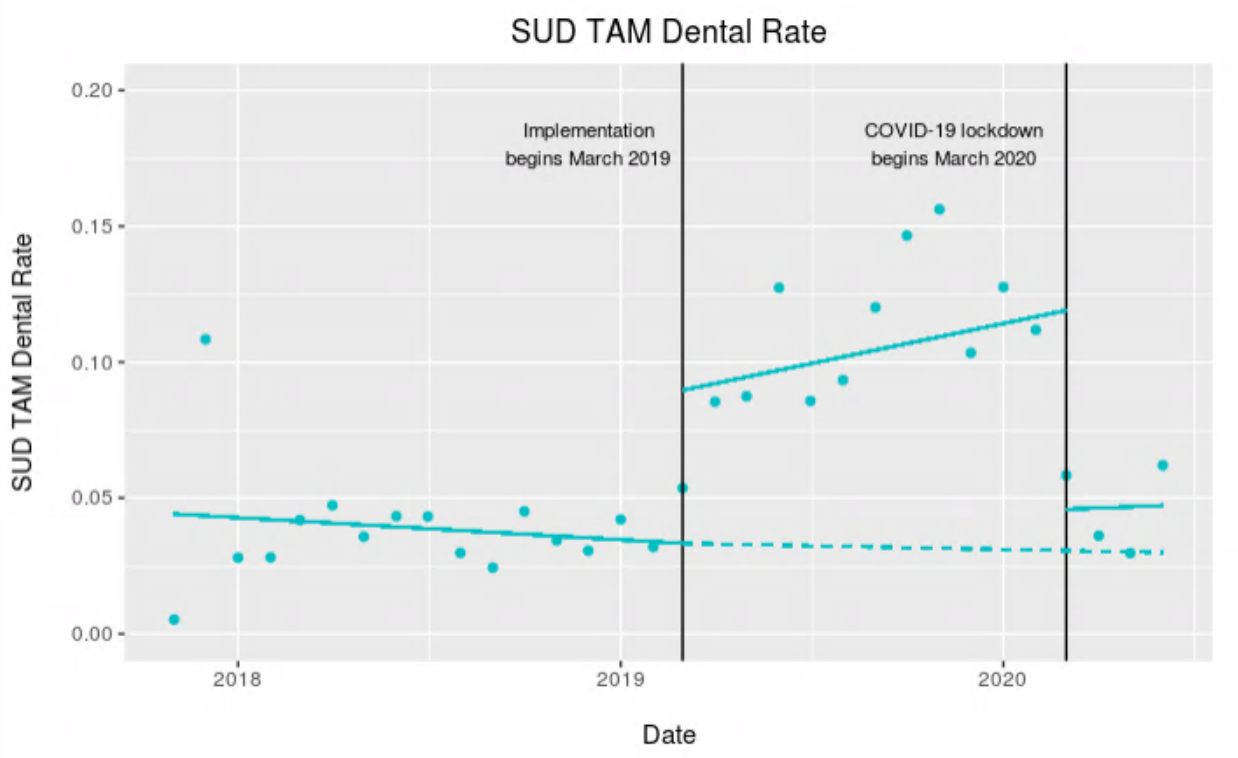
Additional Research Question: Will individuals receiving comprehensive dental treatment have a higher rate of SUD treatment completion?

Table 81: Distribution of Number of Dental Procedures and Total TAM SUD Beneficiaries.

Year	Number of Dental Procedures	Total SUD TAM Beneficiaries	Percentage
2017	32	332	9.64%
2018	434	2,831	15.33%
2019	1,893	4,441	42.63%
2020	824	3,688	22.34%

As shown above in Table 80, the number of dental procedures and the total number of SUD TAM beneficiaries increased each year with a decrease in 2020. However, this decrease could be due to the data only including the first six months of 2020. As shown below in Figure 16, the SUD TAM dental rate increased after implementation and decreased after March 2020, which could be due to the COVID-19 lockdown. The dotted line represents the expected trend if there were no implementation, and the solid lines represent the observed trends.

Fig 17: SUD TAM Dental Rate by Month.



Other Findings

UDOH Implementation Plan Monitoring

UDOH has been proactive in its efforts to collaborate with the Utah Division of Substance Abuse and Mental Health (DSAMH) and SUD service providers throughout waiver planning and implementation. For example, to strengthen and ensure state-wide capacity to

implement evidence-based SUD treatment and trainings on ASAM assessment, treatment planning, and motivational interviewing have been provided several times by DSAMH. To support the waiver changes, the state established a policy requiring prior

authorization for clinically managed low-intensity residential services and included guidance for members enrolled in Pre-paid Mental Health Plan and traditional Fee-for-Service members. Further, contracts with the Pre-paid Mental Health Plans have been clarified to include the use of ASAM for placement criteria and the utilization review process. These and other implementation efforts by UDOH and collaborators at DSAMH and other SUD service providing entities began in the initial stages of demonstration roll out and have continued throughout these initial couple of years. But even with these early efforts, SUD service providers continue to report additional demand for treatment slots which creates delays for those seeking treatment.

COVID – 19 Adaptations

COVID-19 has impacted many aspects of the healthcare system, including SUD treatment services and programming. Two of the most important actions have been to quarantine beneficiaries before entering residential SUD treatment and to successfully transition outpatient individual and group therapeutic treatments from in-person to telehealth practice.

SUD Beneficiary Experience with Services

As previously described in the results section (SUD beneficiary experience with care) a beneficiary survey was conducted in the spring of 2020. Survey findings related to beneficiary understanding of the mental health and SUD service coverage provided, including service access availability, timeliness of services, and overall perceived quality of the services provided was encouraging. While beneficiary experience with care is not part of the SUD mid-point assessment of critical metrics per se, these findings do offer further evidence supporting the overall trend in positive SUD demonstration outcomes in Utah.

Conclusions

For many of the 1115 waiver hypotheses the results to date are largely preliminary, reflective of initial stages in the demonstration projects and early analysis of available data. One must take pause in making any definitive conclusions from the descriptive statistics provided here due primarily to the absence of adjustment for critical demographic and health factors in the changing enrollment populations. Tests of significance indicated by p-values, given large samples, are not meaningful at this juncture, from the standpoint of clinical significance. All conclusions are therefore tentative and await that fuller assessment in forthcoming reports in subsequent years.

These preliminary results do not yet demonstrate improved access and utilization of appropriate healthcare and associated health outcomes. Further, the reduction in costs is not yet reflected in the summary statistics associated with the demonstration populations, despite incentivizing preventive and primary care in lieu of more expensive care such as that provided in the emergency room.

Some tentative results that appear to align with affirming certain hypotheses, however, merit attention. CE enrollees, for example, had an increase in hypertension prescriptions per member diagnosed with hypertension between 2018 and 2019. Increased access to preventive care, in other words, may have contributed to this increase of quality management.

Also, there was reduced non-emergent use of the ED over the period assessed for CE enrollees that drove the reduction in overall ED among that population.

It is unclear what drove such apparent improvements. Given the longer tenure of the CE program, this may suggest that it will take some time for reduction in non-emergent use to arise among more recent programs. It would reinforce that enhanced access to care may result early on in increased ED utilization, both emergent and non-emergent, but over time, as preventive and continuous ambulatory care is improved and incentivized, such enrollees may exhibit reductions in ED use. Of course, more definitive assessments of outcomes await further experience with the program and more data.

Substantial and increased enrollment in several of the demonstrations between 2018 and 2019 also suggest that the programs are meeting significant need. This is evident among the TA demonstration, where enrollment nearly doubled during that period. Smoking cessation program utilization increased concomitantly, as did antidepressant prescriptions and primary care visitations. These results all align with the intent of the demonstration, and better assessment of such access and utilization on health outcomes and cost await longer term data analysis.

Among the BDD program, there also appears to be a substantial increase in utilization of preventive dental services that swamped a far more modest increase in ED dental services. Again, ED dental utilization may subside with longer exposure to such enhanced access.

The Utah Premium Partnership (UPP) is one program where enrollment has languished as a small number. Access to employer-provided health insurance for this low-income population is likely not substantial, and it is also possible that the incentives in the program for employers to offer such insurance is not significant enough to achieve broader success.

The results for 2020, as noted in several instances, were likely reflective of the impact of the COVID-19 pandemic and ought not to be considered at this juncture as indicative of trends. More detailed study of the effects of the pandemic of care among those enrolled in the demonstrations merit more attention.

Overall, most of the outcome measures are trending in the hypothesized direction, however as of 2018, none of the difference-in-difference models were significant which means there was no detectable impact of the demonstration on the outcomes.

For the SUD hypotheses, there were both positive and limited outcomes to date. Hypothesis 1, both Initiation and engagement of treatment had an increase in percentage over time as

hypothesized, but there was no significant change. It is possible that the IMD expansion is not yet having an impact on this outcome or other external factors could have an influence. The same may be true for all the metrics.

For Hypothesis 2, Continuity of Pharmacotherapy had an increase in percentage over time in both groups, but the difference was not significant. Continuity of pharmacotherapy for OUD has a decrease in both groups with a greater decrease in the comparison group. The difference in difference was not significant. For Any SUD treatment, there was a slight decrease in the target and a slight increase in the comparison but there were no significant changes.

For Hypothesis 3, Follow-up after ED had a decrease for 7 days and a decrease for 30 days with no significance. The rate for Inpatient stays for SUD had a small decrease that was not significant. The total number of inpatient stays decreased from 2016 to 2018 which is the desired direction, but the total eligible population also decreased so the rates stayed similar in 2018 and were not significant. This could mean that the decrease was due more to the decrease in the number of eligible individuals and that the IMDs had not yet been able to make an impact on the outcome in 2018.

For Hypothesis 4, preventative health care/ambulatory visits had an increase that was not significant. This may suggest, again, that the intervention is not yet having a detectable difference in the outcome because the demonstration policy has not been in place long enough. Bringing about population-based changes such as increasing preventive health services takes time. It is also critically important to both improving the health of individuals and reducing the overall costs of health care.

For Hypothesis 5, decreasing the rate of overdose deaths due to opioids has not been observed in both the number of deaths and rate thus far since demonstration implementation. This is likely due to the complex and multifaceted nature of opioid overdoses. These include factors such as: lack of awareness or understanding of the health risks of opioid usage on the respiratory system, overprescribing of opioids for pain relief, potential opioid drug interactions with other prescribed medications, and or alcohol or other illicit drugs. To bring about the desired reduction in opioid deaths, a well-designed implementation strategy that is tailored to address each of these factors will be required.

TAM

The rate of dental services for TAM (SUD) increased after implementation and decreased after March 2020. However, changes in dental rates could be due to other factors besides the TAM dental expansion. The COVID-19 lockdown could also account for the decrease in dental services after March 2020.

Clinically Managed Residential Withdrawal

For Hypothesis 1, emergency department utilization for SUD had an increase in rate over time in both groups which suggests there are external factors over time that have led to an increase such as Medicaid expansion or other policy changes. There was no significant difference between the target and comparison groups after the implementation of clinically managed withdrawal services which indicates that clinically managed withdrawal services have not yet led to the hypothesized decrease in emergency department utilization rates for the target group.

For Hypothesis 2, mean emergency department expenditures had an increase in cost over time in both groups with a greater increase in the comparison group. However, there was no significant difference between the target and comparison groups after the implementation of clinically managed withdrawal services which indicates that these services have not yet led to the hypothesized decrease in emergency department expenditures for the target group.

For Hypothesis 3, the number of inpatient services for SUD had an increase in percentage over time in both groups. The target group had a greater increase than the comparison group. SUD inpatient length of stay had a decrease in the target group and an increase in the comparison group. However, there was no significant difference between the target and comparison groups after the implementation of clinically managed withdrawal services which indicates that these services have not yet led to the hypothesized decrease in the number of inpatient services or the length of stay in inpatient services for the target group. For the first three hypotheses, it is possible that the reach of the program is not yet sufficient to create a detectable direct impact on the outcome, or there may be other external factors that we could not account for that may influence the outcome.

For Hypothesis 4, the number of outpatient services for SUD had an increase in percentage over time in both groups with a greater increase in the target group. This change was significant with an 4.81% increase in the difference of the differences for outpatient services in the target group compared to the comparison group. This indicates that the implementation of clinically managed withdrawal services may influence an increased utilization of outpatient services.

For Hypothesis 5, the number of withdrawal management for SUD had an increase in percentage over time in both groups with a greater increase in the target group. This change was significant with a 2.42% increase in the difference of the differences for withdrawal services in the target group compared to the comparison group. Since clinically managed withdrawal services are a component of this metric, it is intuitive that there was a significant increase in withdrawal management utilization in the target group compared to the comparison group.

For research questions related to Hypothesis 1 and 2, beneficiary experience with MH / SUD services appears to be quite positive. Most beneficiaries responding to the survey recognize there are specific services available in their community to address this specialized health care service, if needed. Of those members indicating they or a household member needed these services (in

the previous 12 months) 61% agreed they were able to obtain care “as soon as needed”. When asked to provide a rating of counseling or treatment received in the last 12 months the average rating was 6.43/10. Additionally, and perhaps the most important beneficiary finding was that respondents rated the care they received, with 62% found the counseling or treatment helped (somewhat or a lot).

Finally, supplemental monitoring metrics for this interim evaluation were largely trending positively in the direction desired, indicating UDOH is likely on-track to achieve nearly all their identified goals. Specifically, of the individual monitoring metrics, 14 were rated as “low risk” of not being achieved by the end of waiver demonstration period. Only 2 were rated “medium risk” of not being achieved, and 4 metrics were rated “high risk” of not being achieved.

In summary, although none of the waiver hypotheses demonstrated statistically significant change in the expected direction at mid-point in the demonstration, this does not mean significant progress with implementation of additional SUD services has not been achieved yet. On the contrary, there has been rapid expansion of new SUD services to many beneficiaries with significant needs. There has also been extensive programming instituted to strengthen and build a solid foundation statewide for the SUD treatment agencies and individual providers.

Interpretations, Policy Implications, and Interactions with Other State Initiatives

It is too early yet to make conclusive judgments regarding policy implications to date of the demonstrations analyzed, given the tentativeness of the results noted above in section F above. Progress in achieving enhanced and more efficient access to care, and the resultant improved health outcomes and potential reductions in cost for these low-income populations likely encounter additional barriers associated, for example, with longstanding habits, the lack of conveyance of easily digested and culturally appropriate information, stigma in the provider and broader community, and stringent demands in an often-disruptive life.

On the other hand, there is distinct evidence that when resources are made available, that the eligible population makes use of services. And, as indicated in Section F above, there is also some indication that in programs that have a longer tenure, such as CE, distinct improvements in care and outcome may be manifest, partly because of new incentives incorporated in the program.

Although there were no significant differences in the first year after the demonstration, change can be slow with systematic implementation of interventions. More time with the SUD treatment interventions will be needed to determine if the implementation of IMDs in the state are effective at improving the hypothesized outcomes. It can take a while for implementation to reach the level of fidelity where we would expect results. Treatment change can be slow when working with the high-risk SUD population. Bed space in IMDs is continuing to increase which will

improve access and may make year to year changes more detectable in the data if they are indeed effective. There is a small nominal improvement in most of the metrics from 2016 to 2018, with some indication that the rates are continuing to improve into 2019. It may be promising that the rates are moving in the hypothesized direction, even if the difference is not yet significant.

Beneficiary survey findings generally indicate a positive patient experience accessing services, doing so in a timely manner, and giving notable ratings to both the quality and helpfulness of the services received. Despite this and the changes in policy supporting expanded SUD benefits, demand for services continues to exceed treatment slots and bed availability in the State. While the collaboration between UDOH and DSAMH to strengthen the capacity of SUD treatment agencies and the professionals they employ has been key to the rapid roll out, ongoing long-term engagement between these entities and other SUD treatment agencies must continue to realize the goals of the demonstration more fully.

Lessons Learned and Recommendations

At this early stage of evaluation, the lessons learned are tentative, and therefore there are no attendant recommendations other than sustaining the 1115 Waiver demonstrations are likely worthwhile until greater experience with the programs are attained and more analysis with subsequent years of data are subject to evaluation. Given the stark impact of the COVID-19 pandemic on the health care system and upon its utilization, results from 2020 ought not to be considered indicative of trends.

In Utah, the Department of Health, Office of Health Care Statistics issued a report Preliminary COVID-19 Healthcare Trends: A Snapshot from Utah's All Payer Claims Database & Healthcare Facility Database (Updated December 2020). This report sought to highlight emerging healthcare consumption trends, utilizing insurance providers and hospitals with complete data for the entire period of analysis. They examined a wide variety of issues from telehealth to emergency department acute myocardial infarction, alcohol related disorders, and strokes. The utilization of nearly every condition saw significant decreases in March and April 2020. While these findings were not based on the experience of Medicaid beneficiaries, one specific finding related to preventive care visits and telehealth utilization demonstrated significant adoption of telehealth during the first and second quarter of 2020. This finding suggests there are further opportunities of utilizing telehealth. Similarly, behavioral health including SUD treatment quickly pivoted to utilize this technology.

Within the realm of SUD demonstration several lessons have been learned to date. First, the Utah implementation of additional SUD services could have prevented design changes by beginning collaboration with evaluators earlier in the demonstration planning process. The original evaluation design (DiD) will have to be changed to a single group longitudinal study design, because expansion of IMD facilities in the geographical location planned as a comparison site had a confounding effect on the design and analysis. The revised design will support examining

change with appropriate controls in subsequent years of the demonstration. Systematic change can often take time to see results particularly considering that IMDs were not all implemented at once and the number of beds has continued to increase throughout the duration of the demonstration. As such, one year of data may not have been enough time to detect significant changes in the analyses.

Second, based on the rapid expansion and enrollment of beneficiaries in SUD services as well as the impressive monitoring outcomes achieved to date for many of the supplemental metrics, there appears to be a need to adjust some of the demonstration goals. For example, Milestone 1. "Access to critical levels of care for OUD and other SUDs" have some metrics (e.g., #7 – early intervention, #8 – outpatient services, and #10 residential and inpatient services) with overall demonstration target goals established with a "5% increase". This goal, given the progress to date appears to be too low as all three metrics have in three years doubled and in one case tripled the original goal. Similar outcomes were also achieved in several other milestones and metrics. On the other end of the spectrum, there may also be the need to adjust and or change other target goals as achieving them may be unrealistic. An example of this would be with metric #18 whose definition changed after the first year, but the overall target waiver goal was not adjusted. A specific detailed discussion of this was included in the Supplemental Metrics section of this report.

Third, the central tenet of SUD treatment focuses on the goal of individual client behavior change. Accomplishing this goal at the individual level is a significant challenge for the most effective therapists. This is due to multiple factors including: the addictive nature of SUD, the involuntary participation of many in SUD treatment due to justice-system involvement, and other barriers that negatively impact effective treatment such as lack of jobs and inadequate housing supports for those seeking treatment.

Given these learnings, one recommendation regarding implementation of waiver policies and programs would be to have a well-developed implementation logic model for the provision of evidence-based SUD services. The logic model would serve as the key driver of all implementation efforts that focus on the policy goal and program service delivery. The logic model would also serve as a reference document to guide program implementation and monitoring efforts. Specifically, the logic model would enumerate actionable items that would ensure implementation of evidence-based practices (e.g., implementation of ASAM patient placement criteria) to fidelity. The logic model would also guide service providers to utilize fidelity checklists and other efforts to ensure other evidence-based therapeutic practices were being used by clinical staff.

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Attachment A

A.1: Initiation in Alcohol and Other Drug Dependence Treatment Logistic Regression Results.

Coefficient	**Estimate**	**Std. Error**	**z-value**	**Pr(>|z|)**
(Intercept)	-1.0597	0.1243	-8.5234	<0.0001
Group ● 1 = target ● 0 = comparison	-0.0149	0.0700	-0.2129	0.8314
Post ● 1 = 2018 ● 0 = 2016	0.0810	0.0835	0.9698	0.3322
DiD (interaction of Group and Post)	**0.0016**	**0.0994**	**0.0162**	**0.9870**
Gender ● 1 = male ● 0 = female	0.0987	0.0474	2.0817	0.0374
Race	-0.1527	0.0470	-3.2472	0.0012

• 1 = white • 0 = other or unknown				
Hispanic	0.0750	0.0720	1.0414	0.2977
Alcohol SUD	0.2408	0.0502	4.7971	<0.0001
Opioid SUD	0.2882	0.0488	5.9093	<0.0001
Other SUD	0.2745	0.0498	5.5090	<0.0001
Mental Health Diagnosis	-0.0107	0.0727	-0.1467	0.8834
Age	0.0049	0.0016	2.9905	0.0028

A.2: Engagement in Alcohol and Other Drug Dependence Treatment Logistic Regression Results.

Coefficient	**Estimate**	**Std. Error**	**z-value**	**Pr(>|z|)**
(Intercept)	-0.8286	0.1983	-4.178	<0.001
Group • 1 = target	-0.3226	0.1218	-2.649	0.0081

• 0 = comparison				
Post • 1 = 2018 • 0 = 2016	0.2047	0.1370	1.494	0.1352
DiD	**0.1869**	**0.1680**	**1.112**	**0.2660**
Gender • 1 = male • 0 = female	0.0403	0.0825	0.488	0.6252
Race • 1 = white • 0 = other or unknown	-0.0175	0.0821	-0.213	0.8309
Hispanic	0.2059	0.1159	1.776	0.0758
Alcohol SUD	0.0928	0.0863	1.075	0.2821
Opioid SUD	0.3781	0.0836	4.521	<0.001
Other SUD	0.2623	0.0894	2.933	0.0034

Mental Health Diagnosis	-0.5177	0.1116	-4.637	<0.001
Age	-0.0353	0.0031	-11.355	<0.001

A.3: Continuity of Pharmacotherapy for OUD Logistic Regression Results.

Coefficient	**Estimate**	**Std. Error**	**z-value**	**Pr(>|z|)**
(Intercept)	0.4272	0.2806	2.32	0.1280
Group ● 1 = target ● 0 = comparison	-0.0806	0.2054	0.15	0.6948
Post ● 1 = 2018 ● 0 = 2016	-0.6338	0.2208	8.24	0.0041
DiD	**0.3281**	**0.2491**	**1.73**	**0.1879**
Gender ● 1 = male	-0.0111	0.1258	0.01	0.1879

• 0 = female				
Race • 1 = white • 0 = other or unknown	0.3120	0.1178	7.02	0.0081
Hispanic	-0.2855	0.1885	2.29	0.1299
Alcohol SUD	-0.2505	0.2121	2.73	0.0984
Other SUD	-1.0829	0.1239	76.39	<0.0001
Mental Health Diagnosis	-0.6169	0.1247	24.48	<0.0001
Age	0.0164	0.0049	11.19	0.0008

A.4: Any SUD Treatment Service, Facility Claim, or Pharmacy Claim Logistic Regression Results.

Coefficient	**Estimate**	**Std. Error**	**Wald**	**Pr(>|W|)**
(Intercept)	-6.2971	0.05371	-117.25	<0.001
Group • 1 = target	0.1178	0.0453	2.60	0.0093

• 0 = comparison				
Post • 1 = 2018 • 0 = 2016	0.0216	0.0543	0.40	0.6903
Group*Post	**-0.0682**	**0.0650**	**-1.05**	**0.2939**
Gender • 1 = male • 0 = female	0.2058	0.0301	6.67	<0.001
Race • 1 = white • 0 = other or unknown	0.0656	0.0308	2.13	0.0330
Hispanic	-0.1826	0.0435	-4.20	<0.001
Alcohol SUD	6.7523	0.0618	109.28	<0.001
Opioid SUD	6.2182	0.0522	119.20	<0.001
Other SUD	6.4027	0.0501	127.87	<0.001

Mental Health Diagnosis	0.6231	0.0369	16.87	<0.001
Age	0.0051	0.0011	4.83	<0.001

A.5: Emergency Department Follow-up Within 7 Days Logistic Regression Results.

Coefficient	**Estimate**	**Std. Error**	**z-value**	**Pr(>|z|)**
(Intercept)	-3.6150	0.5534	-6.5317	<0.0001
Group ● 1 = target ● 0 = comparison	0.0237	0.3196	0.0741	0.9409
Post ● 1 = 2018 ● 0 = 2016	-0.3896	0.4638	-0.8402	0.4008
DiD	**0.2829**	**0.5229**	**0.5411**	**0.5884**
Gender ● 1 = male ● 0 = female	0.0193	0.2166	0.0891	0.9290

Race ● 1 = white ● 0 = other or unknown	0.5823	0.2231	2.6107	0.0090
Hispanic	0.0936	0.4103	0.2280	0.8196
Opioid SUD	1.0966	0.2467	4.4460	<0.0001
Other SUD	0.0890	0.2412	0.3688	0.7123
Mental Health Diagnosis	0.5527	0.3347	1.6511	0.0987
Age	0.0145	0.0080	0.1898	0.0688

A.6: Emergency Department Follow-up Within 30 Days Logistic Regression Results.

Coefficient	**Estimate**	**Std. Error**	**z-value**	**Pr(>|z|)**
(Intercept)	-3.5137	0.4809	-7.3069	<0.0001
Group ● 1 = target ● 0 = comparison	0.0567	0.2706	0.2097	0.8339

Post • 1 = 2018 • 0 = 2016	-0.1315	0.3633	-0.3619	0.7174
DiD	**0.0513**	**0.4165**	**0.1232**	**0.9019**
Gender • 1 = male • 0 = female	0.0795	0.1811	0.4389	0.6608
Race • 1 = white • 0 = other or unknown	0.2085	0.1804	1.1558	0.2478
Hispanic	0.2383	0.3405	0.6999	0.4840
Opioid SUD	0.8125	0.2184	3.7201	0.0002
Other SUD	0.1263	0.2025	0.6239	0.5327
Mental Health Diagnosis	0.9695	0.2973	3.2609	0.0011
Age	0.0208	0.0067	3.1187	0.0018

A.7: Inpatient Stays for SUD Logistic Regression Results.

Coefficient	**Estimate**	**Std. Error**	**z-value**	**Pr(>|z|)**
(Intercept)	-6.6489	0.0605	-109.8601	<0.001
Group ● 1 = target ● 0 = comparison	-0.2685	0.0476	-5.6394	<0.001
Post ● 1 = 2018 ● 0 = 2016	-0.2057	0.0569	-3.6135	0.0003
DiD	**0.0487**	**0.0692**	**0.7043**	**0.4812**
Gender ● 1 = male ● 0 = female	-0.1345	0.0337	-3.9885	0.0001
Race ● 1 = white ● 0 = other or unknown	-0.1927	0.0331	-5.8279	<0.001

Hispanic	-0.1457	0.0515	-2.8298	0.0047
Alcohol SUD	3.5034	0.0420	83.3438	<0.001
Opioid SUD	2.8997	0.0380	76.2940	<0.001
Other SUD	3.2030	0.0360	88.8981	<0.001
Mental Health Diagnosis	0.9542	0.0377	25.2811	<0.001
Age	0.0293	0.0008	36.2006	<0.001

A.8: Access to Preventive/Ambulatory Health Services Logistic Regression Results.

Coefficient	**Estimate**	**Std. Error**	**Wald**	**Pr(>|z|)**
(Intercept)	-0.7128	0.1282	30.897	<0.001
Group ● 1 = target ● 0 = comparison	-0.0812	0.0744	1.190	0.2753
Post ● 1 = 2018	0.1948	0.0904	4.640	0.0312

• 0 = 2016				
Group*Post	**-0.0570**	**0.1066**	**0.286**	**0.5925**
Gender • 1 = male • 0 = female	-0.3036	0.0535	32.171	<0.001
Race • 1 = white • 0 = other or unknown	0.3111	0.0513	36.824	<0.001
Hispanic	0.1018	0.0852	1.426	0.2324
Alcohol SUD	-0.1375	0.0673	4.172	0.0411
Opioid SUD	0.4573	0.0654	48.941	<0.001
Other SUD	-0.3126	0.0607	26.561	<0.001
Mental Health Diagnosis	1.8117	0.0513	1245.627	<0.001
Age	0.0315	0.0021	223.789	<0.001

A.9: SUD Emergency Department Visit Logistic Regression Results.

Coefficient	**Estimate**	**Std. Error**	**z-value**	**Pr (>|z|)**
(Intercept)	-3.3219	0.0125	-265.1204	<0.0001
Group • 1 = target • 0 = comparison	0.3983	0.0116	34.4264	<0.001
Post • 1 = After implementation • 0 = Before implementation	0.0245	0.0101	2.4319	0.0150
Time (months starting Nov 2015)	0.0050	0.0003	16.8460	<0.001
Group*Time (Interaction of Group and Time)	-0.0029	0.0004	-6.7586	<0.001
DiD (interaction of Group and Post)	**0.0256**	**0.0143**	**1.7936**	**0.0729**
Hispanic	-0.1954	0.0076	-25.8015	<0.001

• 1 = yes • 0 = no				
Age	0.0074	0.0002	46.6643	<0.001
Demonstration population: Blind/Disabled - Dental Eligible	-0.6484	0.0076	-85.1366	<0.001
Demonstration population: Current eligible CHIP Children	-12.5365	9.5791	-1.3087	0.1906
Demonstration population: Current Eligibles - PCR	-0.5219	0.0079	-66.3487	<0.001
Demonstration population: Demonstration population #3	-7.2908	1.000	-7.2904	<0.001
Demonstration population: Non-1115 waiver	-3.2939	0.0102	-321.7179	<0.001

Demonstration population: Targeted adults	1.7091	0.0086	198.4212	<0.001

A.10: SUD Inpatient Service Logistic Regression Results.

Coefficient	**Estimate**	**Std. Error**	**z-value**	**Pr(>|z|)**
(Intercept)	-3.4558	0.0129	-267.6510	<0.001
Group ● 1 = target ● 0 = comparison	0.3895	0.0120	32.5198	<0.001
Post ● 1 = After implementation ● 0 = Before implementation	0.0297	0.0104	2.9649	0.0042
Time (months starting Nov 2015)	0.0055	0.0003	17.8598	<0.001
Group*Time (Interaction of Group and Time)	-0.0027	0.0004	-6.1814	<0.001

DiD (interaction of Group and Post)	**0.0196**	**0.0147**	**1.3359**	**0.1816**
Hispanic ● 1 = yes ● 0 = no	-0.2226	0.0079	-28.2653	<0.001
Age	0.0087	0.0002	53.0586	<0.001
Demonstration population: Blind/Disabled - Dental Eligible	-0.6600	0.0078	-84.33=223	<0.001
Demonstration population: Current eligible CHIP Children	-13.4243	15.7920	-.08501	0.3953
Demonstration population: Current Eligibles - PCR	-0.4868	0.0081	-60.4257	<0.001
Demonstration population: Demonstration population #3	-13.6603	15.2376	-0.8I<965	0.3700

Demonstration population: Non-1115 waiver	-3.2788	0.0106	-309.9731	<0.001
Demonstration population: Targeted adults	1.6995	0.0088	193.1223	<0.001

A.11: SUD Outpatient Services.

Coefficient	**Estimate**	**Std. Error**	**z-value**	**Pr(>|z|)**
(Intercept)	-0.2016	0.0230	-8.7595	<0.001
Group ● 1 = target ● 0 = comparison	-0.3708	0.0206	-18.0181	<0.001
Post ● 1 = After implementation ● 0 = Before implementation	-0.1234	0.0172	-7.1796	<0.001
Time (months starting Nov 2015)	0.0056	0.0005	11.0640	<0.001

Group*Time (Interaction of Group and Time)	-0.0059	0.0007	-7.8887	<0.001
DiD (interaction of Group and Post)	**0.3576**	**0.0248**	**14.4337**	**<0.001**
Gender • 1 = male • 0 = female	-0.2039	0.0079	-25.6940	<0.001
Age	0.0023	0.0003	6.7124	<0.001
Demonstration population: Blind/Disabled - Dental Eligible	-0.1539	0.0138	-11.1793	<0.001
Demonstration population: Current Eligibles - PCR	0.0927	0.0142	6.5161	<0.001
Demonstration population: Non-1115 waiver	-0.0421	0.0161	-2.6185	0.0088
Demonstration population: Targeted adults	0.2057	0.0141	14.5471	<0.001

A.12. SUD Withdrawal Management Services Logistic Regression Results.

Coefficient	**Estimate**	**Std. Error**	**z-value**	**Pr(>|z|)**
(Intercept)	-4.1691	0.1008	-41.3585	<0.001
Group ● 1 = target ● 0 = comparison	0.1802	0.0963	1.8719	0.0612
Post ● 1 = After implementation ● 0 = Before implementation	0.2374	0.0877	2.7065	0.0068
Time (months starting Nov 2015)	-0.0099	0.0027	-3.7222	0.0002
Group*Time (Interaction of Group and Time)	0.0011	0.0035	0.3190	0.7497
DiD (interaction of Group and Post)	**1.0375**	**0.1118**	**9.2834**	**<0.001**

Gender • 1 = male • 0 = female	0.2252	0.0313	7.1952	<0.001
Age	0.0031	0.0014	2.2081	0.0272
Demonstration population: Blind/Disabled - Dental Eligible	-0.6072	0.0589	-12.4248	<0.001
Demonstration population: Current Eligibles - PCR	-0.3714	0.0515	-7.2079	<0.001
Demonstration population: Non-1115 waiver	-1.1692	0.0777	-15.0455	<0.001
Demonstration population: Targeted adults	-0.0800	0.0425	-1.8800	0.0601

Attachment B

2020 Utah Medicaid Beneficiary Survey

Q1.a Age How old are you (in years)?

Q1.b Reside In which state do you currently reside?

Q1.c.Enrolled Are you currently enrolled in Medicaid?

Q2 How long have you received health care through your medical plan?

Q3BRFSS Prior to being enrolled in your current medical plan, did you have other health care coverage, including health insurance, prepaid plans such as HMO's or government plans such as Medicare, or Indian Health Service?

Q4 How long were you enrolled in that coverage?

Q5BRFSS Was there a time before you were enrolled in your current medical plan when you needed to see a doctor but could not because of cost?

Q6CAHPS Prior to being enrolled in your medical plan, how would you rate your overall physical health?

Q7CAHPS Prior to being enrolled in your medical plan, how would you rate your overall mental or emotional health?

Q8CAHPS Your Health Care in the Last 6 Months: These questions ask about your own health care. Do not include care you got when you stayed overnight in a hospital. Do not include the times you went for dental care visits.

Q9 In the last 6 months, did you have an illness, injury, or condition that needed care right away in a clinic, emergency room or doctor's office?

Q10ED When you needed care right away, did you go to an emergency room?

Q11ED When you received medical treatment in the emergency room, were you required to pay a surcharge?

Q12CAHPS In the last 6 months, did you make any appointments for a check-up or routine care at a doctor's office or clinic?

Q13CAHPS In the last 6 months, not counting the times you went to an emergency room, how many times did you go to a doctor's office or clinic to get health care for yourself?

Q14CAHPS In the last 6 months, how often did you get an appointment for a check-up or routine care at a doctor's office or clinic as soon as you needed?

Q15CAHPS What number would you use to rate all your health care?

Q16BRFSS In thinking about your physical health, which includes physical illness and injury, for how many days during the past 30 days was your physical health not good?

Q17BRFSS In thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?

Q18BRFSS During the past 30 days, for about how many days did poor physical or mental health keep you from doing your usual activities, such as self-care, work, or recreation?

Q19CAHPS Your Personal Doctor: This is someone you would see if you need a check-up, want advice about a Do you have a personal doctor?

Q20CAHPS In the last 6 months, how many times did you visit your personal doctor to get care for yourself?

Q21CAHPS In the last 6 months, how often did your personal doctor explain things in a way that was easy to understand?

Q22CAHPS In the last 6 months, how often did your personal doctor listen carefully to you?
health problem or get sick or hurt.Q23CAPHS In the last 6 months, how often did your personal doctor show respect for what you had to say?

Q24CAHPS In the last 6 months, how often did your personal doctor spend enough time with you?

Q25CAHPS What number would you use to rate your personal doctor?

Q26CAHPS Getting Dental Care: The next set of questions ask about your dental care, including any orthodontic procedures.

In the last 6 months did you make any appointments to see a dentist?

Q27CAHPS In the last 6 months, how often was it easy to get the care or treatment you needed?

Q28CAHPS In the last 6 months, how often did you get an appointment to see a dentist as soon as you needed?

Q29CAHPS What number would you use to rate the dentist or orthodontist you saw most often in the last 6 months?

Q30ECHO Your Health Plan: The next questions ask about your experience with other benefits available as part of your health care plan. For example, people can get counseling, treatment, or medicine for many different reasons, such as:

- For feeling depressed, anxious, or "stressed out"
- Personal problems (like when a loved one dies or when there are problems at work)
- Family problems (like marriage problems or when parents and children have trouble getting along)
- Needing help with drug or alcohol use
- For mental or emotional illness

Are these health care services covered as part of your health care plan?

Q31ECHO If you felt depressed, needed assistance with drug or alcohol use, or mental or emotional illness are there places in your community you could go to get the help needed?

Q32ECHO In the last 12 months, have you or a member of your household needed counseling, treatment, or medicine for depression, drug, or alcohol use, or mental or emotional illness?

Q33ECHO In the last 12 months, when you or a member of your household needed counseling, treatment, or medicine , how often were you or a family member able to see someone as soon as needed?

Q34ECHO Using any number from 0 to 10, where 0 is the worst counseling or treatment possible and 10 is the best counseling or treatment possible, what number would you use to rate all the counseling or treatment in the last 12 months?

Q35ECHO In the last 12 months, how much were you or a member of your household helped by the counseling, treatment, or medicine?

Q36CAHPS The last few questions ask about you?

In general, how would you rate your overall physical health?

Q37CAHPS In general, how would you rate your overall mental or emotional health?

Q38CAHPS Are you male or female?

Q39 What language do you mainly speak at home?

Q40CAHPS What is the highest grade or level of school you have completed?

Q41CAHPS Are you of Hispanic or Latino origin or descent?

Q42CAHPS What is your race?

Q43 Which county do you live in?

Attachment C

https://medicaid.utah.gov/Documents/pdfs/Utah%20PCN%20SUD%20evaluation%20Design%20Approval.pdf

Attachment D

Demonstration Populations, Outcomes and Measures (including procedure codes).

Demonstration Population & Hypothesis	**CE 1.** Outcome	Measure
CE-Hypothesis 1	**CE 2.**	Total copay amount=medical copay + pharmacy copay

	Average annual cost share	PMPM=Total copayment/Total enrollment months (Medicaid Claims)
	CE 3. Adults with hypertension diagnosis	Essential hypertension (ICD-10 code: I10) from NCQA
	CE 4. Pharmacy prescriptions per member per month	National drug code (NDC) in the pharmacy claims data was used to identify pharmacy prescriptions. (Medicaid Claims)
	CE 5. Hypertensive prescriptions	NDC and drug names from HEDIS https://www.ncqa.org/hedis/measures/hedis-2019-ndc-license/hedis-2019-final-ndc-lists/
PCN-Hypothesis 2a	**PCN 1.** Rate of uninsured adults in poverty in Utah	Adults in Utah under 100% of the poverty line not otherwise covered retrieved from the Utah Behavioral Risk Factor Surveillance System (BRFSS)

PCN-Hypothesis 2b	**PCN 2.** Hypertension diagnosis	Essential hypertension (ICD-10 code: I10) from NCQA
PCN-Hypothesis 3	**PCN 3.** Emergency department (ED) visit	Revenue code: 450, 451, 452, 456, 459, 981 Procedure code: 99281~99292 Place of service: 23
	PCN 4. Non-emergent ED visit	Defined from UDOH
UPP-Hypothesis 4	**UPP 1-4** Members receiving assistance obtaining employer-sponsored health insurance	List of enrollees provided from UDOH.
Targeted adults-Hypothesis 5	**TA 1.** Members receiving assistance	List of enrollees provided from UDOH.

Targeted adults-Hypothesis 6	**TA 2.** Smoking diagnosis	Smoking diagnosis, tobacco screening and cessation -Smoking diagnosis from CMS Chronic Conditions Data Warehouse https://www2.ccwdata.org/web/guest/condition-categories -Tobacco screening and cessation using CPT codes: 99406 and 99407 -Smoking diagnosis during outpatient visits -Outpatient visit codes from HEDIS Procedure code: 93784 93788 93790 99091 99201 99202 99203 99204 99205 99211 99212 99213 99214 99215 99241 99242 99243 99244 99245 99347 99348 99349 99350 99381 99382 99383 99384 99385 99386 99387 99391 99392 99393 99394 99395 99396 99397 99401 99402 99403 99404 99411 99412 99429 99455 99456 99483 99341 99342 99343 99344 99345 G0402 G0438 G0439 G0463 T1015 99304 99305 99306 99307 99308 99309 99310 99315 99316 99318 99324 99325 99326 99327 99328 99334 99335 99336 99337 We also used Place of Services to identify outpatient visits: 2, 3, 5, 7, 9, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 22, 33, 49, 50, 71, 72
	TA 3. Antidepressant	-Major depression diagnosis from CMS Chronic Conditions Data Warehouse

	medication management	https://www2.ccwdata.org/web/guest/condition-categories ICD-10: F3130 F3131 F3132 F3160 F3161 F3162 F3163 F3164 F3175 F3176 F3177 F3178 F3181 F3340 F3341 F3342 F4321 F4323 F314 F315 F3160 F320 F321 F322 F323 F324 F325 F329 F330 F331 F332 F333 F338 F339 F341 -list of antidepressant medications from HEDIS NDC https://catalog.data.gov/dataset/hypertension/resource/6f55a477-90a1-452e-8322-5bb9b5b07574 - Antidepressant medication management from HEDIS https://www.ncqa.org/hedis/measures/antidepressant-medication-management/
	TA 4. Preventive care visit	Procedure code: 99201 99202 99203 99204 99205 99211 99212 99213 99214 99215 99241 99242 99243 99244 99245 99341 99342 99343 99344 99345 99347 99348 99349 99350 99381 99382 99383 99384 99385 99386 99387 99391 99392 99393 99394 99395 99396 99397 99401 99402 99403 99404 99411 99412 99429 92002 92004 92012 92014

		99304 99305 99306 99307 99308 99309 99310 99315 99316 99318 99324 99325 99326 99327 99328 99334 99335 99336 99337 98966 98967 98968 99441 99442 99443 98969 99444 99483 G0402 G0438 G0439 G0463 T1015 S0620 S0621 Diagnosis code: Z0000 Z0001 Z0271 Z0279 Z0281 Z0282 Z0283 Z0289 Z00121 Z00129 Z003x Z005x Z008x Z020x Z021x Z022x Z023x Z024 Z025x Z026x Z029x Z761x Z762x
	Costs: smoking diagnosis, antidepressant medication, management, and preventive care visit	Reimbursed amounts.
TA -Hypothesis 7	**TA 4.** Non-emergent ED visit	ED visit Revenue code: 450, 451, 452, 456, 459, 981 Procedure code: 99281~99292 Place of service: 23 Non-emergent ED visit: Defined by UDOH
	TA 5. Cost of ED visits	Reimbursed amounts associated with ED visits.

	TA 6. Most commonly experienced diagnoses in ED and associated costs	-Primary diagnoses codes only in ED visits -Reimbursed amounts associated with ED visits.
BBD-Hypothesis 9	**BDD 1.** ED dental services	CPT code: D0140
	BDD 2. ED dental care cost	Reimbursed amounts associated with ED dental visits.
	BDD 3. Utah rate of members with a preventive dental care	Retrieved from the Utah BRFSS.
	BDD 4. Preventive dental care cost	-All visits other than coded emergency dental visits. - Reimbursed amounts associated with preventive dental visits.