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

CENTERS FOR MEDICARE & MEDICAID SERVICES
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State Demonstrations Group

January 17, 2025

Judy Mohr Peterson, Ph.D.
Med-QUEST Division Administrator
State of Hawaii, Department of Human Services
601 Kanokila Blvd, Room 518
Kapolei, HI 96709-0190

Dear Dr. Mohr Peterson:

The Centers for Medicare & Medicaid Services (CMS) completed its review of the Hawaii QUEST Integration Interim Evaluation Report, which is required by the Special Terms and Conditions (STCs), specifically STC #61 “Interim Evaluation Report” of Hawaii’s section 1115 demonstration, “QUEST Integration Medicaid Section 1115 Demonstration” (Project No: 11-W00001/9), effective through January 7, 2025. This Interim Evaluation Report covers the period from August 2019 through July 2023. CMS determined that the Evaluation Report, submitted on March 25, 2024 and revised on September 25, 2024, is in alignment with the CMS-approved Evaluation Design and the requirements set forth in the STCs, and therefore, approves the state’s Interim Evaluation Report.

Despite challenges due to the COVID-19 PHE, the state’s Interim Evaluation Report showed evidence of some progress made toward the demonstration’s goals. One focus of the demonstration was to increase primary care use and preventive services. Primary care spending decreased during the demonstration period; however, primary care visits that did occur were associated with positive outcomes, like better diabetes control and follow-up after ED for behavioral health hospitalizations. Findings for the integrated, team-based care coordination for complex conditions were evaluated by one health plan, which indicated that spending on the initiative was offset by positive impacts on ED utilization and expenditures. The HCBS project yielded promising results in that beneficiaries remaining in home settings displayed stable level of care scores over the demonstration period, while members in nursing homes or Community Care Foster Family Homes showed relative deterioration. Other components under the demonstration—Value-based Reimbursement at Health Plan and Provider Levels and Community Integration Services—could not yet be evaluated regarding health outcomes. The state’s Summative Evaluation Report is expected to provide a fuller understanding of the demonstration’s effectiveness leveraging additional years of data that may enable separating out the confounding effects of the COVID-19 PHE from those of the demonstration itself.

In accordance with STC #64, the approved Interim Evaluation Report may now be posted to the state's Medicaid website within 30 days. CMS will also post the Interim Evaluation Report on Medicaid.gov.

We look forward to our continued partnership on the Hawaii's QUEST Integration section 1115 demonstration. If you have any questions, please contact your CMS demonstration team.

Sincerely,

Danielle Daly -S

Digitally signed by Danielle Daly -S
Date: 2025.01.17 11:20:30 -05'00'

Danielle Daly
Director
Division of Demonstration Monitoring and Evaluation

cc:	Brian Zolynas, State Monitoring Lead, CMS Medicaid and CHIP Operations Group

Hawaiʻi QUEST Integration
Section 1115 Waiver Demonstration
Evaluation Report

Funded by Centers for Medicare and Medicaid Services (CMS), Project No. I I-W-00001/9

Center for Research and Evaluation in the Social Sciences
Social Science Research Institute
College of Social Sciences | University of Hawai'i at Mānoa

For questions, please contact:

John P. Barile
Director & Professor
Social Science Research Institute

Social Science Research Institute
2424 Maile Way, Saunders Hall 704
Honolulu, HI 96822
https://ssri.manoa.hawaii.edu/

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Reinie Gerrits-Goh, Yan Luo, Hua Zan, Anna Pruitt, Joy Agner, Yan Yan Wu, Krysia Mossakowski, Mark Willingham, Jr, Charles Iwata, Hannah Pearson, Monet Meyer, Karolina Hajkova, Hailey Farago, Nancy Marker, Sanjeev Sridharan & John Barile (2023). Hawaiʻi QUEST Integration Section 1115 Waiver Demonstration Evaluation Report. Prepared for the State of Hawaiʻi Department of Human Services Med-QUEST Division and the U.S. Centers for Medicare & Medicaid Services.

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Acronyms

Acronym	Meaning
AAP	Adults' Access to Preventive/Ambulatory Health Services
ABD	Aged, Blind, & Disabled
ACO	Accountable Care Organization
AIC	Akaike Information Criterion
AMA	American Medical Association
APM	Alternative Payment Model
BHO	Behavioral Health Organization
BIC	Bayesian Information Criterion
CAHPS	Consumer Assessment of Healthcare Providers and Systems
CAMHD	Child and Adolescent Mental Health Division
CCFFH	Community Care Foster Family Homes
CCS	Community Care Services
CDC	Comprehensive Diabetes Care
CDPS	Chronic Illness and Disability Payment System
CES	Coordinated Entry System
CFR	Code of Federal Regulations
CI	Confidence Interval
CIS	Community Integration Services
CMS	Centers for Medicare and Medicaid Services
CPI	Consumer Price Index
CTS	Community Transition Services
CY	Calendar Year
DCC	Diabetes & Cardiovascular Class
DHS	Hawaiʻi Department of Human Services
DOH	Hawaiʻi Department of Health
E&M	Evaluation and Management
ED	Emergency Department
EHCN	Expanded Health Care Needs
ER	Emergency Room

FFS	Fee-For-Service
FUH	Follow-up After Hospitalization
FQHC	Federally Qualified Health Center
HAO	Health Analytics Office
HAP	Health Action Plan
HC	Healthy Class
HCBS	Home- and Community-Based Services
HCS	Health Coordination Services
HEDIS	Health Effectiveness Data and Information Set
HFA	Health and Functional Assessment
HILOC	Hawaiʻi Level of Care
HIR	Hawaiʻi Immunization Registry
HMIS	Homeless Management Information System
HMSA	Hawaiʻi Medical Service Association
HOPE	Hawaiʻi ʻOhana Nui Project Expansion
HPMMIS	Hawaiʻi Prepaid Medical Management Information System
HSP	Homeless Service Provider
LCA	Latent Class Analysis
LMR-LRT	Lo-Mendell-Rubin Adjusted Likelihood Ratio Test
LTA	Latent Transition Analysis
LTSS	Long-Term Services and Supports
LVC	Low Value Care
MCC	Multimorbidity Class
MCO	Managed Care Organization
MQD	Hawaiʻi Department of Human Services Med-QUEST Division
NFLOC	Nursing Facility Level of Care
NP	Nurse Practitioners
NR	Not Reportable
P4P	Pay for Performance
PA	Physician Assistants
PCG	Public Consulting Group

PCP	Primary Care Provider
PCP-E	Primary Care Provider Enhancement
PCPCC	Patient-Centered Primary Care Collaborative
PHC	Poor Health Class
PIP	Performance/Process Improvement Plan
PLD	Patient Level Detail
PMPM	Per Member Per Month
PQI	Prevention Quality Indicator
PRO	Patient-Reported Health Outcomes
PSC	Psychiatric & Substance Class
QA	Quality Assurance
QI	QUEST Integration
RCA	Rapid Cycle Assessments
RQ	Research Question
SDOH	Social Determinants of Health
SEBD	Support for Emotional and Behavioral Development
SHCN	Special Health Care Needs
SMI	Serious Mental Illness
SNA	Social Network Analysis
SPMI	Severe and Persistent Mental Illness
SSRI	Social Sciences Research Institute
TCC	Total Cost of Care
UH	University of Hawaiʻi
VBP	Value-Based Purchasing
VHC	Value-Driven Health Care
WCV	Well Child Visit

List of Tables and Figures

Executive summary

Hawaiʻi was awarded a 5-year renewal of the 1115 waiver with the Centers for Medicare and Medicaid Services (CMS) with the demonstration project titled "Hawaiʻi QUEST Integration" ("demonstration") (Project No. I l-W-00001/9) in July 2019, effective August 1, 2019, and running through July 31, 2024. MedQUEST Division (MQD) used this demonstration as a vehicle to implement the Hawaiʻi ʻOhana Nui Project Expansion (HOPE) Initiative, an effort to empower Hawaiʻi's residents to improve and sustain well-being by developing, promoting, and administering innovative and high-quality health care programs with aloha.

The University of Hawaiʻi (UH) Social Science Research Institute (SSRI) was selected to carry out an independent evaluation of this waiver period, and this report presents the results from said evaluation. The 1115 waiver demonstration evaluation focused on six priority areas including 1) Primary Care, 2) Care Coordination for Beneficiaries with Complex Conditions, 3) Home- and Community-Based Services, 4) Value-Based Purchasing, 5) Community Integration Services, and 6) Social Determinants of Health. SSRI assessed data ranging from May, 2014 to March 2023, capturing data from several years preceding the demonstration period, as well as the years during the current demonstration period (August 2019–March 2023). Special caution should be used when interpreting the results of this evaluation, recalling that the COVID-19 pandemic occurred in the midst of the demonstration period and has had unforeseen consequences on implementation of new waiver authorities, costs, and outcomes.

Lessons Learned

As part of the HOPE initiative, MQD, health plans and UH SSRI developed ongoing collaborations to transform program development, measurement, and reporting across all priority areas. This collaboration advanced novel reporting mechanisms outside traditional administrative data to capture rich clinical data, member quality of life, and financial and provider information for these evaluations. Over the course of the demonstration, MQD developed and implemented these reports, resulting in improvements to data quality, and providing new insights into patient outcomes and provider data. As the reporting transformation continues, the newly-established infrastructure will aid evaluation and program improvement efforts in future demonstrations. Improved monitoring will allow MQD and future evaluators to track health care outcomes for the different priority areas, and thus will support greatly increased capabilities for evidence-based policy changes in the future.

Working independently with the products of those collaborations, the UH SSRI evaluation team analyzed program effectiveness within the six priority areas through 2022. The full impacts theorized in the waiver are not yet detectable at the time of evaluation due to ongoing implementation efforts and multi-year theory of change timelines. However, observations made by the UH evaluation team suggest some progress, specifically for members receiving health coordination services (HCS) and home- and community-based services (HCBS), in the enhancement of primary care services and functional definitions, and health plan achievement of quality outcomes set in MQD's value-based pay-for-performance program.

Findings

The demonstration addressed a wide range of strategies and interventions to promote healthy outcomes and reduce costs. Accordingly, the evaluation used a variety of research and statistical approaches to assess the impacts and outcomes of the demonstration interventions and strategies.

To better understand the Medicaid population in Hawaiʻi over the initiative period, the evaluation team conducted a longitudinal analysis of chronic disease treatment history among Med-QUEST Division from 2017–

2022. Latent mixture modeling was used to identify subgroups of beneficiaries with similar patterns of chronic condition treatment. Five unique subgroups were identified: 1) the Healthy Class (HC), who had relatively low utilization of healthcare for all conditions, accounting for 69% of the overall sample; 2) the Multimorbidity Class (MMC) who had moderate healthcare utilization for many conditions, including cardiovascular, skeletal, pulmonary, and gastrointestinal, and eye disease—13% of the sample; 3) the Psychiatric & Substance Class (PSC), members with a high probability of being treated for a psychiatric condition (63%) and a substance abuse condition (36%)—10% of the sample; 4) the Diabetes & Cardiovascular Class (DCC), who had a very high probability of being treated for type II diabetes (93%) and cardiovascular disease (73%)—5% of the sample; and 5) the Poor Health Class (PHC), with the highest rates of almost all conditions (with the exceptions of type II diabetes, psychiatric, substance use and eye disease)—accounting for 4% of the sample.

We found that between 2017–2021, the majority of members stated in the same “class” or subgroup but some transitioned to a class of greater or poorer health. Members with low evidence of utilization (the Healthy Class) in 2017 were most likely to continue experiencing low healthcare utilization in 2021, suggesting that they maintained their health in subsequent years. Members who received psychiatric and substance abuse treatments in 2017 were most likely to transition to the Healthy Class in 2021. Notably, members in the 2017 Poor Health Class had a higher likelihood of death by 2021 than those in other classes.

Project 1A: Assessing Utilization, Spending, and Quality of Primary Care and its Association with Health Outcomes

Project 1A aimed to increase primary care utilization and the usage of preventive services. MQD hypothesized that the initiative would increase utilization, spending (as a percentage of total spending), and quality of primary care for beneficiaries as measured according to four newly developed definitions of primary care services: 1) primary care visits; 2) beneficial primary care services 3) primary care supports; and 4) low-value primary care.

Results indicate a strong reduction in primary care spending during the demonstration period, showing a decline in spending as well as a decline in (to a lesser extent) utilization of primary care visits, beneficial primary care services, and primary care supports. The year-over-year changes were not uniform across primary care categories. Average spend per beneficial primary care service and primary care support service reduced over time. However, average spend per primary care visit was relatively stable in comparison. Low-value services decreased strongly from 2020 to 2021. Spend on primary care as a proportion of total spend, remained roughly equal throughout the years, with a slight uptick from 2021 to 2022.

The evaluation team further investigated the relationship between primary care utilization and selected health care outcomes. Across three definitions of primary care (primary care visits, beneficial primary care services, and primary care supports), they found a weak positive relationship between primary care utilization and emergency department or inpatient stays within the same year. On the other hand, the receipt of primary care visits showed stronger positive relationships with several quality outcomes, including better diabetes control and timely follow-up of ED visits and hospitalization for behavioral health issues. Nevertheless, many effects of utilization of beneficial services and supports will only be measurable over a longer period of time. The newly developed definitions for primary care enabled the evaluation team to pinpoint where additional investment in primary care could be beneficial. They can now explore how these investments might impact healthcare outcomes based on the different definitions of primary care. Though evaluation results are mixed, the positive relationships between the receipt of primary care and quality outcomes are encouraging; overall, given that the COVID-19 pandemic may have had a strong impact on the decreasing trends reported, the findings of this evaluation support a continued focus for MQD and its health plans on investments in primary care to improve health outcomes.

Project 1B: Care Coordination for Beneficiaries with Complex Conditions

Project 1B aimed to improve care coordination by establishing team-based care and greater integration of behavioral and physical health as examples. MQD hypothesized that care coordination for individuals with complex health needs would result in improved health outcomes, lowered utilization of the healthcare system, and a slower rate of expenditure growth.

Only one health plan successfully collected the necessary data to analyze the association between HCS and costs, utilization and outcomes. The analysis revealed that only 15% of members enrolled as Special Health Care Needs/Expanded Health Care Needs members (SHCN/EHCN) were considered actively engaged with HCS. Outputs further suggested that SHCN/EHCN populations who were engaged with HCS have higher expenditure and utilization on home health services and primary care supports compared to SHCN/EHCN populations who remained unengaged with HCS.

The key finding was that the increased spending on home health services and primary care supports was offset by positive impacts on key health outcomes: SHCN/EHCN members engaged in HCS experienced lower expenditure on ED services, as well as lower utilization of ED and inpatient services. While engagement in services appeared low, and the results represent only one out of the five contracted health plans, these results suggest positive effects of HCS for those members who are engaged. The evaluation team's findings demonstrate the critical value of HCS for the SHCN/EHCN population, and reinforce the need to identify and remove barriers to engagement in HCS in order for Hawaiʻi to increase the population-level impact of these services on its high-needs, high-cost populations with complex health conditions.

Project 1C: Home- and Community-Based Services (HCBS)

Project 1C's primary goal was to enhance HCBS, hypothesizing that the provision of HCBS, including a subset of HCBS to populations at risk for functional declines, could slow the deterioration of the health and functional statuses for these populations. Variations were expected in entry time to nursing homes, patient-reported health outcomes (PROs), and care costs for both the population meeting Nursing Facility Level of Care (NF LOC) and the at-risk population.

Results show that nursing home and foster home residents exhibited higher average Level of Care (LOC) scores (i.e., higher levels of disability/lower functional status and higher acuity of health conditions) in comparison to those residing at home. Among members with high LOC scores, members in home settings displayed stable LOC scores over the demonstration period, while members in nursing homes or Community Care Foster Family Homes (CCFFH) experienced deteriorations in their functional status scores. These findings reiterate the health benefits of home-based care relative to foster home or nursing home based care for individuals who meet criteria for Long Term Services and Supports (LTSS), and reinforced the non-financial strengths of some HCBS settings over nursing home care. Results also identified gaps in outcomes within populations receiving HCBS that require further exploration and intervention.

When comparing individuals meeting NF LOC and the At-Risk population, the evaluation team found differences in the length of time to enter a nursing home, goal attainment, and cost of care. At-Risk individuals spent the longest period of time in community settings before entering nursing homes, had higher goal attainment, and lower cost of care that continued to decline over the demonstration period. At-Risk individuals received HCBS in home-based settings, further underscoring the protective impacts of home-based care on mitigating functional status declines. Members aged between 65 and 75 years, female members, and those with social support tended to spend a longer time in the community setting before they entered a nursing home when compared to those 85 years and older, males, or those without family and friends to continue care at home.

These results underscore the protective impact of HCBS in home-based care settings and emphasize the salutary influence of familiar environments and family support on health outcomes for the LTSS population. The evaluation demonstrated efficacy for the HCBS program, particularly when provided in home settings to improve the health of members meeting NF LOC, and revealed the need for further exploration into the causes of functional status decline among members in community foster home settings. Additionally, it was found that members with lower functional status, and those with dementia or mental illness, were less likely to receive care at home than other LTSS members. This reveals the need for continued rebalancing efforts and investment in HCBS provision to support in-home care when possible. Additionally, the evaluation established a baseline for Hawaiʻi's At-Risk population.

Projects 2A & 2B: Value-Based Purchasing (VBP) Reimbursed at the Health Plan and Provider Levels

Projects 2A and 2B evaluated the implementation of alternative payment models (APM) at the provider level and VBP reimbursement methodologies at the health plan level. MQD hypothesized that these investments would increase appropriate utilization of the healthcare system and thereby reduce preventable healthcare costs. MQD implemented three main approaches to incentivize health plans to focus on improving quality and/or maintaining costs: 1) health plan capitation; 2) Pay-for-Performance (P4P) Programs; and 3) the member auto-assign program with a quality component. MQD implemented multiple methods to incentivize improved outcomes. Data suggests that health plans were increasingly reaching P4P benchmarks set by MQD. Whereas in 2016 health plans had an average achievement level of 46.3%, P4P performance increased to 63.5% in 2021. Health plans have now established several programs aimed at improving health outcomes in alignment with MQD intentions. Additionally, most health plan initiatives focus on primary care.

Most health plans focused on VBP arrangements based on a fee-for-service (FFS) payment structure, with only two initiatives incorporating risk-based payments. Seven arrangements included population-based payments, specifically including per-member, per-month (PMPM) payments. However, these population-based arrangements were generally aimed at additional payments for at-risk populations on top of the prevailing reimbursement model and do not fully integrate population payments for the total patient population.

Despite these successes, much work remains to learn from existing VBP programs, identify their strengths and weaknesses and leverage successful components to build stronger VBP programs in Hawaiʻi. Currently, the effectiveness of the implemented programs on targeted health outcomes has been mostly unstudied. A learning community-based approach where health plans collaborate to design stronger VBP programs, paired with a strong focus on evaluation, is recommended to advance VBP in Hawaiʻi.

Project 3A: Community Integration Services (CIS)

Project 3A evaluated the provision of community integration services (CIS) program to members with qualifying health conditions who experience or are at-risk of experiencing homelessness. MQD hypothesized that these services would result in better health outcomes and lower utilization of acute care services, increase utilization of outpatient care services, and lower total cost of care after being stably housed. Participating beneficiaries were expected to improve in health and wellbeing as they progressed through the program. Moreover, MQD expected the effectiveness of the CIS program to vary depending on client characteristics.

Results show that health plans targeted the intended population-members with complex health and housing needs for inclusion in CIS program. Members identified for CIS had much higher average annual emergency department visits and total cost of care relative to the average Medicaid member. However, due to reporting inconsistencies, the evaluation team was unable to determine with certainty how many members received tenancy and pre-tenancy services. Reported data suggest that many eligible members have yet to receive services due to backlog and lack of Homeless Service Provider (HSP) capacity. Given that members who were eligible for services but not receiving them had the highest average total cost of care, addressing this backlog will be necessary to have systems-level impact on cost of care which can be attributed to this project. Additionally, while one third of members who were in pre-tenancy had transitioned to tenancy at exit, available recipient-level data does not indicate whether this transition represents stable housing or whether these members ever received services, suggesting the need for better tracking of housing outcomes.

Many of these challenges reflect those seen in other states, and substantial progress has been made in refining the program to address and mitigate these challenges. MQD began ‘rebooting’ CIS in January 2023. The ‘reboot’ approach has resulted in more providers applying for MQD provider status, including clean and sober programs, and increased collaboration among MQD, health plans, HSPs, and other systems involved in homelessness services. Additionally, given the complexity of integrating the healthcare and social service sectors, MQD and partners implemented rapid-cycle assessments (RCAs) that provide continuous evaluation in real-time to encourage program and data quality improvement and ongoing collaboration. Continued monitoring and evaluation support after the demonstration period will allow MQD to monitor the CIS project’s long-term outcomes.

Project 3B: Assessing Process of Planning and Implementing Support Strategies Addressing Social Determinants of Health

Project 3B aimed to understand how MQD has influenced the ecosystem of strategies and interventions that address social determinants of health (SDOH). The evaluation focused on MQD’s development of the statewide SDOH Transformation Plan; MQD’s translation of its SDOH goals into its managed care contract and subsequent requirements for health plans to develop and adopt SDOH Work Plans; and health plans’ actual work to date in implementing strategies and interventions on the ground that support SDOH efforts in general, and attempt to reduce identified health disparities specifically.

During the demonstration period, MQD included a number of SDOH requirements in the health plans’ managed care contracts; implemented reports that require health plans to identify, document, and evaluate their SDOH interventions; and developed a statewide SDOH Transformation Plan. This plan is in alignment with the state’s HOPE and quality strategies, and serves as a road map to address health disparities comprehensively and systematically.

The evaluation team identified several promising strategies and interventions at multiple levels (i.e., at the levels of members, providers, community, and the healthcare system) that focus on addressing various social risk factors, such as housing insecurity, food insecurity, and other social needs. Foci include strategies and interventions that address the root causes of SDOH and improve SDOH data collection and outcome measurement. However, the quality, depth, and breadth of such strategies varied significantly across health plans. Implementation of the State’s SDOH Transformation Plan in future demonstration waivers will allow for continued monitoring on the impact of the state’s coordinated and systematic approaches to identifying and targeting social risk factors and reducing health disparities.

Project 4A: Improve Data Quality for Immunization-Related Performance Measures

Project 4A aimed to evaluate progress in any area, including quality of care, identified as needing improvement during the previous demonstration period. The joint MQD-Department of Health (DOH) Hawaiʻi Immunization Registry (HIR) project planned to increase the accuracy and completeness of childhood immunization data and increase childhood immunization coverage for Hawaiʻi Medicaid beneficiaries. This particular initiative was not launched and therefore, not evaluated; although MQD obtained funds to support the implementation of a new HIR, the COVID-19 pandemic response reduced DOH’s capacity to focus on this project, and funds expired before the work could begin.

Recommendations

Based on findings from this evaluation, and following the goals stated by the HOPE initiative, we make the following thirteen recommendations to MQD to further develop the six priority areas.

General

Recommendation 1. Continue revision and improvements of reporting and measurement methodologies, focused on reducing reporting burden while capturing crucial process and outcome metrics that align across health plans that are informed by feedback from multiple stakeholders, including members and providers. Expand the use of rapid cycle assessments s to other novel program implementations as needed.

Recommendation 2. Focus on developing a systematic process for incorporating member feedback into evaluation, program development, and program improvement.

Primary Care

Recommendation 3. Implement spend targets that encourage use of primary care visits and increase use of beneficial primary care services. As currently utilization of primary care visits, primary care supports and beneficial care services declined since 2019 (likely in large part due to the COVID-19 pandemic, and potentially a member population shift), health plans need to refocus on strengthening the implementation of interventions already in place.

Recommendation 4. Investigate both qualitatively and quantitatively the reasons for the decline in utilization of and spending on primary care, and how these trends might affect outcomes over time.

Care Coordination for Beneficiaries with Complex Conditions

Recommendation 5. Provide increased clarity on conceptualization and operationalization of care coordination. Define which care coordination services are offered, which are most needed, and how members view the impact of care coordination on their own lives. These changes are needed to improve engagement in healthcare coordination services and consequently increase the impact of the program.

Recommendation 6. Develop a standardized data collection and reporting system for care coordination to support the most parsimonious metrics capturing the delivery and dose of care coordination services on individual, provider, and organizational levels.

Home- and Community-Based Services

Recommendation 7. Tailor care strategies based on the specific characteristics of home-based care and foster home care. By taking into account the differences in these environments, healthcare professionals can provide more effective and personalized care that aligns with the distinct needs and preferences of the individuals receiving support.

Recommendation 8. Continue to offer At-Risk services, and other Home and Community Based Services in the home setting. Encourage and support home-based care to the extent feasible and evaluate factors contributing to the more rapid functional declines observed in nursing home- and community-based foster home settings.

Value-Based Purchasing

Recommendation 9. Increase collaboration to further evaluate and expand APM models to higher levels of the APM Framework amongst health plans, providers and MQD. In accordance with the HOPE initiative, further expand risk sharing and population-based payment arrangements beyond currently implemented models that are predominantly pay-for-performance based on fee-for-service structures. Consider the impact of payment models on provider experience, with specific attention to how providers are supported by payment models and how administrative burden on providers can be reduced.

Community Integration Services (CIS)

Recommendation 10. Continue considering the role of CIS in the context of the overall housing system of care. Given the high level of need and low capacity, it will likely be necessary for health plans to prioritize eligible members. The evaluation team suggests that MQD and health plans examine existing gaps in the homelessness service system when identifying priority members. CIS might be most effective when paired with other less intensive programs that serve high needs people to optimize use of resources.

Recommendation 11. Define ‘stably housed’ and continue to build in mechanisms to capture housing status of CIS members throughout the program. The CIS reboot has already added some of these metrics to the CIS Action Plan, including exit destinations.

Recommendation 12. Strengthen data collection, integrate data to enable more comprehensive views of CIS members, and address data inconsistencies.

Social Determinants of Health

Recommendation 13. Educate MQD and health plan staff about SDOH with resources provided by MQD. Additionally, MQD should provide more resources to aid health plans in monitoring progress across SDOH interventions.

I. Background

The State of Hawaiʻi, Department of Human Services (DHS), Med-QUEST Division (MQD) is Hawaiʻi's Medicaid agency. MQD first implemented QUEST (Quality care, Universal access, Efficient utilization, Stabilizing costs, and Transforming the way health care is provided) on August 1, 1994. QUEST was a statewide Section 1115 demonstration project that initially provided medical, dental, and behavioral health services through a competitive managed care delivery system.

Since its implementation, CMS has renewed the QUEST demonstration five times. CMS approved Hawaiʻi's most recent request to extend the Section 1115 demonstration project titled "Hawaiʻi QUEST Integration" ("demonstration") (Project No. I l-W-00001/9) in July 2019, with an effective date of August 1, 2019 running through July 31, 2024.

The current demonstration continues to use capitated managed care as a delivery system. QUEST Integration provides Medicaid State Plan benefits and additional benefits (including home- and community-based long-term-services and supports) to beneficiaries eligible under the state plan and to the demonstration populations. In addition to the QI health plans, a separate behavioral health organization (BHO) provides beneficiaries with a diagnosis of serious mental illness (SMI) or serious and persistent mental illness (SPMI) with specialized and non-specialized behavioral health services.

MQD is using this demonstration as a vehicle to implement the Hawaiʻi ʻOhana Nui Project Expansion (HOPE) Initiative, an effort that furthers MQD's mission to "*empower Hawaiʻi's residents to improve and sustain wellbeing by developing, promoting and administering innovative and high-quality healthcare programs with aloha*." The following principles guide the HOPE Initiative as well as the provision of services under the demonstration:

- Assuring continued access to health insurance and health care;
- Emphasizing whole person and whole family care over their life course;
- Addressing the social determinants of health;
- Emphasizing health promotion, prevention and primary care;
- Emphasizing investing in system-wide changes; and
- Leveraging and supporting community initiatives.

These principles are implemented through four focused strategies under the HOPE Initiative that are largely the same or related to the objectives under the demonstration. Those strategies include:

- Investing in primary care, prevention, and health promotion;
- Improving outcomes for high-need, high-cost individuals;
- Supporting payment reform and alignment; and
- Supporting community driven initiatives to improve population health.

The HOPE Initiative serves as both the foundation and a primary organizing principle for the demonstration and our evaluation of it. For example, our focus on primary care and social determinants of health is inspired by HOPE and will be effectuated through the managed care authorities in the demonstration. The principles and strategies outlined in HOPE build on the successes of previous reform efforts and are meant to leverage community initiatives and resources, while maximizing return on investment and ensuring broad community support beyond Medicaid.

This evaluation report represents the first four years of the 5-year HOPE Initiative (2019–2023). The report serves as the external evaluation of Hawaiʻi's 1115 waiver and was conducted by the University of Hawaiʻi at

Mānoa (UH) Social Science Research Institute (SSRI). The evaluation encompasses all populations described in the Special Terms & Conditions and meets CMS's report requirements (see box I.1).

Box I.1. CMS requirements

This evaluation report meets CMS's requirements stated in their approval letter to The State of Hawaiʻi, DHS-MQD under section XI.51.D. Evaluation Activities and Interim Findings: *"Per 42 CFR 431.428, the Monitoring Reports must document any results of the demonstration to date per the evaluation hypotheses. Additionally, the state must include a summary of the progress of evaluation activities, including key milestones accomplished, as well as challenges encountered and how they were addressed. The discussion must also include interim findings, when available; status of contracts with independent evaluator(s), if applicable; status of Institutional Review Board approval, if applicable; and status of study participant recruitment, if applicable."*

Demonstration Objectives

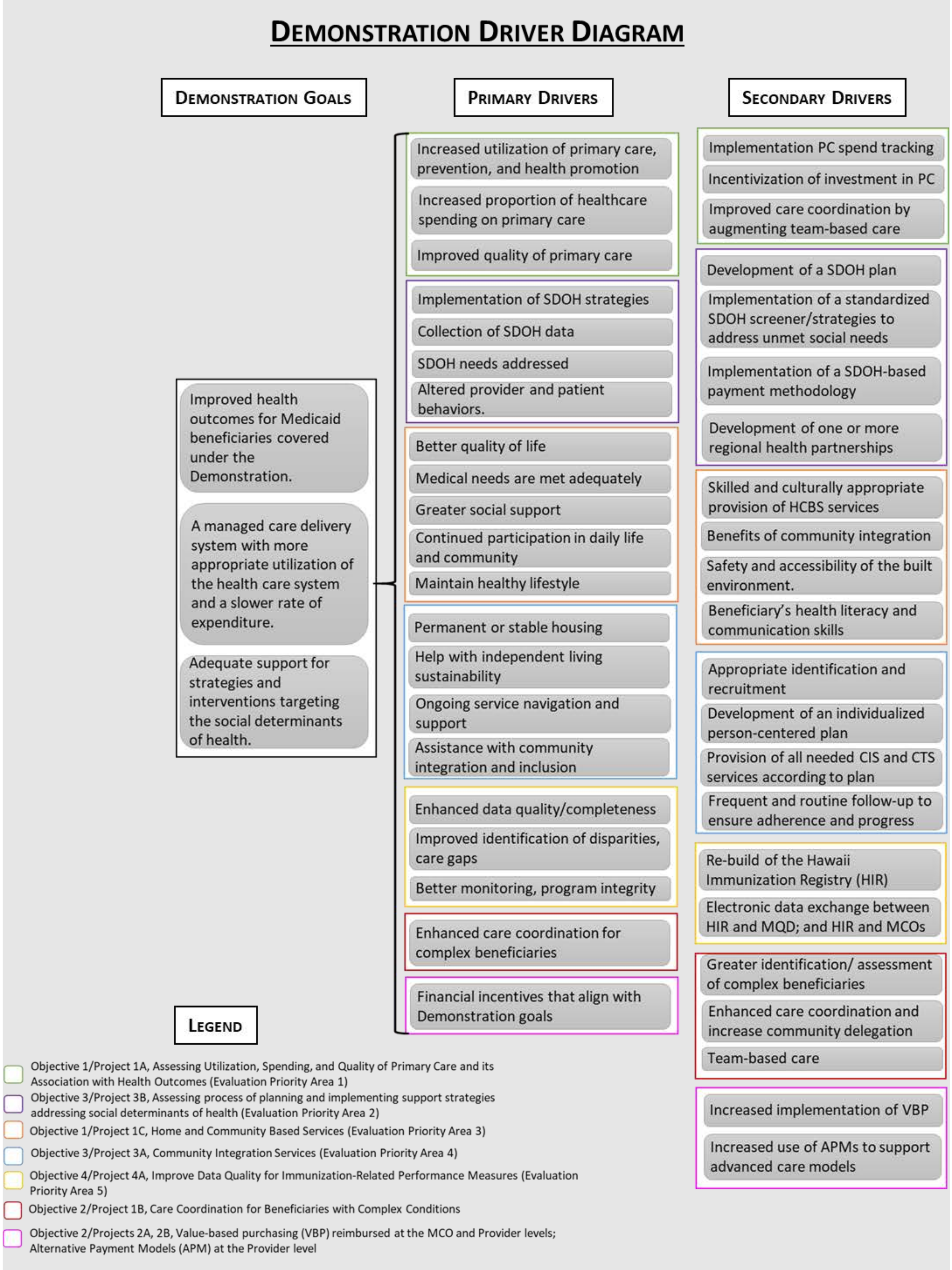
Med-QUEST Division (MQD) consolidated and updated previous demonstration objectives in order to align past efforts with future goals as framed by the HOPE Initiative. Through this process, the following objectives for the current extension of the demonstration were proposed:

1. Improve health outcomes for Medicaid beneficiaries covered under the demonstration;
2. Maintain a managed care delivery system that leads to more appropriate utilization of the healthcare system and a slower rate of expenditure growth; and
3. Support strategies and interventions targeting the social determinants of health.

Proposed Demonstration Driver Diagram

MQD developed a demonstration driver diagram, emphasizing the primary and secondary "drivers" to meet demonstration goals (Figure I.1). These drivers can be organized into four priority areas of evaluation: primary care, social determinants of health, home- and community-based services, and community integration services. Each priority area is described in detail subsequently.

Figure I.1.Proposed Demonstration Driver Diagram



II. Demonstration Objectives and Evaluation Hypotheses

Demonstration Evaluation Hypotheses

During initial planning of the HOPE Initiative, MQD worked extensively with internal and external stakeholders to develop a comprehensive plan for measurement and evaluation. This plan was designed to assess the effectiveness of the demonstration in meeting its objectives. The evaluation documents the overall impact of the demonstration on Hawaiʻi's Medicaid delivery system while simultaneously providing a more in-depth examination of the six previously described priority areas. Specific elements of the proposed demonstration required modifications and/or were not fully implemented. These modifications are further discussed in the results section. Key modifications included the removal of a SDOH based payment methodology and vaccine registry from the evaluation performed.

The table below summarizes key evaluation projects to support each demonstration objective. Project-level details for each hypothesis, including information on specific target populations, research questions, data strategy, sources and collection frequency, measures, statistical framework, and subgroup analyses (if any) are described in detail in Section IV: Project-Level Detail.

All evaluation research questions and hypotheses promote the objectives of *Title XIX* by assessing whether providing high quality, accessible services to individuals with low income improves their health outcomes during the demonstration. In addition, these hypotheses collectively assess progress toward the Institute for Healthcare Improvement's Triple Aims: improved health, improved quality of care and reduced costs–the primary focus of the demonstration as well as a core tenet of the HOPE Initiative.

Table II.1. Evaluation Projects by Demonstration Objectives and Hypotheses

Demonstration Objectives	Demonstration Hypotheses	Key Evaluation Projects
1. Improve health outcomes for Medicaid beneficiaries covered under the demonstration	H1.1: Increasing utilization for primary care, preventive services, and health promotion will reduce the prevalence of risk factors for chronic illnesses and lower the total cost of care for targeted beneficiaries.	Project 1A: Assessing Utilization, Spending, and Quality of Primary Care and its Association with Health Outcomes
	H1.2: Improving care coordination (e.g., by establishing team-based care and greater integration of behavioral and physical health) will improve health outcomes and lower the total cost of care for beneficiaries with complex conditions (i.e., high-needs, high-cost individuals).	Project 1B: Care Coordination for Beneficiaries with Complex Conditions
		Project 1C: Home- and Community-Based Services (HCBS)
2. Maintain a managed care delivery system that leads to more appropriate utilization of the healthcare system and a slower rate of expenditure growth	H2: Implementing alternative payment methodologies at the provider level and value-based purchasing reimbursement methodologies at the health plan level will increase appropriate utilization of the healthcare system, which in turn will reduce preventable healthcare costs.	Project 2A: Value-based purchasing (VBP) reimbursed at the health plan and Provider levels
		Project 2B: Alternative Payment Models (APM) at the Provider level
	H3: Providing community integration services and similar initiatives for vulnerable and at-risk adults and families will	Project 3A: Community Integration Services (CIS)

3. Support strategies and interventions targeting the social determinants of health	result in better health outcomes and lower hospital utilization.	Project 3B: Assessing the process of planning and implementing support strategies addressing social determinants of health

A table providing a comprehensive crosswalk of demonstration objectives, demonstration hypotheses, projects, and research questions is included in Appendix I.

In addition to project-level research questions and hypotheses, the evaluation team assessed overall waiver impacts related to objectives and project activities. In particular, we asked 1) which chronic conditions were most prevalent among Medicaid members; 2) whether members could be grouped into naturally occurring clusters based on conditions for which they received treatment in the past year; and 3) if members transitioned from one group or cluster to another over a four-year period (2017–2021)

III. Demonstration Priority Areas Detail and Project Level Overview

The prior demonstration provided expenditure authority for additional benefits that were continued into the current demonstration term. In addition, this demonstration intended to expand Community Integration Services (CIS) from the previous demonstration, to add a Community Transition Services (CTS) pilot program, which would provide transitional case management services, housing quality and safety improvement services, legal assistance services, and secure house payments for individuals meeting criteria for CIS. Two priority areas were further articulated by MQD and the evaluation team with regard to the evaluation of Care Coordination and Value-Based Health care, resulting in a total of six evaluation priority areas that align with the planned demonstration projects.

Priority areas included 1) Primary Care, 2) Care Coordination for Beneficiaries with Complex Conditions, 3) Home- and Community-Based Services, 4) Value-Based Purchasing, 5) Community Integration Services, and 6) Social Determinants of Health. The original evaluation design included a supplemental evaluation priority: improve data quality for immunization-related performed measures; this evaluation remained uninitiated because the project that MQD proposed for evaluation was canceled due to the COVID-19 pandemic.

This section summarizes the priority areas, the connected evaluation projects, and the planned evaluation approach. A comprehensive overview of the original evaluation plan per project is provided in Appendix I. During the evaluation, we made adjustments to these plans as described in detail in the results section of this report as described in detail in the results chapter of this report.

Evaluation Priority Area 1: Primary Care

Evaluation Priority Area 1 is closely tied to the HOPE Initiative, as well as one of MQD's demonstration objectives–the promotion of appropriate utilization of the health care delivery system. Specifically, the evaluation focused on the impact of the HOPE "Advancing Primary Care Initiative'' to support this strategy and achieve the overall goals of the demonstration. The Advancing Primary Care Initiative aims to increase utilization of primary care, preventive services, and health promotion; to increase the proportion of healthcare spending on primary care, and to improve the quality of primary care and outpatient services. To achieve these aims, MQD proposed three key activities for health plans to conduct: 1) track primary care spending across multiple definitions of primary care spend, 2) incentivize investment in primary care, e.g., through performance incentive payments to providers as well as value-based purchasing, and 3) improve care coordination through supporting and augmenting team-based care in patient-centered medical homes, community health centers, clinically integrated health systems, and other entities.

MQD hypothesized that these activities would increase utilization of, spending on, and quality of primary care services, preventive services, and health promotion services, which in turn would improve measures of relevant health outcomes.

- The priority area "Primary Care" was included in this evaluation as Project 1A: Assessing Utilization, Spending, and Quality of Primary Care and its Association with Health Outcomes.

Project 1A was aimed at increasing utilization for primary care, preventive services, and health promotion. The UH evaluators planned to select relevant outcome indicators based on literature review and stakeholder consultation with providers and beneficiaries. We planned to use administrative data for analysis including encounter, claim, and beneficiary-level report data regarding primary care utilization, spending, and quality measures, as well as beneficiary sociodemographic characteristics. Additionally, we planned to use measures of patient satisfaction and patient-reported outcomes e.g., Consumer Assessment of Healthcare Providers and Systems (CAHPS).

Evaluation Priority Area 2: Care Coordination for Beneficiaries with Complex Conditions

MQD has implemented a care coordination program for individuals with complex care needs. Care coordination supports individuals with complex health needs to navigate the complexities of our health care system, access high quality preventative care, manage chronic conditions, and address social risk factors. The 1115 waiver demonstration hypothesized that, "improving care coordination (e.g., by establishing team-based care and greater integration of behavioral and physical health) will improve health outcomes and lower the total cost of care for beneficiaries with complex conditions (i.e., high-needs, high-cost individuals)."   Care Coordination included a new initiative focused on enhancing care coordination for beneficiaries with complex conditions. Members qualify by meeting criteria such as having multiple chronic conditions, comorbid behavioral and physical health conditions, high-risk pregnancies, or unmet social needs.

- The priority area "Care Coordination for Beneficiaries with Complex Conditions" was included in this evaluation as Project 1B: Care Coordination for Beneficiaries with Complex Conditions.

Project 1B was aimed at improving care coordination (e.g., by establishing team-based care and greater integration of behavioral and physical health. The evaluation plan proposed testing the waiver demonstration hypothesis by evaluating health outcomes of two health coordination programs, each with their own research questions. The UH evaluation team planned to use administrative data including encounter, claim, and beneficiary-level report data regarding utilization, spending, and quality as well as beneficiary sociodemographic characteristics in the analysis.

In collaboration with MQD, the evaluation team guided in the development of a reporting system for the health plans to report care coordination services provided to members with special health care needs/enhanced health care needs (SHCN/EHCN). This supported the operationalization of care coordination, contract monitoring of these services, and quality improvement.

The second care coordination program will be described in Evaluation Priority Area 3.

Evaluation Priority Area 3: Home-and Community-Based Services

MQD provides long-term services and supports (LTSS) in the demonstration by allowing beneficiaries who meet an institutional level of care to choose between institutional services or Home- and Community-Based Services (HCBS). Access to LTSS is based on a functional level of care (LOC) assessment performed by the health plans or those with delegated authority. Each beneficiary who has a disability and who requests or receives LTSS receives a functional assessment; the assessment is repeated for LTSS members at least every twelve months, or more frequently when there has been a significant change in the beneficiary's condition or circumstances. In addition, an LTSS member may request a functional assessment at any time.

HCBS are offered individuals who meet an institutional level of care as well as individuals at risk of deteriorating to an institutional level of care. The at-risk population is defined as Medicaid beneficiaries who do not meet criteria for nursing facility level of care (NF LOC), but who are assessed to be at risk of deteriorating to the nursing facility (institutional) level of care. MQD hypothesized that HCBS would improve health and reduce costs for individuals who meet an institutional level of care requirement and those "at risk" of deteriorating to the institutional level of care.

- Priority area 3 "Home-and Community Based Services" is evaluated as project 1C: Home- and Community-Based Services (HCBS)

Project 1C was aimed at improving home- and community-based services (HCBS). The evaluation plan proposed testing the waiver demonstration hypothesis by (1) comparing the population receiving HCBS services that meets criteria for NF LOC with the population receiving institutional care; (2) investigating subgroup differences in health outcomes and total cost of care among HCBS users who meet the criteria for NF LOC; and (3) investigating subgroup differences in health outcomes and total cost of care among the at-risk population. This knowledge could lay the foundation for policy efforts to promote independence, community integration/re-integration of LTSS beneficiaries, and re-balancing of LTSS services towards HCBS where feasible.

We planned to base analyses on administrative data for analysis including encounters, claims, and beneficiary-level report data such as long-term services and supports (LTSS) utilization, Hawai'i's health and functional assessment used to assess the health status of LTSS beneficiaries, and sociodemographic characteristics. Further, we planned to collect patient-reported health outcomes annually and as changes occurred.

Evaluation Priority Area 4: Value-Based Purchasing (VBP)

Value-based purchasing (VBP) incentivizes quality and whole-person care. VBP concerns arrangements between the purchaser and the contracted organization that holds a provider, or alternatively a health plan, accountable for both the costs and the quality of care. During this demonstration period, MQD strongly emphasized payment transformation and initiated data reporting by health plans on their VBP arrangements with providers in order to track advancement towards alternative payment models (APMs) under the Healthcare Payment Learning and Action Network's APM Framework. As such, MQD implemented VBP strategies at the health plan level, and encouraged health plans to implement VBP arrangements at the provider level. MQD hypothesized that, "implementing APMs at the provider level and VBP methodologies at the health plan level will increase appropriate utilization of the health care system, which in turn will reduce preventable healthcare costs."

- Priority area 4: "Value-Based Purchasing" was evaluated as project 2A and 2B: Value-Based Purchasing (VBP) Reimbursed at the Health Plan and Provider Levels

Projects 2A and 2B were aimed at the APM implementation at the provider level and VBP reimbursement methodologies at the health plan level. The proposed strategy for analyses included the use of administrative data on encounters, health plan-level quality data, and beneficiary-level report data (including beneficiary-level quality information). The evaluation team planned to use health plan-level VBP data, and health plan data on provider-level VBP adoption and results, beneficiary-provider attribution data, and encounter data to identify beneficiaries served and services provided under different VBP structures.

To evaluate the progress towards payment methodologies based in value, the evaluation team had access to the newly developed Value Based Health Care (VHC) reports submitted by health plans to map their current VBP/APM implementation status and used MQD's documentation to map implementation of APMs at the health plan level.

Evaluation Priority Area 5: Community Integration Services

Community Integration Services (CIS) aim to decrease utilization of acute services (emergency and inpatient utilization), increase engagement with outpatient care services, and decrease the total cost of care by providing members with tenancy sustaining or pre-tenancy services. To assess progress toward program goals, the evaluation design focused on both program process and outcomes/impacts associated with participation in the CIS program. MQD hypothesized that provision of these services would result in better health outcomes and lower utilization of acute services, increased utilization of outpatient care services, and lower total cost of care after being stably housed. Participating members were expected to improve in health and well-being as they progressed through the program. MQD expected the effectiveness of the CIS program to vary depending on client characteristics.

- Priority area 5 "Community Integration Services (CIS) was evaluated as project 3A. Community Integration Services (CIS).

Project 3A was aimed at providing a Community Integration Services (CIS) program and similar initiatives for vulnerable and at-risk adults and families. The evaluation team planned to use administrative data, including encounters, claims, and beneficiary-level report data such as CIS utilization, functional assessments, and sociodemographic characteristics.

For the process evaluation, the evaluation team monitored program implementation and assessed program fidelity, providing regular feedback to the program providers, and recommended adaptations when warranted through rapid-cycle assessments (RCAs). The evaluation team held quarterly meetings with MQD, health plans, and homeless service providers to discuss quarterly data and to engage in group problem-solving. These quarterly meetings provided opportunities for gathering process measures, discussing challenges with implementation, sharing best practices and success stories, and presenting RCA findings from health plans submitted quarterly reports. The evaluation team attended, supported, and participated in quarterly meetings, and used these meetings to engage with stakeholders to help contextualize the findings of RCAs and support performance improvement initiatives. The evaluation team also submitted a quarterly report to MQD detailing these findings and meeting discussions. The outcomes evaluation assessed the effectiveness of the program by examining provider-level and participant-level outcomes (e.g., physical/mental health, health care utilization) as well as healthcare utilization outcomes (e.g., number of emergency department visits).

The evaluation team further planned data collection through the Housing and Case Management Assessment Tool (obtained through direct interview with clients), the Homeless Management Information System (HMIS), and a contact hours and fidelity checklist. Planned data collection also included the eligibility screener and other data collection forms used by health plans.

Evaluation Priority Area 6: Social Determinants of Health

Social determinants of health (SDOH) refer to the conditions in which people are born, grow, live, work and age that shape health. Socio-economic status, discrimination, education, neighborhood and physical environment, employment, housing, food security and access to healthy food choices, access to transportation, social support networks and connection to culture, as well as access to healthcare are all determinants of health. These factors impact social groups differently, which leads to disparities in health outcomes. Furthermore, the island geography and historical context of Hawaiʻi has given rise to great diversity at the local community level.

Addressing SDOH has been a key guiding principle for MQD in achieving the goals of the HOPE strategy (MQD, 2017). During the 1115 waiver demonstration period, MQD intended to develop integrated solutions to address SDOH within the context of the healthcare delivery system.

- Priority area 6: "Social Determinants of Health" is evaluated as project 3B: Assessing Process of Planning and Implementing Support Strategies Addressing Social Determinants of Health

Project 3B was aimed at evaluating the implementation of strategies addressing the social determinants of health. MQD formulated three main research questions: 1) What kinds of support strategies and interventions addressing the social determinants are chosen by health plans and how do these strategies translate to provider and patient outcomes; 2) In what ways did health plans develop and adopt a Social Determinants of Health (SDOH) Work Plan within their Quality Assessment and Performance Improvement (QAPI) plans? and 3) In what ways did the state develop the SDOH Statewide Transformation Plan? The evaluation team planned to approach these questions through a realistic evaluation approach to understanding how MQD has influenced the ecosystem of strategies and interventions that address SDOH in the state. The evaluation team planned to answer the research questions through a qualitative methodology including in-depth interviews with purposely chosen stakeholders from health plans, Regional Health Partnerships (if any) and providers.

Supplemental Evaluation Objective (Evaluation Priority Area 7): Improve Data Quality for Immunization-Related Performance Measures

Improving the overall health of children by boosting immunization rates is a goal of both the Department of Human Services (the department that houses MQD) and the State of Hawaiʻi as a whole. To help achieve this goal, MQD entered into a collaborative partnership with the Hawaiʻi State Department of Health's Immunization Branch (housed within the Disease Outbreak Control Division) in 2019 to design, develop, and implement a new immunization information system (IIS), the Hawaiʻi Immunization Registry (HIR).

Although an existing IIS was previously in use in the state of Hawaiʻi, that system became non-operational in August 2018. As a result, MQD, MCOs and Medicaid providers were unable to obtain information on childhood immunization status that was necessary to support pay-for-performance clinical quality measures used to determine value-based reimbursement. Historically, MQD plans have been incentivized to promote immunization among Medicaid beneficiaries and relied on the IIS for clinical quality measure values.

While the previous IIS allowed for basic clinical quality measure reporting, MCOs and Medicaid providers requested modifications and upgrades be built into any future IIS in order to improve the ease of IIS querying and other functions related to required Medicaid reporting. In early 2019, MQD began working in collaboration with the DOH Immunization Branch to replace the pre-2018 system to support the needs of both MQD and DOH.

- Priority area 7 "Improve Data Quality for Immunization-Related Performance Measures" was intended to be included as project 4A (Supplemental Project): Improve Data Quality for

Immunization-Related Performance Measures. However, the project was not launched due to COVID-19.

Project 4A was aimed at measuring progress in any area, including quality of care, that had been identified as needing improvement during the previous demonstration period. This particular initiative was not launched and therefore not evaluated; although MQD obtained funds to support the implementation of a new HIR, the DOH's capacity changed when the COVID-19 pandemic began and funds expired before the work could begin.

This evaluation area intended to report on the collaboration, and resultant improvements to the HIR.

IV. Evaluation Methodology

The demonstration addresses a wide range of strategies and interventions to promote healthy outcomes and reduce costs. Accordingly, the evaluation utilizes a variety of research and statistical approaches to assess the impacts and outcomes of the demonstration interventions and strategies. This section outlines overarching elements of the evaluation design that cut across several of the research questions and evaluation priorities.

Evaluation Design

The evaluation took a mixed-methods approach using both quantitative and qualitative methods. Random assignment of participants (i.e., Medicaid beneficiaries) to programs (i.e., benefits) to establish control and treatment groups was not feasible and generally not ethical. Therefore, many of the evaluation priority areas used a within-group design. Additionally, the evaluation focused on both process and outcomes. For several of the evaluation questions and priority areas, the evaluation team conducted a process evaluation to better understand program implementation and components, health plan-specific differences, progress and process of a new initiative and/or to document program fidelity. For example, the first phase of the Community Integration Services (CIS) evaluation involved a qualitative analysis to increase understanding of a process or to monitor project implementation. The second phase then involved a quantitative study using data reported quarterly by health plans, and administrative or claims data. In other cases, the quantitative analyses occurred first, followed by qualitative interviews with health plan or MQD staff to further clarify the information generated in the quantitative study. When possible, the evaluation design utilized quasi-experimental statistical methods. These methods are discussed in further detail in each priority area section below.

Target and Comparison Populations

Certain evaluation questions necessitated analysis of outcomes for all Medicaid beneficiaries (e.g., when assessing total primary care investments at the state or health plan). However, some questions targeted specific subgroups of beneficiaries (e.g., people experiencing homelessness, nursing home residents, groups with chronic conditions, etc.). Therefore, comparison populations chosen for each analysis varied and are described in greater detail in each priority area section below.

Evaluation Period

The evaluation period used data from the current demonstration period (2019-present) and also included data from the past demonstration period where necessary. Years one-through-three (2019–2021) of the evaluation focused primarily on gaining familiarity with the implementation of each priority area objective through the review of guidance materials, meetings with MQD staff, and meetings with health plans. This preliminary work permitted the evaluation team to develop logic models and theories of change for each priority area. These materials were vetted by relevant stakeholders and in some cases, adapted over the evolution of the programs.

Next, the evaluation team and MQD collaborated in the design of health plan report templates. The purpose of these reports was to acquire process and outcome data not accessible through other data sources. These reports were much more robust than prior reporting tools, and incorporated member- and provider-level data for the first time. The evaluation team assisted with development of key performance indicators and report manuals, and trained MQD staff in the use of the new reporting templates. The evaluation team also began co-reviewing quarterly and annual report submissions alongside MQD staff. These report review sessions allowed for rapid feedback, encouraged data integration, and enhanced the evaluation team's knowledge of programmatic implementation details between and among health plans.

Through the review of these reports, it became clear that data quality was a substantial issue. The evaluation team took part in technical assistance sessions to train health plan staff on improving data quality, discussing the importance of high-quality data to enhance the ability to assess evaluation outcomes and serve the member population. The evaluation team subsequently participated in regular meetings to review data quality and co-review reports with MQD staff.

Using data collected from these reports, the evaluation team met regularly with health plans and MQD staff to discuss findings. For CIS, rapid-cycle assessments (RCAs) were performed quarterly throughout years two, three, and four of the evaluation. RCA activities proved both formative and summative, focusing on early accomplishments as well as identifying areas of concern to be addressed. For MQD care coordination initiatives and long-term services and supports (LTSS), data quality from reports was repeatedly found insufficient to draw conclusions, and the co-review of reports and quarterly feedback to health plans focused heavily on strategies to enhance data quality and reduce incompleteness. When possible, the evaluation team asked health plans to explain certain service provision metrics, such as the reasons for low enrollment of members in a particular initiative or priority area, or reasons for ostensibly low provision of services. In year four, health plans provided the evaluation team with a data extract from their various systems. These extracts illustrated the diverse data types collected by each health plan and were used primarily for the care coordination evaluation.

Over years two and three, the evaluation team began achieving familiarity with the types of administrative, claims, and encounters data available through MQD (see Data Sources below), as well as evaluation used to determine service eligibility in LTSS, CIS, and care coordination programs (including but not limited to the population with special health care needs). In year two, Health Effectiveness Data and Information Set (HEDIS) and other quality measure data were used to define metrics for the social determinants of health disparities report. In year 3, the evaluation team gained access to the Hawaiʻi Level of Care (HILOC) database and began conducting preliminary analyses, understanding the complexities of the data, and working to answer the evaluation questions for LTSS/HCBS. In year four, encounter data were extracted to link process-oriented metrics and outcome metrics to answer the proposed evaluation questions. Year five has focused on developing and refining the report and recommendations.

Evaluation Measures

The evaluation used a variety of data sources and measures, including quantitative and qualitative sources. Much of the quantitative data was collected from existing databases. Quantitative measures included the Level of Care (LOC) and Health and Functional Assessment (HFA) data, measures of patient-reported health outcomes (PRO), reporting tools, quality measures, actuarial risk scores, and demographic and medical background factors, and cost data available in the administrative encounter data set. The evaluation team used data on age, health status, gender, and functional limitation measures from claims, encounter, or assessment sources for matching purposes.

Some of the quantitative data was obtained by the UH evaluation team through health plan reports newly implemented over the demonstration period. These data included existing measures reported quarterly or annually by the health plans. For example, several CIS assessment items reported quarterly included measures from the Patient Reported Outcomes Measurement Information System (PROMIS; https://commonfund.nih.gov/promis/index) and the Centers for Disease Control and Prevention (Healthy Days Measure: https://archive.cdc.gov/#/details?url=https://www.cdc.gov/hrqol/hrqol14_measure.htm).

Administrative data from encounters, claims, and beneficiary-level reports were also used to assess the impact of value-based purchasing (VBP) reimbursement methods at the health plan and provider levels, as well as improvements in health outcomes for the evaluation of multiple objectives.

Qualitative data was collected both formally and informally through periodic reports from health plans regarding program implementation, data limitations and barriers. We also conducted in-depth interviews with health plans and presented periodic rapid-cycle assessments to foster dialog with program stakeholders.

Detailed descriptions of evaluation data sources appear in Appendix II.

Analytic Methods

In the absence of adequate control groups (and in some cases, comparison groups), the evaluation relied on quasi-experimental methods, such as within-group pre-post analyses, matching, and subgroup analyses to understand in greater depth how beneficiaries from different subgroups (e.g., age, ethnicity, disease states) respond to the initiatives in the demonstration.

Analytic Considerations

Our evaluation approaches were continually informed by results from the rapid-cycle assessments (e.g., for CIS) and on-going review of health plan data submissions and subsequent meetings. Further, interim evaluation report findings contributed to the summative report and our long-term program planning. At each stage of the evaluation process, we reexamined findings from previous reports to consider the interrelations among the demonstration projects and the other aspects of the state's Medicaid program. We also reexamined findings in relation to those from other Medicaid demonstrations and federal awards affecting service delivery, health outcomes and the cost of care under Medicaid. This approach allowed us to consider system-wide impacts that affect service delivery, health outcomes, and cost of care, to make judgments about the demonstration using evaluative reasoning, and inform Medicaid policymakers, advocates, and stakeholders at both the state and national levels.

Ethical and Data Security Considerations

This evaluation was classified as Not Human Subjects Research, as it was considered a Quality Improvement (QI) and Quality Assurance (QA) project. A complete description of methods to determine if a project is Human Subjects Research or QI/QA (or both) can be found in Bass and Maloy (2020). Our project was approved by the University of Hawaiʻi Institutional Data Governance Office to ensure that sensitive data was held, handled and monitored in accordance with strict standards of data confidentiality and security.

V. Results

Section 0. Evaluation of population demographics

The evaluation examined outcomes at the project level as well as across the entire Medicaid population. In this report, we will first provide a brief overview of Medicaid population demographics during the evaluation period. The following description of the Medicaid population demographics is based on an enrollment snapshot taken July 24, 2023. Table V.01a and VI.01b demonstrate the enrollment distribution per population group and health plan.

Table V.0.1a. Enrollment characteristics on July 24, 2023

	O'ahu	**Kaua'i**	**Hawai'i**	**Maui**	**Moloka'i**	**Lāna'i**	**Statewide**
01-Children	77,461	7,578	27,378	14,866	1,324	342	**128,949**
02-CHIP	12,540	2,167	4,365	3,835	228	99	**23,234**
03-Current and Former Foster Care	3,881	355	1,576	622	89	13	**6,536**
04-Pregnant Women	2,171	209	599	429	24	NR	**3,440**
05-Parents/Caretakers	27,938	3,079	10,768	5,061	480	73	**47,399**
06-Adults	109,385	10,361	34,978	21,254	1,380	315	**177,673**
07-ABD (Adult, Non-Pregnant)	40,592	2,966	12,555	5,655	503	111	**62,382**
09-ABD (State-funded)	762	44	76	86	NR	NR	**976**
10-Medicare Savings Plan	NR	NR	NR	NR	NR	NR	**NR**
12-Other	121	NR	20	NR	NR	NR	**151**
	274,853	**26,761**	**92,315**	**51,818**	**4,028**	**969**	**450,744**

Notes: *Enrolled in managed care or fee-for-service, excludes prisoners/premium only

** 4/10/2023 represents the end of the Public Health Emergency

***Cells with 10 or fewer individuals have been suppressed (NR)

Table V.0.1b. Members distribution by health plan on July 24, 2023

	O'ahu	**Kaua'i**	**Hawai'i**	**Maui**	**Moloka'i**	**Lāna'i**	**ABD**	**NON-ABD**	**Statewide**
health plan 1	45,798	6,682	15,573	9,737	2,341	511	8,129	72,513	**80,642**
health plan 2	133,454	14,523	55,747	16,433	1,027	232	17,899	203,517	**221,416**
health plan 3	34,596	NR	NR	17,019	NR	NR	4,234	47,381	**51,615**
health plan 4	23,002	2,334	8,542	3,790	367	106	12,542	25,599	**38,141**
health plan 5	37,935	3,209	12,435	4,834	293	120	21,298	37,528	**58,826**
FFS (no health plan)	68	13	18	NR	NR	NR	71	33	**104**
Total	**274,853**	**26,761**	**92,315**	**51,818**	**4,028**	**969**	**64,173**	**386,571**	**450,744**

Note: The State Medicaid population is served by five unique health plans.

Evaluation population

Analyzing the overall health of the Medicaid population during the current waiver demonstration period, the evaluation team utilized an actuarial dataset from 2021 that provided access to member-level risk scores and diagnostic information to conduct a detailed descriptive analysis of the Medicaid population. Administrative eligibility and enrollment demographic information were also utilized. Overall, the Medicaid population in Hawai‘i grew from 365,275 members at the end of 2017 to 455,613 members at the end of 2021 (for any enrollment type). At the end of 2021, 448,326 members were enrolled in a managed care plan. Among these, 411,615 were members for at least 6 months, not dually enrolled (Medicaid & Medicare), or members of Community Care Services, a carve-out, specialized behavioral health plan that includes approximately 5,200 Medicaid members. The following demographic description includes only the 411,615 individuals meeting the latter criteria. The Hawai‘i Medicaid population in 2021 was majority female (51.8% in 2021), with a mean age of 27 years. A breakdown of members' relationship status, ethnic/racial background, and island of residence appear in Table V.0.2.

Table V.0.2. Member Characteristics (2021) among Adult Members for at Least 6 Months, Not Dually Enrolled (Medicaid & Medicare), or Members of Community Care Services

Ethnic and/or Racial Background	N	%
American Indian/Alaskan Native	7,688	1.9
Asian Indian	605	.1
Black	7,053	1.7
Chinese	30,059	7.3
Filipino	60,897	14.8
Guamanian/Chamorro	691	.2
Hawaiian (include part Hawaiian)	57,697	14.0
Japanese	17,697	4.3
Korean	4,762	1.2
Asian not listed	5,819	1.4
Pacific Islander not listed	17,538	4.3
Race/ethnicity not listed	37,197	9.0
Samoan	9,436	2.3
Unknown race/ethnicity	86,400	21.0
Vietnamese	1,915	.5
White	66,161	16.1
Total	**411,615**	**100**

Island of Residence	N	%
O‘ahu	242,983	59.0
Kaua‘i	24,512	6.0
Hawai‘i	81,211	19.7
Maui	48,258	11.7
Moloka‘i	3,638	.9
Lāna‘i	867	.2
Out of State	10,146	2.5
Total	**411,615**	**100**

Overall Demonstration Evaluation

Approach

To better understand the Medicaid population in Hawaiʻi over the initiative period, the evaluation team conducted a longitudinal analysis of Med-QUEST Division (MQD) data from 2017–2022 to understand (1) which chronic and acute conditions were most prevalent among Medicaid members age 18 and above; (2) whether members could be grouped into naturally occurring clusters based on which conditions they received treatment for in the previous year; and (3) if members transitioned from one group or "class" to another over a four year period (2017–2021). We also examined the demographic composition and deaths between 2017–2022 for each group. Finally, we examined whether participation in specific initiatives during this period was associated with transitioning to a new class/group.

Evaluation Methods

Sample

We leveraged a cohort of 217,378 Medicaid members aged 18 and above. Our sample was composed of members enrolled in Medicaid at any point in 2017, with a mean of 10.17 months of enrollment (*SD* = 3.28). We incorporated encounter data extracted from the Hawaiʻi Prepaid Medical Management Information System (HPMMIS) in 2017, 2019, and 2021. We identified a broad range of chronic conditions that were collapsed into 17 specific indicators based on Chronic Disease and Disability Payment System (CDPS) diagnosis related groups. These condition groups served as the primary indicators for classification into latent groups using latent class analysis. The evaluation team then examined changes over time in class membership using latent transition analysis. These indicators were determined by whether an individual received treatment for each chronic condition within each respective year regardless of level of severity. See Table V.0.3 for the 17 conditions and corresponding prevalence rates across years.

Table V.0.3. Rate of Chronic Conditions among Med-QUEST Members in 2017, 2019 & 2021

	2017	2019	2021
Cardiovascular	17%	20%	20%
Psychiatric	13%	16%	16%
Pulmonary	11%	13%	11%
Skeletal	9%	10%	9%
Gastrointestinal	8%	9%	9%
Substance abuse	8%	9%	9%
Diabetes, Type 2	7%	9%	9%

Skin Condition	7%	8%	8%
Metabolic	5%	6%	6%
Eye Disorder	5%	6%	5%
CNS Conditions	4%	4%	4%
Renal	4%	5%	5%
Genital	3%	3%	3%
Infectious	3%	3%	2%
Cancer	2%	2%	2%
Cerebrovascular	1%	1%	1%
Hematological	1%	2%	2%

Note. Conditional formatting (red to green) corresponds to higher to lower values.

Analysis

To uncover groups within the Medicaid population based on members' history of chronic condition treatments and to examine changes in class membership over time, we employed Latent Class Analysis (LCA) and Latent Transition Analysis (LTA) methods. All LCA and LTA models were estimated using the maximum likelihood method with robust standard errors to account for any non-normality in the data. Model fit was assessed using established fit indices, including the Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC), and the Lo-Mendell-Rubin Adjusted Likelihood Ratio Test (LMR-LRT). The optimal number of latent classes was determined based on these fit indices, conceptual interpretability, and the relative size of the classes. Statistical analyses were conducted using M*plus* (version 8.9).

An initial LCA was conducted using 2017 data to identify the number of classes that best fit the data. Additional LCAs were then conducted to verify each year to determine whether the same class profiles could be replicated across years. This process confirmed that a 5-class model best fit the data, with an entropy value of .78. Subsequently, we performed LTA between the years 2017 and 2021 to measure the transition probabilities between these latent classes or health profiles. This analysis provided valuable insights into the dynamic nature of the population's health status, tracking the progression of chronic conditions treatment patterns over time.

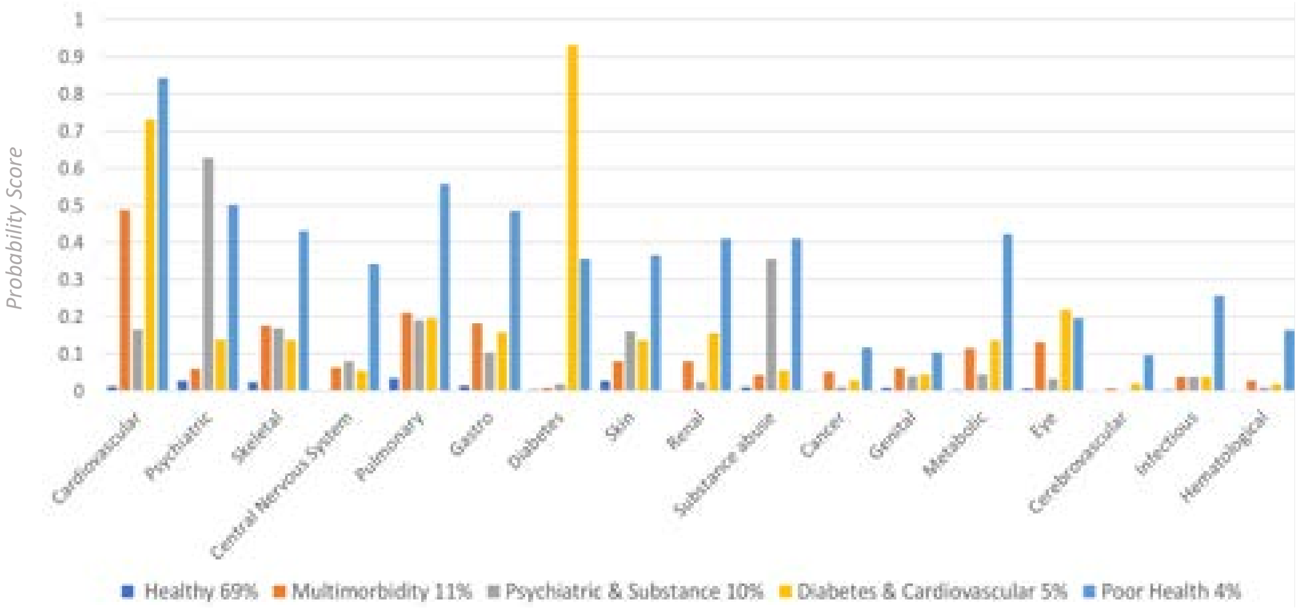
Outputs

These latent classes represent underlying patterns of chronic conditions treatment within the population. The five-class model resulted in the following probabilities of class membership across the 17 chronic conditions (see Figure V.0.1). The classes represent groups of members who exhibited similar chronic condition profiles. Each of the five classes can be summarized as follows:

- The **Healthy Class (HC)** has relatively low utilization of healthcare for all conditions. This class represents the majority of members (69%).

- The **Multimorbidity Class (MMC)** has moderate healthcare utilization for many conditions, including cardiovascular, skeletal, pulmonary, and gastrointestinal, and eye disease, and accounts for 13% of the sample.
- The **Psychiatric & Substance Class (PSC)** members have a high probability of being treated for a psychiatric condition (63%) and a substance abuse condition (36%), and account for 10% of the overall sample.
- Members of the **Diabetes & Cardiovascular Class (DCC)** have a very high probability of being treated for type II diabetes (93%) and cardiovascular disease (73%), and account for 5% of the overall sample. They also have the highest rate of eye disease of any group (22%).
- The **Poor Health Class (PHC)** has the highest rates of almost all conditions (with the exceptions of type II diabetes, psychiatric, substance use and eye disease). Members of this class are in very poor health and accounted for 4% of the sample.

Figure V.0.1. Probabilities of Most Likely Class Membership by Condition, 2017



Examining demographic differences among members, the HC tended to be younger on average (mean age (M), M_{HC} = 34.7 in 2017) compared to all other classes (M_{MMC} = 47.6; M_{PSC} = 39.1; M_{DCC} = 51.8; M_{PHC} = 53.1). While some were statistically different, the HC, MCC, PSC, and DCC all had comparable percentages of males (ranging from 44.8%-46.9%) compared to the PHC (56.1% male). The PHC also had a much higher percentage of members identified as houseless (10.3%), compared to 5.8% for the PSC and .2%-1.0% for HC, MMC, and DCC. Not surprisingly, the PHC also had significantly higher actuarial risk scores (M_{PHC} = 4.57) compared to the HC (M_{HC} = 0.52), MMC (M_{MMC} = 1.47), PSC (M_{PSC} = 1.48), and DCC (M_{DCC} = 1.91).

Table V.0.3a. Between Class Differences, 2017

	Healthy (HC)	Multimorbidity (MMC)	Psychiatric & Substance (PSC)	Diabetes & Cardiovascular (DCC)	Poor Health (PHC)	Average
Age in 2017 (mean)	34.7_{a}	47.6_{b}	39.1_{c}	51.8_{d}	53.1_{e}	38.3
Male (%)	45.8%$_{a}$	44.8%$_{b}$	46.9%$_{c}$	46.5%$_{a, c}$	56.1%$_{d}$	46.2%
Homeless Status (%)*	0.2%$_{a}$	0.6%$_{b}$	5.8%$_{c}$	1.0%$_{d}$	10.3%$_{e}$	1.2%
Risk Score (mean)	0.52_{a}	1.47_{b}	1.48_{b}	1.91_{c}	4.57_{d}	0.96

Note: Values in the same row and not sharing the same subscript are significantly different at p< .05 in the two-sided test of equality for column means. *Homelessness is identified by the presence of specific homeless ICD-10 Z codes in their claim.

Comparing class membership by island (Table V.0.3b) revealed that in 2021:

- O'ahu had a smaller proportion of its members in the PSC (56.7%) but a larger proportion in the DCC (70.7%) when compared to its members' overall proportion of all Medicaid members (60.7%).
- Kaua'i had a larger proportion of its members in the HC (6.2%) and smaller proportion in the PHC (3.9%) and DCC (4.3%) compared to its overall proportion of all Medicaid members (5.9%).
- Hawai'i Island had a larger proportion of its members in the PSC (24.9%) and a smaller proportion of its members in the DCC (15.6%) and PHC (18.4%) compared to its members' proportion of all Medicaid members (20.9%).
- Maui had a larger proportion of its members in the HC (12%) and PSC (11.5%), and smaller proportion of its members in MMC (9.8%), DCC (8.2%), and PHC (8.8%) compared to its members' proportion of all Medicaid members (11.4%).
- Moloka'i had a smaller proportion of its members in PSC (0.7%) and PHC (0.6%) compared to its members' proportion of all Medicaid members (1.0%).
- No significant differences were observed for Lāna'i.

These findings suggest that O'ahu has a disproportionate share of members with type II diabetes and cardiovascular disease, and Hawai'i has a disproportionate share of members with psychiatric and substance abuse conditions. On the other hand, Kaua'i and Maui had a disproportionate share of members in the Healthy Class, with low healthcare utilization across conditions.

Table V.0.3b. Class Membership by Island, 2021

	Healthy Class (HC)		Multimorbidity Class (MMC)		Psychiatric & Substance Class (PSC)		Diabetes & Cardiovascular Class (DCC)		Poor Health Class (PHC)		Total	
Island	n	%	n	%	n	%	n	%	n	%	N	%
O'ahu	90164_{a}	59.8	15276_{b}	62.2	12224_{c}	56.7	8365_{d}	70.7	5896_{e}	68.2	131925	60.7
Hawai'i	31412_{a}	20.8	5198_{a}	21.2	5362_{b}	24.9	1848_{c}	15.6	1588_{d}	18.4	45408	20.9
Maui	18098_{a}	12	2394_{b}	9.8	2471_{a}	11.5	964_{c}	8.2	$758_{b,c}$	8.8	24685	11.4
Kaua'i	9314_{a}	6.2	1402_{b}	5.7	$1318_{a,b}$	6.1	503_{c}	4.3	339_{c}	3.9	12876	5.9
Moloka'i	1521_{a}	1	241_{a}	1	155_{b}	0.7	120_{a}	1	56_{b}	0.6	2093	1
Lāna'i	289_{a}	0.2	42_{a}	0.2	31_{a}	0.1	26_{a}	0.2	6_{a}	0.1	394	0.2

Note: Values in the same row not sharing the same subscript are significantly different at p< .05 in the two-sided test of equality for column proportions.

Notable differences were found across class membership by health plan (see Table V.0.3c). Significant differences included:

- Compared to its members' percentage of all Medicaid members (19.6%), **health plan 1** members were disproportionately likely to be in the HC (20.2%) and less likely to be in the PHC (17.9%).
- Compared to its members' percentage of all Medicaid members (46.7%), **health plan 2** members were disproportionately likely to be in the MMC (50.4%) and much less likely to be placed in the PHC (34%).
- Compared to its members' percentage of all Medicaid members (8.1%), **health plan 3** members were disproportionately more likely to be in the HC (8.9%) and much less likely to be in the PHC (4.4%).
- Compared to its members' percentage of all Medicaid members (12.1%), **health plan 4** members were disproportionately more likely to be in the PSC (15.4%) and *much more likely* to be in the PHC (24.4%).
- Compared to its members' percentage of all Medicaid members (13.4%), **health plan 5** members were disproportionately more likely to be in the DCC (15.2%) and *much more likely* to be in the PHC (19.2%).

These findings suggest that health plan 4 and health plan 5 disproportionately serve members who are in the Poor Health Class and have higher healthcare utilization across all conditions; these health plans also have the highest prevalence of ABD populations (Table V.0.1b). Health plan 1 and health plan 3 disproportionately serve members in the Healthy Class and tend to have lower healthcare utilization across classes. While health plan 2 members are less likely to be in the Poor Health Class, they are disproportionately likely to receive treatment for multimorbidities and psychiatric/substance use disorders.

Table V.0.3c. Class Membership by Plan, 2021

Health plan	Healthy Class (HC)		Multimorbidity Class (MMC)		Psychiatric & Substance Class (PSC)		Diabetes & Cardiovascular Class (DCC)		Poor Health Class (PHC)		Total	
	n	%	n	%	n	%	n	%	n	%	N	%
Health plan 1	30528$_{a}$	20.2	4441$_{b}$	18.1	3910$_{b,c}$	18.1	2286$_{a,c,d}$	19.3	1548$_{b,d}$	17.9	42713	19.6
Health plan 2	70446$_{a}$	46.7	12365$_{b}$	50.4	10649$_{b}$	49.4	5122$_{c}$	43.3	2942$_{d}$	34.0	101524	46.7
Health plan 3	13479$_{a}$	8.9	1568$_{b}$	6.4	1146$_{c}$	5.3	1023$_{a}$	8.7	381$_{d}$	4.4	17597	8.1
Health plan 4	16536$_{a}$	11.0	2845$_{b}$	11.6	3310$_{c}$	15.4	1592$_{d}$	13.5	2112$_{e}$	24.4	26395	12.1
Health plan 5	19809$_{a}$	13.1	3334$_{a}$	13.6	2546$_{b}$	11.8	1803$_{c}$	15.2	1660$_{d}$	19.2	29152	13.4

Note: Values in the same row not sharing the same subscript are significantly different at $p< .05$ in the two-sided test of equality for column proportions.

Statistically significant differences were also found across classes for special population groups (Table V.0.3d). Regarding class differences among special population groups. Most notably:

- Aged, Blind, or Disabled (ABD) members were disproportionately likely to be in the PHC (47.5%) compared to their overall prevalence across the full sample (9%).

- Members associated with Medicaid Expansion were disproportionately less likely to be in the PHC (45.3%) compared to their overall prevalence across the full sample (65.3%).
- Members enrolled as Family & Children (limited to those 18 years and older) were disproportionately more likely to be in the HC (27.1%) and much less likely to be in the PHC (7.2%) compared to their overall prevalence across the full sample (24.1%).

These findings suggest that ABD members are disproportionately likely to have the highest healthcare utilization across all conditions, while members associated with Medicaid Expansion and QUEST were less likely to have high healthcare utilization.

Table V.0.3d. Class Membership by Program, 2021

Program	Healthy Class (HC)		Multimorbidity Class (MMC)		Psychiatric & Substance Class (PSC)		Diabetes & Cardiovascular Class (DCC)		Poor Health Class (PHC)		Total	
Plan	n	%	n	%	n	%	n	%	n	%	N	%
ABD	5792_a	3.8	3624_b	14.8	3502_c	16.2	2524_d	21.3	4108_e	47.5	19550	9.0
Expansion	101008_a	67.0	15823_b	64.4	13936_b	64.6	7301_c	61.7	3913_d	45.3	141981	65.3
Families and Children[1]	40818_a	27.1	4993_b	20.3	3874_c	18.0	1989_c	16.8	619_d	7.2	52293	24.1

Note: Values in the same row not sharing the same subscript are significantly different at p< .05 in the two-sided test of equality for column proportions.

[1] Families and Children represent parents and caretakers of young children and/or pregnant woman; children were not included in these analyses.

Class Transitions

The evaluation team examined transitions from one class to another over time. Table V.0.4 below represents the probabilities of moving between classes, with each row representing class membership in 2017 and each column representing class membership in 2021. Examining latent transition probabilities between 2017–2021, we found that:

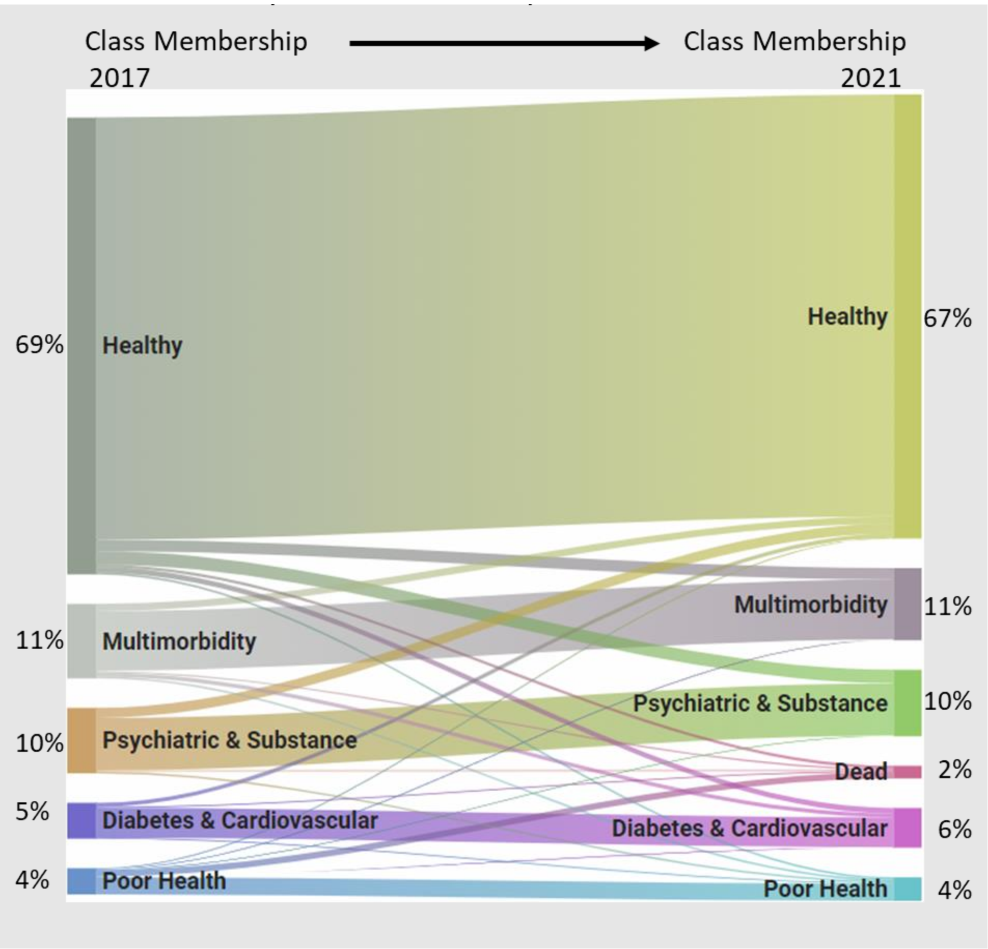
- Members of the HC had the highest probability of staying in their original class (84% remained in HC). However, 7% transitioned to the PSC and 6% to the MMC.
- Members of the MMC had a 12% probability of transitioning to the HC by 2021 and a 6% probability of transitioning to the DCC.
- Members of the PSC had a 21% probability of transitioning to the HC by 2021, which represents the highest probability of transitioning to a new class (excluding members in PHC who died prior to 2021).
- Members of the DCC had a 12% probability of transitioning to the HC but a 5% chance of transitioning to the PHC and a 3% probability of death.
- Members in the PHC in 2017 had a 60% probability of staying in PHC in 2021 and a 23% probability of dying over this period.

Table V.0.4. Probability of Staying or Transitioning into a New Class 2017–2021

		2021 Class					
		Healthy Class (HC)	Multimorbidity Class (MMC)	Psychiatric & Substance Class (PSC)	Diabetes & Cardiovascular Class (DCC)	Poor Health Class (PHC)	Death (As of 2021)
2017 Class	HC	0.84	0.06	0.07	0.02	0.01	0.01
	MMC	0.12	0.77	0.00	0.06	0.04	0.02
	PSC	0.21	0.00	0.74	0.00	0.04	0.01
	DCC	0.12	0.00	0.00	0.81	0.05	0.03
	PHC	0.06	0.05	0.04	0.04	0.60	0.23

These transitions are graphically presented in the following Sankey diagram (Figure V.0.2), which presents the extent of transitioning between classes between 2017 and 2021. Thicker lines represent a larger percentage of the overall sample.

Figure V.0.2. Most Likely Class Membership Transitions 2017–2021



These results suggest that overall, members were likely to remain in the same class in 2021 as they were in 2017. Members with low evidence of utilization (the Healthy Class) in 2017 were most likely to continue experiencing low healthcare utilization in 2021, suggesting that they maintained their health in subsequent years. Those members who received psychiatric and substance abuse treatments in 2017 were most likely to transition to a new class –the Healthy Class– in 2021. Notably, those members in the 2017 Poor Health Class had a high likelihood of having died by 2021.

Death Rates

Because of the number of deaths over the period, the evaluation team examined death rates across the classes. We conducted a Kaplan-Meier method survival analysis to assess the probability of death at each age up to age 65 for the five classes (see Figure V.0.3). The analysis was restricted to members under age 65 in order to focus on early death and limit the potential impact that transition to Medicare after age 65 and/or dual enrollment had on our conclusions. The analysis relied on 2017 classifications and member death status as of 2023.

Between 2017 and 2023, 5,804 members under age 65 died. Of those members who died, 1,476 were members in the HC (1.0% of the HC), 783 were members of the MMC (3.4% of the MMC), 663 were members of PSC (3.1% of the PSC), 547 were members of DCC (5.0% of the DCC), and 2,335 were members of the PHC (roughly 29.9% of the PHC). See Table V.0.5 for the unadjusted death rate by class based on members' classification in 2017. Analyses revealed that the rate of death among members of the PHC was very high for the full and restricted sample (those aged 18–65). These analyses also revealed that those in the MMC, PSC, DCC and PHC had significantly higher rates of death compared to the HC for the full and restricted sample starting in 2019.

Table V.0.5. Unadjusted Rate of Death by Class and Age Group between 2017 and 2023

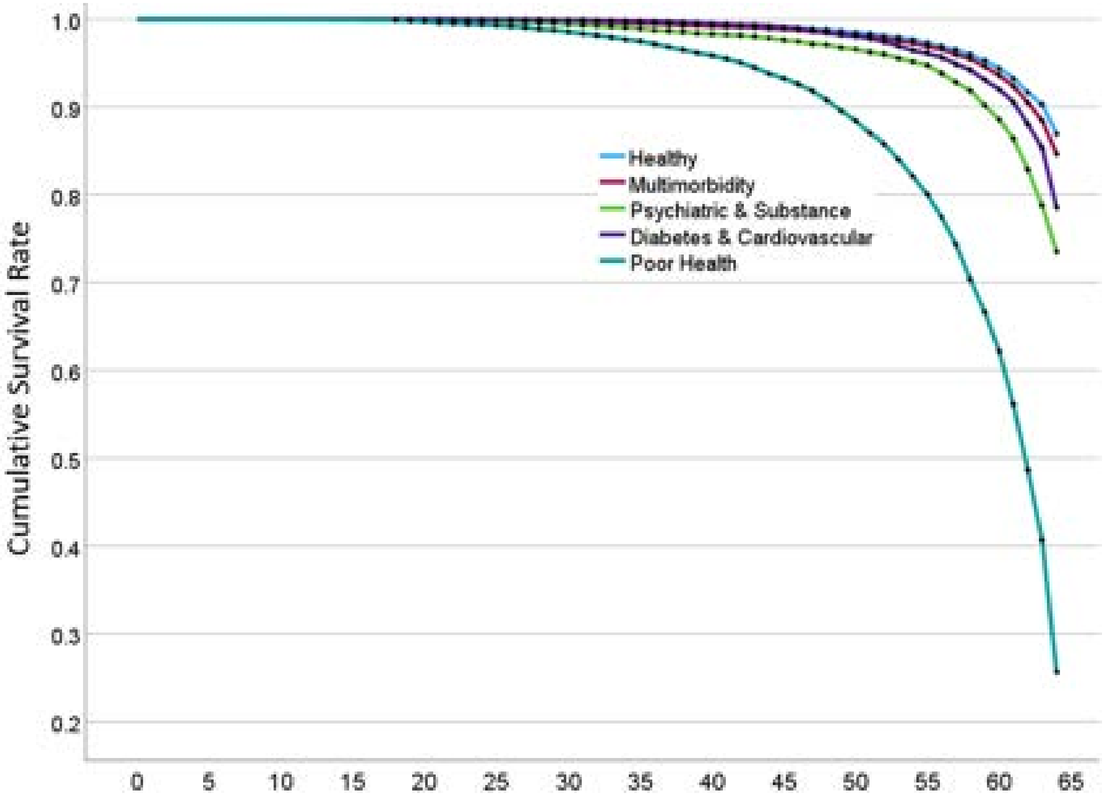
All Members above age 18

	Healthy Class	Multimorbidity Class	Psychiatric & Substance Class	Diabetes & Cardiovascular Class	Poor Health Class	Overall
Died by 2018	0.2% ^{a}	0.5% ^{b}	0.3% ^{c}	0.4% ^{b,c}	8.5% ^{d}	0.6%
Died by 2019	0.3% ^{a}	1.0% ^{b}	0.6% ^{c}	0.9% ^{b}	14.3% ^{d}	1.0%
Died by 2020	0.5% ^{a}	1.5% ^{b}	1.0% ^{c}	1.7% ^{b}	19.3% ^{d}	1.4%
Died by 2021	0.6% ^{a}	2.0% ^{b}	1.5% ^{c}	2.5% ^{d}	24.6% ^{e}	1.9%
Died by 2022	0.8% ^{a}	2.8% ^{b}	2.4% ^{c}	3.8% ^{d}	28.2% ^{e}	2.4%
Died by 2023	0.011 ^{a}	3.7% ^{b}	3.1% ^{c}	5.6% ^{d}	32.3% ^{d}	3.1%
	Members between the Ages of 18-65 Only					
Died by 2018	0.2% ^{a}	0.5% ^{b}	0.2% ^{a,c}	0.3% ^{b,c}	7.6% ^{d}	0.5%
Died by 2019	0.3% ^{a}	0.9% ^{b}	0.6% ^{c}	0.8% ^{b,c}	13.0% ^{d}	0.9%
Died by 2020	0.4% ^{a}	1.3% ^{b}	1.0% ^{c}	1.5% ^{b}	17.6% ^{d}	1.3%
Died by 2021	0.6% ^{a}	1.8% ^{b}	1.4% ^{c}	2.2% ^{b}	22.5% ^{d}	1.7%
Died by 2022	0.7% ^{a}	2.6% ^{b}	2.3% ^{b}	3.3% ^{c}	26.0% ^{d}	2.2%
Died by 2023	1.0% ^{a}	3.4% ^{b}	3.1% ^{b}	5.0% ^{c}	29.9% ^{d}	2.7%

Note: Values in the same row and not sharing the same subscript are significantly different at $p< .05$ in the two-sided test of equality for column means.

As presented in Figure V.0.3, the probability of early death among members of the PHC class is greater across all ages, with a gap that becomes considerably greater by age 50. This trend continues with growing gaps in probability of death between the PSC (second highest probability) and the DCC (third highest probability) by age 60.

Figure V.0.3. Kaplan-Meier Survival Functions by Class to Age 65



Predictors of Death

Finally, to further determine the extent that class membership in 2017 predicted death above and beyond demographic characteristics and actuarial risk scores, we conducted a logistic regression analysis, with demographic predictors entered in Step 1, class membership (HC as the reference group) in Step 2, and actuarial risk scores entered in Step 3 (Table V.0.7).

Table V.0.7. Logistic Regression Predicting Death by Year 2023

	Step 1 (Nagelkerke Pseudo R^2 = .15)							
	B	S.E.	Wald	df	Sig.	OR	95% C.I. for OR LL	 UL
Age in 2017	0.07	0.00	4866.56	1.00	<.001	1.07	1.07	1.08
Male in 2017	0.68	0.03	521.26	1.00	<.001	1.97	1.86	2.09
Homeless status in 2017	1.39	0.06	497.97	1.00	<.001	4.02	3.56	4.54
Constant	-7.40	0.06	15301.10	1.00	<.001	0.00		
	Step 2 (Nagelkerke Pseudo R^2 = .28)							
Age in 2017	0.05	0.00	1705.95	1.00	<.001	1.05	1.05	1.05
Male in 2017	0.64	0.03	419.77	1.00	<.001	1.89	1.78	2.01
Homeless status in 2017	0.18	0.07	6.90	1.00	0.009	1.20	1.05	1.37
Healthy Class			6639.96	4.00	<.001			

Multimorbidity Class	0.67	0.05	180.35	1.00	<.001	1.96	1.78	2.16
Psychiatric & Substance Class	0.90	0.05	278.05	1.00	<.001	2.46	2.21	2.73
Diabetes & Cardiovascular Class	0.82	0.06	199.63	1.00	<.001	2.28	2.04	2.56
Poor Health Class	3.07	0.04	5573.24	1.00	<.001	21.59	19.92	23.40
Constant	-7.14	0.06	12093.32	1.00	<.001	0.00		
	Step 3 (Nagelkerke Pseudo R^2 = .29)							
Age in 2017	0.05	0.00	1741.28	1.00	<.001	1.05	1.05	1.05
Male in 2017	0.65	0.03	427.29	1.00	<.001	1.92	1.81	2.05
Homeless status in 2017	0.05	0.07	0.57	1.00	0.451	1.05	0.92	1.21
Healthy Class			2247.04	4.00	<.001			
Multimorbidity Class	0.47	0.05	85.78	1.00	<.001	1.60	1.45	1.77
Psychiatric & Substance Class	0.72	0.05	173.41	1.00	<.001	2.05	1.84	2.28
Diabetes & Cardiovascular Class	0.53	0.06	77.34	1.00	<.001	1.69	1.51	1.91
Poor Health Class	2.30	0.05	1933.54	1.00	<.001	9.97	9.00	11.05
Risk Score in 2017	0.18	0.01	640.17	1.00	<.001	1.20	1.18	1.21

Results from this analysis determined that:

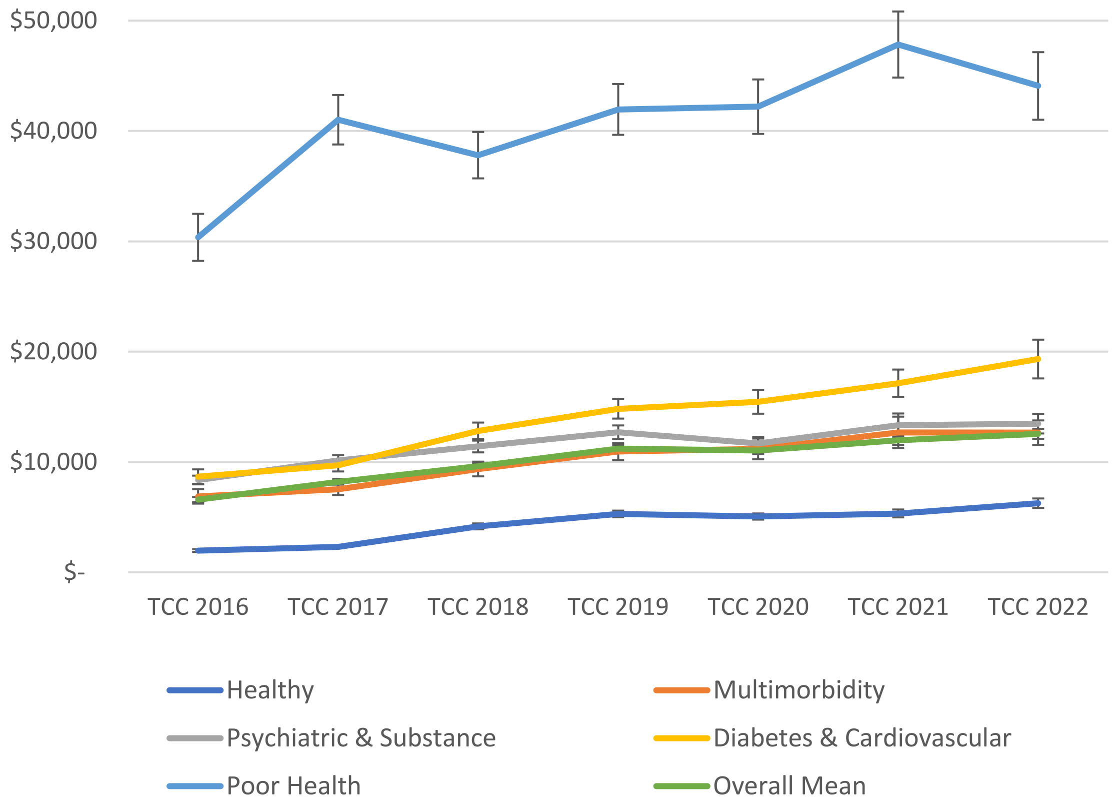
- Age in 2017, identifying as male, and being flagged as experiencing homelessness in 2017 were strong predictors of having died by 2022. Age, if exponentiated to represent a ten-year increase (versus 1 year [unit] increase), results in an odds ratio (OR) of 2.05 in step 1, 1.65 in step 2, and 1.67 in step three. This finding suggests that after accounting for class membership and actuarial risk scores, for every ten-year increase in age, the odds of dying increases by 67%.
- Membership in any class compared to the HC in 2017 was a very strong predictor of death by 2022. Being a member of the MMC, PSC, DCC, and PHC all resulted in OR at or over 2, with being a member of the PHC resulting in very high odds of death compared to the HC (OR = 21.59 in step 2 and 9.97 in step 3).
- The actuarial risk score (*M* = 0.96 ; *SD* = 1.25) was added in the final step to determine whether class membership was predictive of death, above and beyond age, identifying as male, and homelessness status, as well their risk score. The addition of the risk scores in the third step of the analysis resulted in negligible added effect (Δ = Nagelkerke Pseudo R^2 = .014).

Thus, this final step in the analysis suggests that being placed in any class other than the Healthy Class in 2017 resulted in increased odds for death by 2022, with 2017 membership in the PSC (OR = 2.05) and the PHC (OR 9.97) being highly predictive of death.

Total Cost of Care

The evaluation team examined the total cost of care from 2016 to 2022 across classes. The mean total cost of care for an adult Medicaid member who received care in 2016 was $6,586. This amount rose to $12,548 by 2022. While a meaningful increase occurred overall, particularly sizable increases were observed among members in the PHC and the DCC (Figure V1.0.4). The PHC had the highest total cost of care across all years. Overall, the trend of costs increased fairly dramatically between 2016–2019 (overall increase by 70%). Increases between 2019–2022 were notably less (overall increase by 12%). While this finding is promising, its interpretation is complicated by the onset of the COVID-19 pandemic, which may have limited access or led to deferred care in some cases, while increasing the need for care for others. When examined closely by class membership, it is clear that as a percentage, the HC class increased the most between 2016–2019 (a 169% increase) but exhibited fairly modest growth between 2019–2022. This can be contrasted to the DCC, which exhibited fairly high growth between 2016–2019 (70%), but still had notable growth between 2019–2022 (30%). Trends between 2016 to 2019 and 2019 to 2022 suggest that all classes reported slower growth in costs between 2019–2022 compared to 2016–2022. Changes in growth were within the margin of error in 2019–2022 for the PHC and PSC, and increased only modestly for the HC and MCC. One could speculate that those in the Healthy Class were more likely to defer non-urgent care, while those in the DCC were more susceptible to complications associated with acquiring COVID-19 and/or had medical treatments that could not be deferred.

Figure V.0.4. Total Cost of Care by Class 2016–2022



Note: Total Cost of Care = TCC

Conclusions

The PHC had the highest probability of death and the highest cost of care compared to all groups. They also experienced an increase in the cost of care between 2016 and 2022. Members in this class in 2017 tended to stay in this class in 2021. Notably, membership in the PHC predicted early death above and beyond age, risk scores, and other characteristics. PSC membership was also highly predictive of death; however, membership in this class in 2017 had the highest probability of transitioning to the Healthy Class by 2021. This finding suggests an opportunity for reducing costs and increasing health outcomes for members in this class through robust substance use prevention and treatment programs. Moreover, programs that prevent individuals from falling into or remaining in this class could be particularly beneficial, with previous data demonstrating that it is possible. Related, it also appears that members of the DCC were associated with a steep incline in total cost of care compared to the MMC, PSC, as well as the overall mean. This suggests that the treatment costs for members of this class are outpacing treatment costs in other areas. This finding offers opportunities to closely examine the costs of care for these individuals and emphasizes the need to prioritize prevention services to limit the number of people who fall into this class and tertiary services to limit the probability that they transition to the PHC Finally, the rate of expenditure growth slowed when comparing the prior demonstration period (2016–2019) to the current demonstration period (2019–2022) for most groups; however, these findings may have been confounded by the COVID-19 pandemic and thus need to be interpreted with caution.

Project 1A: Assessing Utilization, Spending, and Quality of Primary Care and its Association with Health Outcomes

Introduction and Background

The hypothesis explored in this chapter is: “Increasing utilization for primary care, preventive services, and health promotion will reduce prevalence of risk factors for chronic illnesses and lower the total cost of care for targeted beneficiaries.”

The two primary research questions explored in this chapter include:

RQ 1A.1: What are time trends in utilization, spending (as a percentage of total spending), and quality of primary care for demonstration populations?
RQ 1A.2: Are changes in primary care utilization associated with plausibly relevant health outcomes?

Primary care has many definitions and component concepts. During its 1979 meeting, the World Health Assembly defined primary health care as services that promote a level of health that permits citizens to lead a socially and economically productive life (Starfield, 1998). This definition of primary care included “essential health care…at a cost that the community and the country [could] afford to maintain at every stage of their development in a spirit of self-reliance and self-determination” (Starfield, 1998). Primary care can also be described in the context of four pillars of primary care practice including: first-contact care, continuity of care over time, comprehensiveness or concern for the entire patient rather than one system, and coordination with other parts of the health system (Bodenheimer & Pham, 2010). Primary care centers on a patient-centered culture that places the needs of patients above all else, and care that is regularly measured to ensure high quality (Bodenheimer & Pham, 2010). These definitions speak to a vision of primary care as a service area critical to the well-being of a society and its constituents.

In the US, primary care responsibilities are shared by many categories of practitioners, including family physicians, geriatricians, general pediatricians, nurse practitioners, and physician assistants (Bodenheimer & Pham, 2010). The prevailing approach to healthcare stresses a sustained relationship between patients and their clinicians, and its definitions generally encompass the need for accessibility, continuity, integration, and a whole-person orientation of care (Safran, 2003). Primary care generally includes a focus on health promotion, health maintenance, disease prevention, counseling, patient education and literacy, and diagnosis and treatment of chronic and acute illnesses (Stanborough, 2020).

Investments in primary care result in improvements to equity and access, health care performance, health outcomes, accountability of health systems, and are seen as the most equitable, inclusive, and cost-effective approach to enhance the health of people (WHO, 2021; Starfield et al., 2005). Research indicates that continued availability of Primary Care Providers (PCP) is associated with improved overall health outcomes, observable in results including reduced low birth weight, reduced mortality rates, decreased hospitalizations, and increased self-rated health status (Shi, 2012).

Primary Care Measurement Across Other States

While substantial research has documented the benefits of primary care, and the importance of investing in primary care, the conceptualization of primary care in the US is best characterized as an emerging discourse.

The Patient-Centered Primary Care Collaborative (PCPCC) authored a report titled *Investing in Primary Care: A State-Level Analysis* to aid state-level and national policy leaders by providing quantitative data and analysis of primary care spending at the state level. This report also describes the association between primary care and patient outcomes in order to measure and increase the investment in primary care. In it, primary care is measured using two definitions. A narrow definition of primary care includes spending related to PCPs in offices and outpatient settings, while a broad definition also covers spending upon other members of the primary care clinical team, including nurses, nurse practitioners (NPs), physician assistants (PAs), OB/GYNs, and behavioral health professionals (i.e., psychiatrists, psychologists, and social workers) (PCPCC, 2019). Healthcare expenditures included outpatient, office-based, hospitalizations, emergency department, prescription medications, vision care, dental care, home health care, and other medical categories.

The Primary Care Collaborative found that in 2019, primary care spending across commercial payers was only 4.67% of total national commercial healthcare spending, a fall from 4.88% in 2017. From 2017–2019, primary care spending under the narrow definition of PCPs and primary care services varied from as low as 3.14% in Kentucky to as high as 9.48% in Michigan; using the broad definition, from a low of 5.57% in Pennsylvania to a high of 16.64% in Mississippi (Kempski & Greiner, 2020). Within this report, Hawaiʻi ranked 31st in the nation with 4.34% on primary care utilizing the narrow definition and 36th with 7.58% of total primary care spend utilizing the broad definition (Kempski & Greiner, 2020). Additionally, Hawaiʻi ranked 49th (-1.26) on percent change in primary care spending using the narrow definition and 47th (-1.29) on percent change in primary care spending using the broad definition (Kempski & Greiner, 2020). A negative association was found between the measure of primary care spending percentage and measures of utilization including ED visits and hospitalizations, thus indicating targeted strategies to invest in primary care capacity can improve patient outcomes and the appropriate use of health system resources (Kempski & Greiner, 2020).

Both definitions of primary care in the PCPCC report measured primary care spend in terms of the quantity of clinician-patient interactions; neither attempted to assess the quality or richness of preventative care received by patients as a result of their engagement with their primary care providers.

Primary Care Measurement in Hawaiʻi

As Hawaiʻi embarked upon its own 1115 waiver demonstration, its first task was to define primary care investment. Similar to the PCPCC report, a review of definitions applied by other states principally leaned towards methodologies that emphasized primary care visits and overall engagement with primary care providers. Despite parallels in some definitions of primary care spend (e.g., costs of vaccinations, screenings), no comprehensive definition of primary care services was found in use by any state. Hawaiʻi also recognized that for members with more complex health conditions (e.g., comorbid behavioral health conditions) the provision of primary care alone may not be adequate to prevent avoidable service utilization. These patients likely need additional outpatient supports in conjunction with primary care, such as care coordination, psychotherapy, and other services, to be sufficiently supported in the outpatient setting and avoid a deterioration in their health outcomes. Finally, Hawaiʻi also recognized that even in the primary care setting, certain services are well-documented to provide no perceptible positive impact on health outcomes, making them unnecessary and wasteful services that ought not to be promoted. Given these considerations, Hawaiʻi came up with a more comprehensive definition of primary care services and spend for its 1115 waiver demonstration including four distinct metrics: spend on primary care visits, spend on beneficial primary care services, spend on primary care supports, and spend on low-value care. The first three metrics were mutually exclusive in definitions and in combination, added up to Hawaiʻi's total primary care spend, while the individual definitions would allow separate evaluation of each of the distinct domains of primary care.

Based on the definitions, Hawaiʻi created a new managed care report during the current 1115 waiver demonstration period, the *Primary Care Report*. The purpose of this report was to track progress towards a health plan's investments in primary care using each definition of primary care spend. Its purpose was to establish baseline spending on primary care based on each definition; then, a health plan could set a series of achievable targets to iteratively decrease its spending on low-value care and increase spending on beneficial services, with proven patient and monetary benefits. The report was created in 2020, and introduced to Hawaiʻi's health plans in 2021. The state provided substantial technical assistance and support to its health plans to promote accurate reporting on the metrics contained within the report. The first accurate reports of primary care spend for calendar years 2020 and 2021 were submitted by health plans at the beginning of 2023. At the time of authorship of this evaluation report, Med-QUEST Division has not set targets for primary care spending across any of the definitions.

The definitions of primary care spend included in the *Primary Care Report* are:

1. Primary care visits, which are the setting for preventive care provided by PCPs, often serving as the first point of care for an individual. An office consult of a specified duration (e.g., 30 minutes) is a characteristic service under this definition. Increasing spend on primary care visits can indicate greater utilization of primary care providers, and/or higher rates of reimbursement for primary care visits; both result in an increase in access to primary care.
2. Beneficial primary care services concern services provided, or, in some cases, recommended in the outpatient primary care setting. This definition emphasizes the preventative services provided during and as a result of an outpatient visit. Beneficial primary care services are defined as preventive care with a focus on high value care services such as screenings, assessments, and immunizations provided or referred in the primary care setting.
3. Primary care supports, defined broadly as the set of care services that engage, support, stabilize, and improve management of the member in the outpatient setting, so as to reduce excessive and inappropriate inpatient utilization. Examples include care coordination and behavioral health supports.
4. Low-value primary care services, defined as services that are typically provided in primary care settings but considered unnecessary and known to result in wasteful spending. Services include for instance prescription of antibiotics in case of ear infections and injections for low back pain (Ganguli et al 2021).

The 2019–2023 1115 waiver evaluation design hypothesized that the activities conducted during the MQD 1115 waiver, would increase utilization of, spending on, and quality of primary care services, preventive services, and health promotion services, which in turn would improve measures of relevant health outcomes.

Anticipated Relationships Between Cost, Utilization, and Outcomes

Hawaiʻi has consistently maintained a PCP-Enhancement (PCP-E) program during the period from 2013-present, through which primary care providers have been paid at levels equivalent to Medicare rates for primary care practice. Therefore, increases in Medicare rates have been closely mirrored by increases in

Medicaid rates for Hawaiʻi's PCPs (following some lag). This program, administrated as a directed payment arrangement, is most likely to impact the first definition, primary care visits, as it is focused on expenditures connected directly to provider visits. To account for potential confounding due to PCP-E, this evaluation looks at both spend and utilization to assess whether an increase in spend led to corresponding increases in utilization.

In normal times, a theory of prevention benefits of primary care would have predicted that an increase in utilization would lead to improved quality outcomes over time because of the preventative benefits of primary care and the capacities of primary care to provide anticipatory care. The mechanism by which primary care works is through anticipating care and preventing problems before they occur (Watt, O'Donnell and Sridharan, 2011). Given the disruptions caused by the COVID-19 pandemic, the relationship between utilization and quality outcomes may not be strong for multiple reasons:

- Shutdowns caused by the pandemic made for unusually sporadic access to primary care and reduced utilization of primary care services.
- The pandemic also resulted in the changes in the modalities of care. There was an increased focus on contactless modalities like telehealth. It is unclear whether these alternate modalities are as effective as in-person services.
- Individuals delayed care during the COVID-19 pandemic (Findling et al., 2020; Gertz et al., 2022).

For these reasons, the evaluation team adjusted expectations to anticipate a weakened relationship between utilization and outcomes in primary care.

Evaluation Approach

Evaluation Questions

The original evaluation design included several proposed evaluation questions. However, for reasons we will outline below, the research questions for Project 1A. Primary Care listed in Table V1.A.1. have been revised for the current report.

Table V1.A.1. Primary Care Original Research Questions

RQ 1A.1: What are time trends in utilization, spending (as a percentage of total spending), and quality of primary care for demonstration populations?
RQ 1A.2: Are changes in primary care utilization associated with plausibly relevant health outcomes?

The research questions posed in the original design were aimed first at evaluating time trends in utilization, spending, and quality of care. HEDIS quality outcome data was available for two consecutive years only, i.e., 2020 and 2021. The limited availability of outcome data across multiple years necessitated the adjustment of RQ 1A.1 to exclude time trends for quality of primary care provided to demonstration populations.

Moreover, the observations of research question one indicated a decrease in utilization and spending rather than the intended increase. As per the proposed design, this observed decrease would eliminate the need to evaluate RQ1A.2. The hypothesis that demonstration efforts would result in expected positive changes in primary care use and spending and further lead to associated improvements in health outcomes was consequently invalid. Nevertheless, the evaluation team opted to evaluate the link between primary care use and selected health care outcomes cross-sectionally to provide an indication of potential for improvement in future years.

While the propensity score matching was proposed to assess the association of primary care utilization and plausibly relevant health outcomes, the evaluation team opted not to apply the method after taking the sample size into consideration. The selected relevant health outcomes were limited in particular subpopulations (for example, members with diabetes), resulting in small sample sizes for the analyses. Propensity score matching process would unavoidably reduce the sample size further. Moreover, previous studies have concluded that propensity score matching methods are not necessarily superior compared to traditional methods with covariate adjustment (Brazauskas & Logan, 2016; Elze et al., 2017). Therefore, the evaluation team decided to conduct multivariate regression with controlling proper covariates (i.e., CDPS risk score).

Table V1.A.2 Primary Care Amended Research Questions

RQ 1A.1: What are time trends in utilization and spending (as a percentage of total spending for Demonstration populations?
RQ 1A.2: Is Primary care utilization associated with plausibly relevant health outcomes?

Various methods were used to explore the two primary research questions. Changes in spending were explored using descriptive statistical approaches and multivariate statistical methods were implemented to explore the relationship between utilization and outcomes.

RQ 1A.1: What are time trends in utilization, spending (as a percentage of total spending), and quality of primary care for Demonstration populations?

Due to Hawaiʻi's unique approach to defining primary care spending as high- and low-value care, it is expected that proportional spending on (high-value) primary care per member per month will increase over time as waste is reduced and more expensive specialist care is prevented.

Spending on Primary Care Services

We operationalized spending in three ways: total spend on primary care for the full Medicaid population, proportional spend (as a percentage of total spend), and spend per member per month. Spend and utilization metrics were calculated for the various definitions of primary care: (1) primary care visits; 2) beneficial primary care services; 3) primary care supports; and 4) low-value primary care services. Historic encounter data was used to calculate all metrics besides low-value primary care services, which was evaluated based on health plan reported data.

- Total spend for the Medicaid population
    - Presented for the years 2016–2022 for (1) primary care visits; (2) beneficial primary care services; and (3) primary care supports (Source: MQD Encounter Data)
    - Presented for the years 2020–2021 for (4) low-value primary care services (Source: MQD health plan Reports)
- Average spend per member per month (PMPM)
    - Presented for the years 2016–2022-for (1) primary care visits; (2) beneficial primary care services; and (3) primary care supports (Source: MQD Encounter Data)
    - Presented for the years 2020–2021 for (4) low-value primary care services (Source: MQD health plan Reports)
    - Spend was adjusted for inflation using the Consumer Price Index (CPI) to represent 2022 dollars. An inflation adjustment is standard for any cost comparison over time. Any changes in inflation need to be accounted to look at differences in 'real costs' between years. From 2016–2022, inflation was around 20%.
- Proportional spend (primary care spend as a proportion of total spend)
    - Presented for the years 2020–2021 for (1) primary care visits; (2) beneficial primary care services; (3) primary care supports; (4) primary care low-value services; (Source: Med-QUEST health plan Reports)

To provide information on differences between ABD, Family & Children, and expansion populations, we additionally derived information from health plan reports on costs per eligibility group in 2020 and 2021.

Utilization of Primary Care Services

We operationalized utilization as total number of primary care claims for the Medicaid population and average number of claims PMPM.

Comparison Between Utilization and Spend

Additionally, we evaluated the relationship between spend and utilization to assess for trends in spend that were not explained by trends in utilization. For this purpose, we calculated the mean spend per claim for the first three primary care definitions.

Analyses of RQ1

Changes to primary care spending and utilization over time were provided from 2016–2022 to represent changes over time from 3 years prior to the demonstration (2016–2018), and 4 years within the current demonstration period (2019–2022).

Differences in spend between the start of the demonstration period (2019), and the latest available complete year of data during the demonstration period (2022) were calculated using t-statistics.

RQ 1A.2: Is Primary Care Utilization Associated with Plausibly Relevant Health Outcomes?

For the purpose of investigating if primary care utilization is associated with plausibly relevant health outcomes, we tested whether any use of (1) primary care visits, (2) beneficial primary care services, and 3) primary care supports in 2021 was associated with multiple health care outcomes in 2021.

Association between Primary Care Utilization and Health Outcomes

Data Sources

This section of evaluation obtained data from three sources, including the encounter data from MQD's HPMMIS system, the Healthcare Effectiveness Data and Information Set (HEDIS) Patient-Level Data (PLD) from 2021, and the Chronic Illness and Disability Payment System (CDPS) risk score data from 2021 provided by MQD's actuaries.

Measures

Independent variable
Primary care utilization was analyzed as a binary variable and obtained from the encounter data from MQD's HPMMIS system for each primary care definition: (1) primary care visits, (2) beneficial primary care services, and (3) primary care supports. Members were categorized into two groups: "no primary care claim in 2021" and "had at least one primary care claim in 2021".

Outcome variables

Outcome variables were selected for their relevance and link to Hawai'i's quality strategy (diabetes and behavioral health) (MQD, 2020) and the widely hypothesized effect of primary care services on outcome measures of ED visits (Cornell, Halliday & Ader, 2020), inpatient visits, and inpatient length of stay (Shi, 2012).

All outcome variables were obtained from the encounter data extracted from MQD's HPMMIS system and quality measures from the HEDIS PLD 2021. Outcome variables included the PMPM counts of ED visits, inpatient visits, and inpatient length of stay in 2021 for members. In addition, the relationship between diabetes and behavioral health and primary care utilization, with different scopes of service under different definitions was investigated.

a. Comprehensive diabetes care (CDC) among members with diabetes, including:
    - HbA1c control (<8.0%)
    - HbA1c poor control (>9.0%)
    - Blood pressure control (<140/90 mm Hg)

b. Follow-up of ED visits or hospitalization for behavioral health
    - Follow-up within 30 days of ED visit for substance use
    - Follow-up within 30 days post-discharge from hospitalization for mental illness
    - Follow-up within 30 days of ED visit for mental illness

Covariates

Covariates included age, sex, race/ethnicity, island, and risk score in 2021:

- Age was categorized into five groups: under 18 years old, 19–44 years old, 45–64 years old, 65–84 years old, 85 years and older.
- Sex (0=male, 1=female) was analyzed as a binary variable.
- Race/ethnicity was categorized into six groups: non-Hispanic White, American Indian/Alaska Native, Asian, non-Hispanic Black, Filipino, other Pacific Islanders, Native Hawaiian (including part Hawaiian), and other or unknown or unspecified.
- Six groups for island of residence were identified: Oʻahu, Kauaʻi, Hawaiʻi, Maui, Molokaʻi, and Lānaʻi.
- Actuarial risk scores (prospective CDPS risk scores) calculated based on measurement year 2021 were included as an indicator of health status in 2021.

Analyses of RQ2

Multivariate linear regression was conducted to detect any significant differences between primary care utilization and health outcomes. Members with missing data in any of the independent or dependent variables and covariates were excluded from analyses. Linearity between variables, absence of multicollinearity, independence of residuals, constant variance of residuals, normal distribution of residuals, and presence of outliers was checked. The adjusted R2 was calculated to evaluate the model fit.

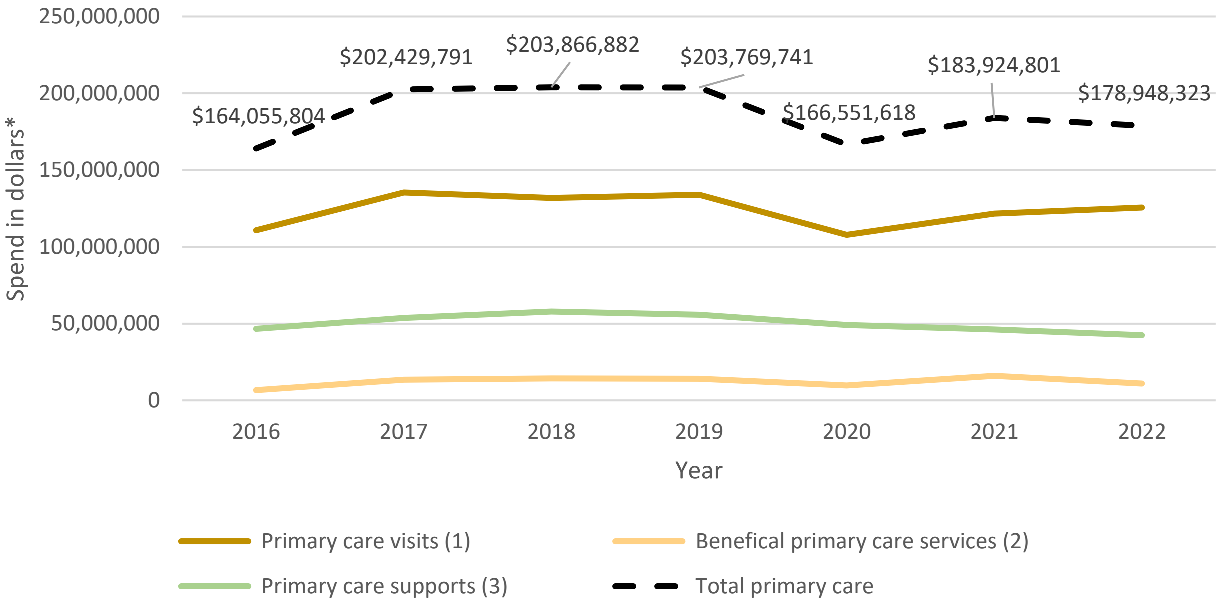
Results

Spending on Primary Care

Figure V.1A.1 demonstrates changes over time for spending on primary care and subdivided to the primary healthcare definitions (1) primary care visits, (2) beneficial primary care services, and (3) primary care supports. As indicated by the graph, an overall increase in primary care spending on all definitions is shown between 2016 and 2018. A dip in overall primary care spending (in line with a dip in spending on primary care visits) is noticeable in 2020, specifically for spending on primary care visits, with a slight recovery in 2021.

The graph indicates spending has not recovered to 2018 levels; overall primary care spending reached $178,948,323 for 2022, which is less than the inflation-adjusted spending of $203,866,882 in 2018, the highest observed yearly total.

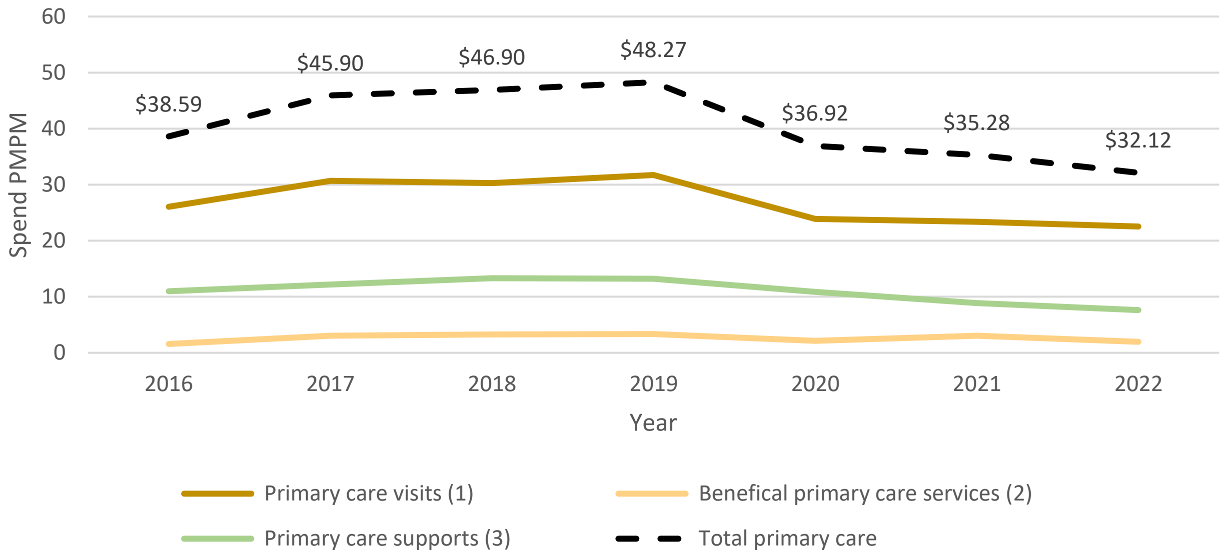
Figure V.1A.1. Total Amounts of Primary Care Spend in Dollars, by Primary Care Procedure Definition 2016–2022



Note: Costs were inflation adjusted to represent 2022 dollars

Figure V.1A.2 demonstrates primary care spending per member per month (PMPM) for the Medicaid population. PMPM total primary care spending declined since 2019. A decrease in Primary care visits (definition 1) is visible in line with the decrease in overall spending. Beneficial primary care services (definition 2) show an initial light rise in spending until 2021, reaching $3.06 PMPM in 2021, to then decrease to $1.97 in 2022. Primary care supports (definition 3) has declined since 2018 from $13.30 PMPM to $7.62 PMPM in 2022.

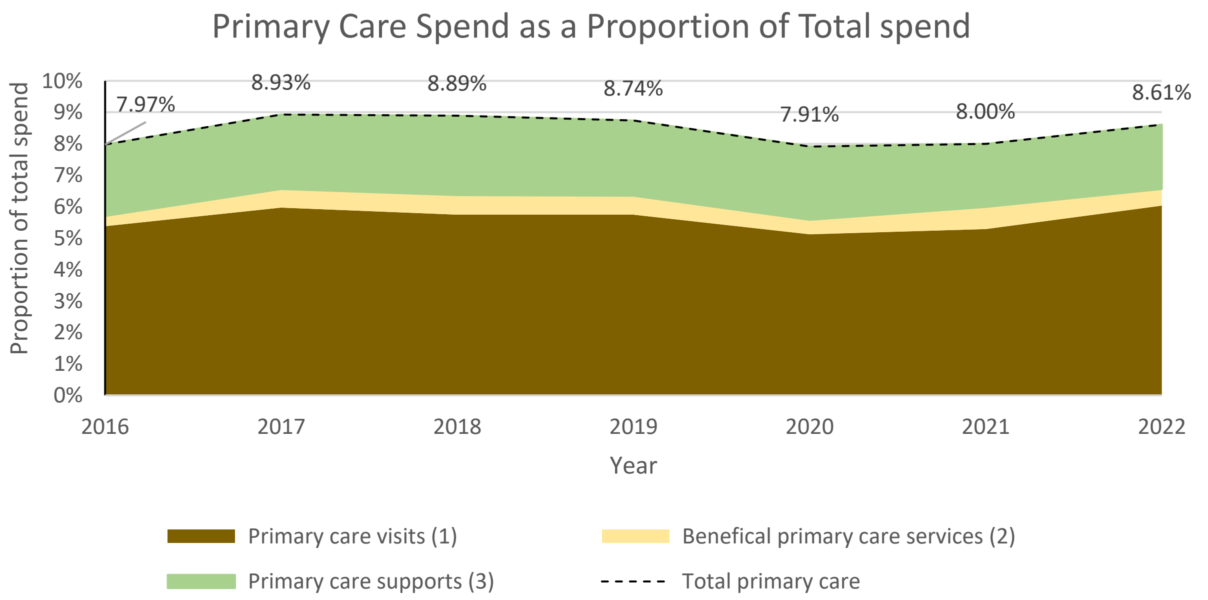
Figure V.1A.2. Primary Care spend PMPM, by Primary Care Procedure Definition 2016–2022



Note: Costs were inflation adjusted to represent 2022 dollars

Figure V.1A.3 demonstrates proportional spend (primary care spend as a proportion of total spend) for the three definitions. The graph indicates that proportional spend on primary care has remained relatively stable from 2016–2022, with primary care spend consisting of 8.93% of the total spend in 2018 and 8.61% of the total spend in 2022. Proportional spend on primary care dipped in 2020 to 7.91% of total spend.

Figure V.1A.3. Primary Care Spend as a Proportion of Total Spend 2016–2022



Analyses of mean differences in spending

Since the start of the demonstration period, total spend on primary care decreased significantly from *$*48.30 PMPM in 2019 to *$*32.10 PMPM in 2022. Spend on primary care visits has decreased by 29%, beneficial primary care services by 41%, and primary care supports by 42%. Table V.1A.1a displays the differences in mean PMPM spend.

Table V.1A.3a. Difference in Mean PMPM Spending on Primary Care, 2019–2022

	2019			2022			Trend		
	Number of eligible member-months	Spend	Mean PMPM*	Number of eligible member-months	Spend	Mean PMPM	Difference in mean PMPM 2019/2022	95%CI	*p*-value
Primary Care Visit (1))	4,221,153	$ 133,897,779	$31.70	5,571,323	$ 125,517,947	$22.50	-29.0%	8.93 - 9.45	<.001
Beneficial Primary Care Services (2)	4,221,153	$ 14,122,278	$3.30	5,571,323	$ 10,989,761	$2.00	-41.0%	1.31 - 1.43	<.001
Primary Care Supports (3)	4,221,153	$ 55,749,683	$13.20	5,571,323	$ 42,440,615	$7.60	-42.3%	5.29 - 5.89	<.001
Primary Care (Total)	4,221,153	$ 203,769,741	$48.30	5,571,323	$ 178,948,323	$32.10	-33.5%	15.71 - 16.60	<.001

Note: Costs were inflation adjusted to represent 2022 dollars.

Based on reports submitted by health plans, spend on low-value primary care services reportedly fell 32.7% from $3.11 PMPM in 2020 to $2.09 PMPM in 2021. Spending on low-value care services was $14,008,558 in 2020, and $10,890,093 in 2021. Differences between eligibility groups exist in the change between 2020 and 2021, with the ABD Non-Dual eligibility group demonstrating a strong increase in spending by 146% on low-value services specifically (Table V.1A.3a and 3b).

Table V.1A.3b. Difference in Mean PMPM Spending on Low-Value Primary Care, 2020–2021

	2020			2021			Trend
	Number of eligible member-months	Spend	Mean PMPM*	Number of eligible member-months	Spend	Mean PMPM	Difference in mean PMPM 2020/2021
Family & Children	2,291,683	$7,472,810.59	$3.26	2,436,938	$ 4,141,853.27	$ 1.70	-47.9%
Expansion	1,616,887	$4,882,442.08	$3.02	1,979,784	$ 3,373,939.52	$ 1.70	-43.6%
ABD Non Dual	256,798	$1,237,257.94	$4.82	244,491	$ 2,898,966.90	$ 11.86	146.1%
ABD Dual	454,005	$416,046.98	$0.92	483,955	$ 475,333.36	$ 0.98	7.2%
Low-value services (Total)	4,510,557	$14,008,558	$3.11	5,213,340	$10,890,093	$2.09	-32.74%

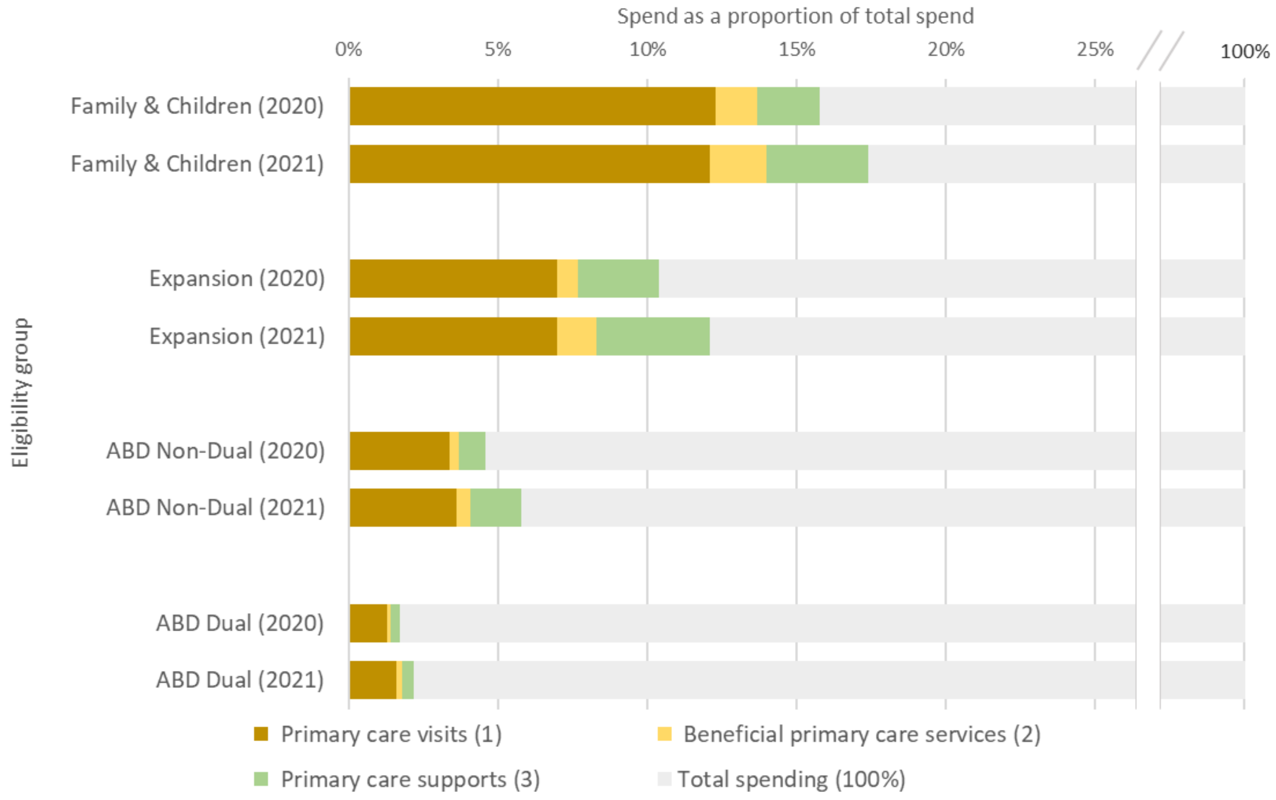
Note: Costs were inflation-adjusted to represent 2022 dollars. No statistical significance was calculated as health plans provided aggregated data;
Total eligible number of members months for each eligibility group does not match with total number of eligible member months due to rounding error in the attribution of member months per group.

Figure V.1A.4. shows primary care spending as a proportion of total expenditure for the first three primary care definitions, parsed by eligibility subgroups. Data were derived from health plan reports to MQD.

Spending on primary care as a proportion of total spend increased for all eligibility populations from 2020 to 2021. Specifically, from 2020 to 2021, proportional spend on primary care visits (definition 1) decreased from 12.3% to 12.1% for Family & Children, remained stable at 7% for the Expansion population, and increased from 3.4% to 3.6% for ABD non-Dual and 1.3% to 1.6% for ABD-Dual populations.
Beneficial primary care services (definition 2) increased for all eligibility groups. Proportional spend on Family & Children increased from 1.4% to 1.9%, Expansion population proportional spend increased from 0.7% to 1.3%, ABD-non-Dual spend increased from 0.3% to 0.5%, and ABD Dual increased from 0.1% to 0.2% from 2020 to 2021.

Additionally, proportional spend on primary care supports (definition 3) increased for all eligibility groups. From 2020 to 2021, Family & Children increased from 2.1% to 3.4%, Expansion from 2.7% to 3.8%, ABD Non-Dual from 0.9% to 1.7%, and ABD Dual from 0.3 to 0.4%.
Lastly, percent spend as a proportion of total spend on low-value services (definition 4) in 2020 ranged from 0.1% (ABD Dual) to -0.8% (Family and Children), with an overall average percentage of 0.5%. In 2021, low-value services for the demonstration populations saw a range of 0.1%-0.7% (ABD Dual, Non-ABD & Non-Expansion), with an overall percentage of 0.5% (the same overall percentage as 2020).

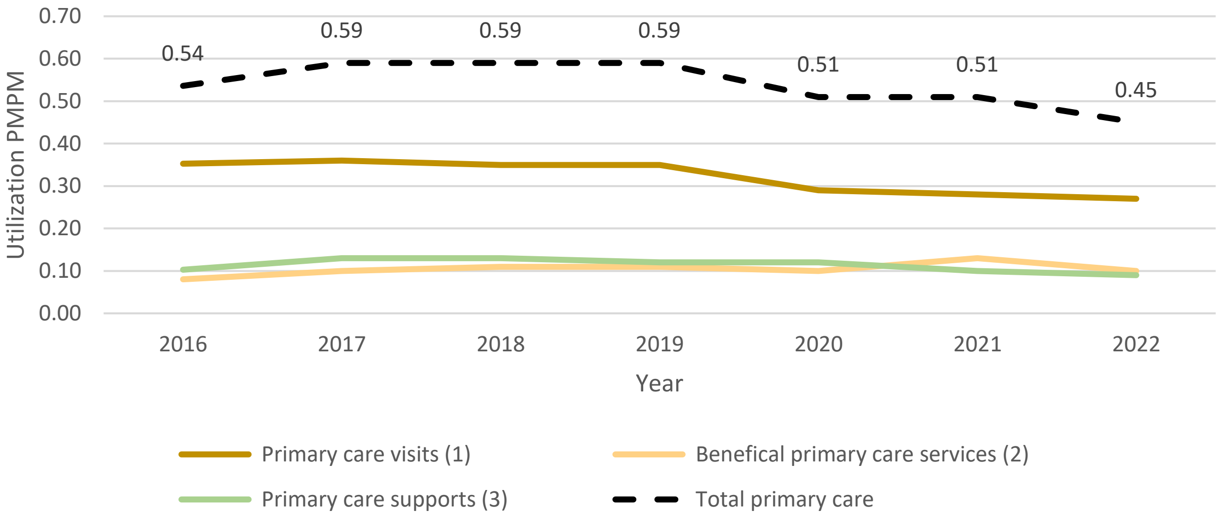
Figure V.1A.4. Primary Care Spend as a Proportion of Total Spend in 2020–2021 by Population Group (as Reported by Health Plans)



Utilization of Primary Care Services

Figure V.1A.5 demonstrates the utilization per member per month from 2017 to 2022 for the primary healthcare definitions (1) primary care visits, (2) beneficial primary care services, and (3) primary care supports. The graph indicates a decrease in utilization from the year 2019 at 0.59 claims PMPM to 0.45 claims PMPM in 2022. As indicated by the graph, utilization remained around 0.59 claims PMPM until 2019, after which a visible decrease in utilization rates occurred.

Figure V.1A.5. Utilization PMPM, by Primary Care Definition



Since the start of the demonstration period, utilization PMPM for primary care decreased significantly from 0.59 claims PMPM in 2019 to 0.45 claims PMPM in 2022. This is a 23.4% decrease in utilization. Utilization for primary care visits, beneficial primary care services and primary care supports decreased respectively by 24.9%, 14.8% and 27.1%. Table V.1A.4 displays the differences in utilization on these definitions of primary care.

Table V.1A.4. Difference in Mean Utilization PMPM on Primary Care, 2019–2022

	2019			2022			Trend		
	Number of eligible months	Incurred claims	Mean PMPM*	Number of eligible months	Incurred claims	Mean PMPM	Difference in mean PMPM 2019/2022	95%CI	*p*-value
Primary Care Visit (1))	4221153	1497545	0.3530	5571323	1477407	0.2652	-24.9%	8.93 - 9.45	<.001
Beneficial Primary Care Services (2)	4221153	483721	0.1140	5571323	541094	0.0971	-14.8%	1.31 - 1.43	<.001
Primary Care Supports (3)	4221153	521861	0.1230	5571323	499809	0.0897	-27.1%	5.29 - 5.89	<.001
Primary Care Services (Total)	4221153	2503127	0.5900	5571323	2518310	0.4520	-23.4%	15.71 - 16.60	<.001

Comparison between Utilization and Spend

Both primary care expenditure and utilization decreased from 2019–2022. Spending decreased to a larger extent, with decreases in primary care visits (Definition 1, -29.0%), beneficial primary care services (Definition 2, -41.0%), and primary care supports (Definition 3, -42.3%), resulting in a total decrease in 'valuable' primary care expenditure of -33.5%. Utilization decreased over the same period with primary care visits (Definition 1, -24.9%) beneficial primary care services (Definition 2, -14.8%), and primary care supports (Definition 3, -27.1%), resulting in a total decrease in 'valuable' primary care utilization of -23.4%.

Figure V.1A.6. demonstrates the trend in average spend per claim from 2016 to 2022. The graph indicates an increase in average spend per primary care claim from 2016 to 2019 with a peak annual average of $81.41 per claim, after which the spend per claim decreased to $71.06 in 2022.

Figure V.1A.6. Mean Spend Per Claim, by Primary Care Definition, 2016–2022

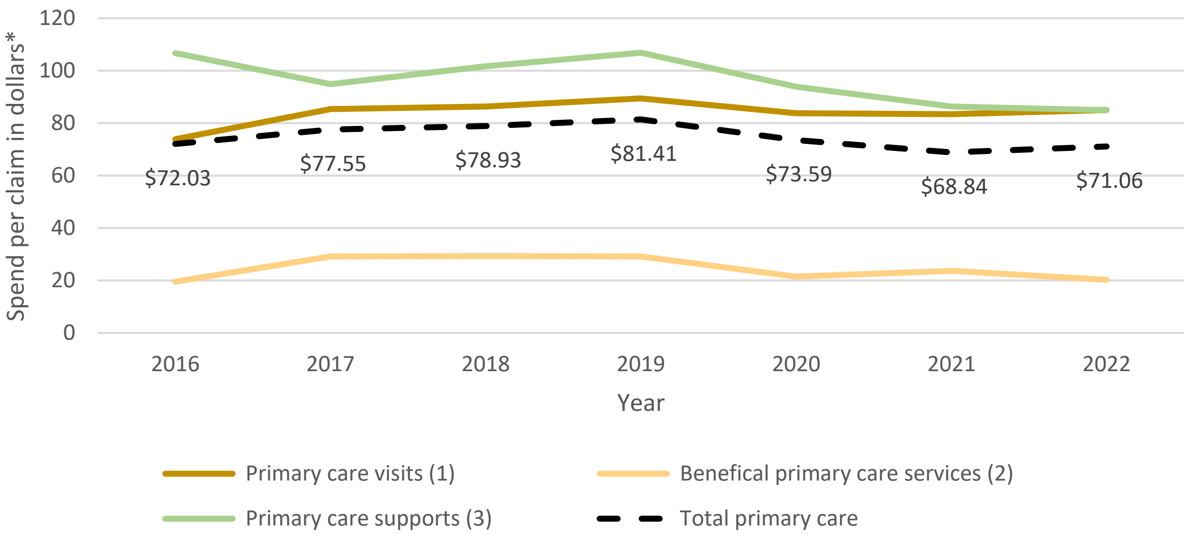


Table V.1A.5. compares the differences in mean spend per claim between 2019 and 2022. Since 2019, mean spend per claim has reduced by 5.0% for primary care visits, 30.4% for beneficial primary care services, and 20.5% for primary care supports.

Table V.1A.5. Difference in Mean Spend Per Claim on Primary Care, 2019–2022

	% Reduction Claims	% Reduction Spend	Mean spend / claim 2019	Mean spend / claim 2022	Trend 2019/2022
Primary Care Visit (1))	-24.9%	-29.0%	$89.41	$84.96	-5.0%
Beneficial Primary Care Services (2)	-14.8%	-41.0%	$29.20	$20.31	-30.4%
Primary Care Supports (3)	-27.1%	-42.3%	$106.83	$84.91	-20.5%
Primary Care Services (Total)	-23.4%	-33.5%	$81.41	$71.06	-12.7%

Relationship between Utilization and Outcomes

The sample size of members that were included in the analysis was 114,226. As detailed in Table V.1A.6, around seventy percent of members had at least one primary care visit (72.7%) and received at least one beneficial primary care service (70.0%), and the majority of members had at least one claim for primary care supports in 2021 (85.9%). Bivariate analyses showed that age, sex, race/ethnicity, island, and CDPS risk score were correlated with primary care utilization (p<0.001).

Table V.1A.7. demonstrates the relationship between primary care utilization and health outcomes. Use of primary care visits was negatively associated with inpatient (IP) visits, indicating those members who had at least one primary care visit were marginally less like to have IP visits (Coefficient=-0.02, p<0.05). For members with IP visits, having at least one primary care visit was related to shorter stay for the IP (Coefficient=-0.03, p<0.01). Beneficiary primary care services were not related to ED visits, IP visits, or IP length of stay. Members with at least one primary care supports were more likely to have longer stay if having any IP (Coefficient=0.03, p<0.05). Although some significance was found between primary care utilization and health outcomes, the effect sizes were very small.

Table V.1A.7. also showed that primary care visits were positively associated with better HbA1c control and blood pressure control, as well as timely follow-up after ED visits or hospitalization for behavioral health problems (p<0.01). Beneficiary primary care services was related to better HbA1c control (p<0.001) and follow-up within 30 days of ED visits for mental illness (p<0.05), though the effect size tended to be very small for HbA1c control. Additionally, primary care supports were only significantly linked to timely follow-up after ED visits or hospitalization for behavioral health problems (p<0.01). We did not find a significant association between primary care supports and diabetes care performance.

Results showed that multicollinearity was not present, residuals were independent and variance of residuals were constant. Adjusted R-squared ranged from 0.01 to 0.10 for all the models, which indicated that the models only explained a small amount of the variance of dependent variables.

Table V.1A.6 Characteristics and Primary Care Utilization in 2021 of the Sample (N=114226)

			Primary care visits (1) At least one claim in 2021			Beneficial primary care services (2) At least one claim in 2021			Primary care supports (3) At least one claim in 2021		
	%	n	%	n	*p*-value	%	n	*p*-value	%	n	*p*-value
Total			72.7	83032	N/A	70.0	79926	N/A	85.9	98075	N/A
Age											
Newborn after December 2021	1.6	1873	94.0	112	0.000	79.7	1493	0.000	99.6	1866	0.000
1-18 years old	38.9	44419	72.2	12368		69.2	30725		91.4	40588	
19-44 years old	36.1	41242	68.9	12820		68.8	28364		81.7	33680	
45-64 years old	21.3	24284	78.2	5285		73.0	17723		81.7	19835	
65-84 years old	2.0	2279	74.2	588		67.9	1547		81.3	1990	
85 years and older	0.1	129	68.2	41		57.4	74		89.9	116	
Sex											
Male	48.4	55260	70.9	39177	0.000	71.1	39267	0.000	86.3	47714	0.000
Female	51.6	58966	74.3	43835		69.0	40659		85.4	50361	
Race/Ethnicity											
Non-Hispanic White American	16.2	18468	73.8	13634	0.000	70.3	12986	0.000	79.8	14732	0.000
American Indian/Alaska native	1.9	2160	73.4	1585		69.8	1507		80.6	1740	
Asian	12.4	14198	72.1	10235		70.9	10067		85.2	12102	
Non-Hispanic Black	1.9	2175	70.7	1538		69.2	1504		82.7	1799	
Filipino	14.0	16009	71.7	11481		70.5	11280		87.7	14033	
Other Pacific Islanders	8.8	10051	65.7	6604		66.9	6722		90.3	9080	
Hawaiian (include part Hawaiian)	16.1	18363	71.1	13052		65.1	11955		80.7	14825	
Other or unknown or unspecified	28.7	32802	75.9	24883		72.9	23905		90.7	29764	
Island											
O‘ahu	61.81	70605	73.5	51888	0.000	70.9	50065	0.000	86.4	60995	0.000
Kaua‘i	4.83	5513	75.3	4150		69.4	3827		85.9	4734	
Hawai‘i	11.42	13041	70.6	9212		66.6	8686		82.7	10789	
Maui	20.13	22988	71.2	16364		70.3	16164		86.5	19890	

Molokaʻi	1.53	1747	67.3	1175		57.8	1010		78.3	1368	
Lānaʻi	0.29	332	67.2	223		52.4	174		90.1	299	
	Mean	SD	Mean	SE		Mean	SE		Mean	SE	
CDPS risk score in 2021	1.11	2.41	1.30	0.01	0.000	1.15	0.009	0.000	1.07	0.07	0.000

Table V.1A.7. Relationship between Primary Care Utilization and Health Outcomes

		Primary care visits (1)			Beneficial primary care services (2)			Primary care supports (3)		
Outcomes	N	Standardized Coefficient	Standardized Error	p-value	Standardized Coefficient	Standardized Error	p-value	Standardized Coefficient	Standardized Error	p-value
ED visits	15933	0.001	0.01	0.89	-0.0004	0.01	0.94	0.01	0.01	0.24
IP visits	6492	-0.02	0.01	0.03	0.001	0.01	0.90	0.003	0.01	0.63
IP length of stay (for IP visits>0)	6487	-0.03	0.09	0.004	-0.01	0.06	0.44	0.03	0.06	0.04
HEDIS Measures										
HbA1c Control (<8.0%)	2244	0.12	0.03	0.000	0.08	0.02	0.000	0.03	0.03	0.11
HbA1c Poor Control (>9.0%)	2244	-0.17	0.03	0.000	-0.09	0.02	0.000	-0.04	0.03	0.10
Blood Pressure Control (<140/90 mm Hg)	849	0.22	0.05	0.000	0.05	0.04	0.13	0.06	0.04	0.11
Follow-Up Within 30 Days of ED Visit for Substance Use	799	0.11	0.04	0.001	-0.01	0.03	0.65	0.12	0.04	0.001
Follow-Up Within 30 Days Post-Discharge from Hospitalization for Mental Illness	502	0.22	0.06	0.000	0.01	0.05	0.85	0.13	0.08	0.004
Follow-Up Within 30 Days of ED Visit for Mental Illness	663	0.27	0.05	0.000	0.10	0.04	0.015	0.21	0.05	0.000

§Note: i. Members without any ED visit and IP visit were excluded from the analyses due to right-skewed distribution with too many zeros.

Conclusions and Recommendations

During the 2019–2023 1115 waiver demonstration period, Med-QUEST introduced the HOPE initiative, and a desire to advance primary care and prevention through an increased investment in primary care. The initiative was introduced within the health plans' managed care contract in 2021, and baseline data on primary care spend was successfully collected for calendar years 2020–2021 by early 2023. MQD has not yet set primary care spend targets for its health plans.

This is the first time primary care spend is decomposed into several meaningful categories, worth evaluating separately (primary care visits, beneficial primary care services, primary care supports, and primary care low-value services). Evaluating spend, utilization, and outcomes in these categories will allow MQD to consider targeted goals such as decreasing wasteful spending and increasing spending on beneficial and preventative primary care services in areas with the largest impact on health care outcomes.

Spending and Utilization

Our results indicate that no increase in primary care spending occurred during the demonstration period; rather the period showed a decline in both spending as well as (to a lesser extent) utilization of primary care visits, beneficial primary care services, and primary care supports. The year-over-year change was not uniform across primary care categories. For example, when evaluating spend, the decline in spend from 2019 to 2022 was larger for beneficial primary care services than for primary care visits; the difference may be explained in part by the PCP-E program, which allowed for rate increases for providers of primary care services to match Medicare rates over the time period in question and partially mitigated the total decline that may have otherwise occurred in spend on primary care visits. This is further supported by the relatively limited reduction in average spend per claim (-5%) for primary care visits as compared to beneficial services and supports.

On the other hand, the decline in utilization during the same period (2019–2022) was larger for primary care visits rather than beneficial primary care services, indicating that people continued to receive preventative care despite delaying visits to their primary care providers during the COVID-19 pandemic. The COVID-19 vaccine may have substantially contributed to the total spend on beneficial primary care services in addition to strongly decreasing spend per claim on beneficial services (by 30%). For instance, relatively high-cost beneficial services such as mammograms and colonoscopies may have reduced, while spending and utilization of low-cost services such as COVID-19 vaccines may have increased, resulting in a decreased spend per beneficial service claim. The evaluation team did not explore differences in sub-categories of spend within each overall category of primary care spend but may do so in the future to understand the root causes underlying the patterns observed. The evaluation team did not explore differences in sub-categories of spend within each overall category of primary care spend but may do so in the future to understand the root causes underlying the patterns observed. The dip in utilization in 2020 was not noticeable for primary care supports (definition 3). This may be because behavioral health, which is included in the definition for primary care supports, was still heavily used during the pandemic through telehealth (McBain et al., 2023). The continued utilization of behavioral health might have offset a stronger decreasing trend.

Similarly, we were able to observe a 20.5% decrease in spend on low-value services from 2020 to 2021. This is a steeper decrease than expected in a single year, and might be partially attributed to the increased awareness by health plans due to the new reporting requirements on this definition.

Further, differences in (proportional) primary care spending also exist between different eligibility groups. Family & Children members have a higher proportional spending on primary care in the MQD system, while ABD and Expansion populations have a much lower proportional spending on care. These differences in spending are explained by the more complex and long-term care needed for these populations. Any changes in the composition of the Medicaid population may thus have a strong impact on overall spending.

The decrease in spending and utilization of these primary care services might be further explained by several factors that outweigh the investments made in primary care development. First, the COVID-19 pandemic occurred shortly after the start of the demonstration period. This coincides with a strong dip in spending in 2020, with a slight recovery in 2021. A freeze in disenrollment from Medicaid during the pandemic years greatly increased the size of the Medicaid population, and a large percentage of the population was not seeking care during this period, therefore reducing utilization per member. Hawaiʻi additionally implemented very strong quarantine laws in response to the pandemic resulting in a longer recovery to normal operations for the state (Bond-Smith & Fuleky, 2022). As such, the COVID-19 pandemic may continue to have a long-lasting impact on the on the provision of care and availability of primary care services in the state.

Second, Hawaiʻi is facing a long-term challenge with provider shortages in the state. In 2022, Hawaiʻi faced an unmet need of 776 physicians, including a shortage of 162 primary care providers (UH System, 2022). Moreover, workforce shortages have reportedly increased by 80% from 2019 to 2022 (AMA, 2023). It is possible that the effects of provider shortages impacted the accessibility of care for members and consequently the utilization of primary care over time.

While spending and utilization on primary care decreased, it is encouraging that proportional spending on primary care saw increases from 2020 to 2022, indicating a recovery after the COVID-19 pandemic, with potential to sustain the upward trend in the coming years. Reasons for the overall decline in spending and utilization of primary care requires further research by Medicaid sub-populations as well as an in-depth investigation on the shifts in costs and utilization of care. Further research is needed to understand the drivers of primary care spending and utilization, as well as how providers, health plans and MQD can collaborate to increase utilization of beneficial primary care services. Initiatives started by MQD during the current demonstration period instigated a change in focus on primary care; nevertheless, initiatives that seek to increase investment in primary care are generally longer-term initiatives. At the time this evaluation was conducted, the two-year window that had elapsed since the managed care contract was revised to include the Advancing Primary Care initiative was as yet too short to move health plans towards increasing primary care investments. A continued emphasis on primary care investments is needed to achieve the long-term goals of increased utilization of primary care and consequently, its expected positive effect on health outcomes.

Relationship between Utilization and Outcomes

Across three definitions of primary care utilization, we found that primary care visits were marginally related to fewer ED visits and shorter durations of IP stays. This is consistent with previous studies that conceptualize primary care use as visits to primary care physicians (Bradley et al., 2018; Oh et al., 2022). Increased primary care visits were found to be related to reduction of non-urgent ED visits in Bradley et al.'s study (2018) and lower rates of preventable hospitalizations in Oh et al.'s study (2022). Primary care visits are the setting for preventive care provided by PCPs, often serving as the first point of care for an individual. These results strongly support MQD's investment in primary care visits to improve health outcomes.

Primary care supports were found to positively correlate with longer IP stays, with a small effect size. Overall, we did not find a robust, significant relationship between health outcomes and primary care utilization in the studied frame. It is hypothesized that increased primary care utilization may lead to decreased ED and IP utilization, yet the impact of primary care utilization on these outcomes might be more difficult to detect within only a single year of observation; this due to the delayed effects of seeking and receiving primary care services, especially for more comprehensive primary care services such as the beneficiary primary care services and primary care supports identified in this study. An evaluation study from Fu et al. (2022) concluded that it takes two to three years to show effects on ED visits and may take six years before a reduction in hospitalizations can be seen after the intervention of comprehensive primary care (Fu et al., 2022).

More significantly, our findings indicated that primary care visits were positively associated with better diabetes control and timely follow-up of ED visits and hospitalization for behavioral health issues. The relationship between primary care visits and improved diabetes control was also documented in previous studies (Smith et al., 2015; Wolters et al., 2017). It was also documented that access to primary care was associated with follow-up care (Price et al., 2020).

Beneficiary primary care services were not associated with most HEDIS measures. Beneficial primary care services are defined as preventive care with a focus on high value care services such as screenings, assessments, and immunizations provided or referred in the primary care setting. These services are likely to result in strong improvements of specific healthcare outcomes over a longer period of time. For instance, increased investments in cervical cancer screening will be more likely to show outcomes for cervical cancer mortality over an extended period of time, rather than the health outcomes evaluated in the current analysis.

Primary care supports were found to be associated with improved timely follow-up after ED visits or hospitalization for behavioral health problems. Compared to primary care visits and beneficial primary care services, primary care supports are more broadly defined. The definition includes the set of care services that engage, support, stabilize, and improve management of the member in the outpatient setting. Examples include care coordination and behavioral health supports. Such supports integrated in primary care system have been associated with improved behavioral healthcare, including use of coping strategies, medication adherence, patient satisfaction, following relapse preventions plans (Robinson et al., 2020), and care engagement (Woodward et al., 2024).

Our findings suggested that the relationships between primary care use and healthcare measures varied depending on which operationalization was employed for primary care. Although we did not find similar studies that compared how different operationalizations of primary care differed in relation to healthcare measures, our study echoed previous studies that advocated for well-defined operational components for primary care and more specific strategies with clear goals in primary care practice (Jimenez et al., 2021; van Gool et al., 2021). Although primary care utilization was significantly related to some dependent variables, the low R-squared demonstrated that other unobserved factors are also playing a part.

Lessons Learned and Future Recommendations

While spending and utilization on primary care have not increased over time for the Medicaid population, our results indicate that the use of primary care is associated with improved short-term health outcomes. Moreover, the division of all primary care into the complementary primary care definitions allows us to identify areas where investment in primary care can be further supported, and provides the groundwork for further investigations into health care outcomes tied to each of these definitions of primary care investments. These results further emphasize the importance of investment in primary care to support the health of the Medicaid population, especially considering the visible effects of the COVID-19 pandemic on utilization and spending on primary care in Hawaiʻi's Medicaid population.

Of particular interest to future research and evaluation will be whether the trends from the years immediately following the COVID-19 pandemic reflect a permanent shift in spending and utilization, or are a temporary adjustment to the disruptive effects of the pandemic and the healthcare system's response.

Given some of the dynamic and cumulative impacts of COVID-19 on health care, a systems evaluation approach to primary care is needed. Watt, O'Donnell and Sridharan (2011, p. 4) have argued for focusing on coverage, continuity, coordination, balance and sustainability in evaluating primary health care. COVID has impacted each of these dimensions of primary health care. A systemic perspective in future evaluations will need to incorporate a dynamic perspective on the impacts of the pandemic over time due to delayed care.

Project 1B: Care Coordination for Beneficiaries with Complex Conditions

Introduction and Background

The US healthcare system is highly complex and fragmented, which creates substantial barriers to both preventative and crisis-focused healthcare for Medicaid members with multiple, complex health needs (Assefa et al., 2022). Some barriers to care include undiagnosed health conditions, confusion about which services are needed and available, where and how to access services after referral, and lack of clarity on how much health services will cost (Miller et al., 2009). Transportation and other economic and social factors can also be a barrier to care, as well as language, lack of childcare, low health and digital literacy, and inability to take time off work, among others (Bellerose et al., 2022).

Providers also face many challenges in their efforts to deliver integrated health care services that can help bridge these gaps and improve health outcomes for their patients (Dean et al., 2019). Providers are frequently pressured to limit their time with patients, even those with complex health needs, and face multiple, competing demands such as extensive documentation requirements (particularly for services that require pre-authorization), high caseloads, understaffing, burnout, and pressures to provide services reimbursable at a higher rate (Dyrbye & Shanafelt, 2011; Zeng, 2016). Further, electronic health records from multiple sources are often disconnected, limiting both patient and providers' ability to understand and integrate vital health information, including diagnoses, allergies, prescriptions, medical test results, clinical summaries and case notes, and social risk factors (such as housing status, employment status, food security and isolation) (Cantor & Thorpe, 2018; Gottlieb et al., 2015). These barriers and others may negatively impact Medicaid members' health, leading to poorer individual outcomes, worse quality of life, low confidence in the medical system, and greater cost of care.

Care Coordination

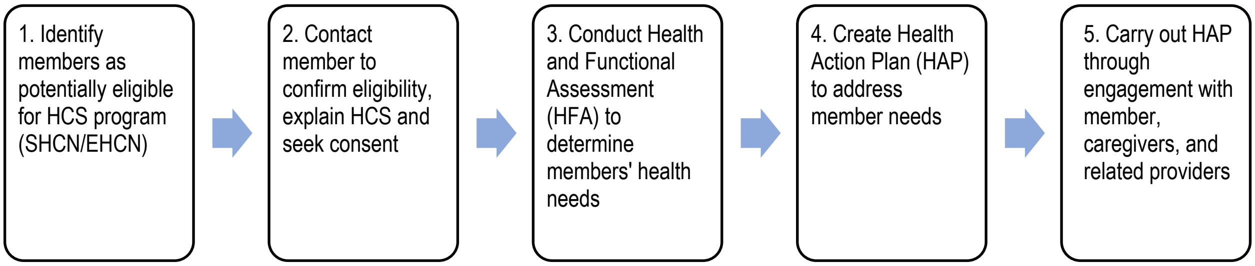
In order to address these barriers, MQD has implemented a care coordination program for individuals with complex care needs to receive Health Coordination Services (HCS). The purpose of HCS is to support individuals with complex health needs to navigate the complexities of our health care system, access high quality preventative care, manage chronic conditions, and address social risk factors. The 1115 waiver demonstration hypothesized that providing these services to individuals with special care needs in Hawaiʻi's Medicaid population would simultaneously improve health outcomes and lower costs for the participating individuals.

Specifically, MQD hypothesized: "Improving care coordination (e.g., by establishing team-based care and greater integration of behavioral and physical health) will improve health outcomes and lower the total cost of care for beneficiaries with complex conditions (i.e., high-needs, high-cost individuals)."

Beneficiaries with Complex Conditions

Within the Care Coordination program implemented by MQD, beneficiaries with complex conditions are identified as having Special Health Care Needs (SHCN) or Enhanced Health Care Needs (EHCN). Figure V.1B.1 provides an overview of the HCS Delivery process.

Figure V.1B.1 Overview of Healthcare Coordination Services (HCS) Delivery Process



Special Health Care Needs (SHCN)

SHCN beneficiaries are identified by MQD as members with “chronic physical, behavioral, developmental, or emotional conditions that require health-related services of a type or amount that is beyond what is required of someone their general age" (Health Plan Manual, 2020. Ch.6).

Additionally, members who are at risk for serious health challenges may be identified for SHCN services as well. These services are intended to ensure SHCN members receive the necessary support, treatments, and interventions to manage their conditions effectively. Health care needs for each SHCN member are identified and a Health Action Plan (HAP) is created to best support their individual needs.

Enhanced Health Care Needs (EHCN)

EHCN population are SHCN individuals who have complex and costly health care needs, or who are at a high risk of developing such conditions in the near future. These individuals are considered highly impactable, meaning their health outcomes can be significantly improved with appropriate care and coordination. EHCN services are focused on providing comprehensive and coordinated care to address the complex needs of these individuals. This involves a proactive and collaborative approach among healthcare providers, specialists, and other stakeholders to ensure that all aspects of the individual's health are effectively managed. The goal is to improve health outcomes, enhance quality of care, and reduce overall healthcare costs by preventing or minimizing the impact of serious health conditions. These services aim to ensure seamless communication and collaboration among various healthcare providers involved in the individual's care. By coordinating care and sharing information, EHCN services help to prevent fragmentation and ensure that all healthcare professionals involved are well-informed and working together to provide the best possible care.

Evaluation Approach

Research Questions

The purpose of this evaluation is to assess the impact of healthcare coordination services to support individuals with complex health needs (SHCN and EHCN population). Specifically, this evaluation aims to answer two research questions in the Table V.1B.1.

Table V.1B.1. Care Coordination for Beneficiaries with complex conditions Original Research Questions

RQ 1B.1: Will care coordination for individuals identified as having complex health needs result in improved health outcomes?
RQ 1B.2: Will care coordination for individuals identified as having complex health needs result in lowered utilization of the healthcare system, and a slower rate of expenditure growth?

Evaluation Activities

The introduction of the HOPE Strategy and the approval of the current 1115 waiver demonstration had far-reaching impacts on the strategic approach that MQD implemented to reorient its managed care program towards the triple aim of better healthcare and better health outcomes at a lower cost. As such, the onset of this 1115 waiver evaluation coincided with a substantial change in the overall managed care contract, and in tandem, the data and evaluation culture as well as data reporting package within MQD and thus with the health plans. This waiver demonstration period marked the first time that health plans in Hawaiʻi were required to provide such a high volume of detailed, individual-level metrics necessary for the evaluation and to incorporate those data and metrics into their quarterly reports; this required substantial collaboration between the evaluation team, health plans, and MQD. Additionally, operational definitions of care coordination, and data sources to match them, are fundamentally necessary to answer the overall research questions.

While the proposed evaluation design was exclusively outcome oriented, the evaluation team carried out extensive relationship building, capacity building, technical assistance, and process evaluation over the demonstration period through consistent contact with MQD and health plans.

Due to the developmental stage of the data collection methods and the active efforts carried out to improve the program, the evaluation team adjusted our analytical approach to align its feasibility with the available information. First, we created an overview of the available data and variables. Second, we selected data for the analyses; and third, we selected relevant measures and an appropriate statistical approach.

Selection of Data Sources for Evaluation

The evaluation team requested raw data extracts from health plans for all their SHCN/EHCN members since 2014.

In order to answer the research questions, the evaluation team extracted variables which allowed us to identify enrolled SHCN/EHCN members, length of enrollment in the program, reasons for exiting the program, and HCS interactions/contacts. Table V.1B.2 shows the availability of each variable from each health plan.

Enrollment

For our analysis, we included members who were enrolled in the program continuously for at least one year before the evaluation period. Participation in SHCN/EHCN HCS program relies on a rolling enrollment process. Data extracts from all five health plans contained variables that allowed the evaluation team to identify SHCN/EHCN members and how long they were enrolled in the program. To obtain an adequate sample size of members who were enrolled in the program continuously for at least one year before the evaluation period, the evaluation team analyzed the following variables from each health plan: SHCN/EHCN enrollment start date, active SHCN/EHCN members until data extract date (March 2023), and sample size of SHCN/EHCN members enrolled continuously for at least one year.

Member health status

The HCS data obtained from health plans was merged with Chronic Illness and Disability Payment System (CDPS) risk score data available from MQD actuaries. Only members who had attributed risk scores were included in the analyses. We investigated the availability of risk scores calculated by health plans as well as MQD's actuarial risk scores. The inclusion of risk scores allowed the evaluation team to stratify members by health acuity; however, the data had some limitations. For example, MQD does not calculate risk scores on dually-enrolled members (members with both Medicare and Medicaid) since it does not have a comprehensive understanding of the health and costs of these members. To understand the impact of this limitation, the evaluation team investigated the percentage of dual members among continuously enrolled members in each health plan.

Inclusion of health plan data

Only data from health plan 2 (health plan 2) was included in the evaluation of SCHN/EHCN. Data from the other four health plans were omitted due to various reasons, a) Data from health plan 4 only includes members who enrolled in SHCN/EHCN starting from 2023; b) health plan 3 had a too-small sample size (n=177); c) health plan risk score data could not be determined for health plan 4; and for health plan 1 and health plan 5, the final sample size with CDPS risk score data was too small and we were not able to determine the date when health plans risk scores were measured.

Table V.1B.2. Description of Healthcare Coordination Data Extract from Health Plans

MGOs	Health plan 1	Health plan 2	Health plan 3	Health plan 4	Health plan 5
Enrollment in SHCN/EHCN Program	✓ Variable name: care management plan	✓ Variable name: care coordination program description (i.e., LTSS, SHCN, at risk, EHCN)	✓ Variable name: program (i.e., HCBS, SHCN, EHCN, LTSS, CIS, GHP, LOC)	✓ Variable name: profile cohort name (i.e., DDD, Deleted CM, EHCN, HI-At Risk, HI-LTSS, etc.)	✓ Variable name: SHCN status code
Member months in SHCN/EHCN program (start and end date)	✓	✓	✓	Not reported	✓
SHCN/EHCN disenrollment reason	Not reported	✓	✓	Not reported	✓
HCS contact (interaction) data	✓	Only available for members in the LTSS program	✓	✓	✓
Risk score calculated	✓ Continuous	✓ Continuous	Not reported	✓	✓ Continuous

internally by Health plans	(Repeated measure without date of measurement)			Ordinal (low, moderate, high)	(Repeated measure without date of measurement)
Earliest SHCN/EHCN enrollments start date	✔ 04/04/2021	✔ 12/18/2014	Excluded from further investigation	Excluded from further investigation	✔ 05/02/2018
Active SHCN/EHCN members until data extract date (March 2023)	n=767	n=2887			n=2331
SCHN/EHCN member enrolled continuously for at least one year	✔ 2022q1-2022q4 n=495	✔ 2020q3-2022q4 n=2538			✔ 2022q1-2022q4 n=1556
Sample size of continuously enrolled SHCN/EHCN members with CDPS risk score data	n=319	n=2489			n=623

Data Description

This section of evaluation uses data extracts from health plan 2. The sample consists of members who were continuously enrolled in the SHCN/EHCN healthcare coordination program from July 1st, 2020 (2020 Quarter 3) through December 31st, 2022 (2022 Quarter 4). Other than data extract from health plan 2, this section of evaluation also relied on encounter data for key variables like total expenditure, health utilization, and health outcomes.

Measures

Independent Variable—Receiving Healthcare Coordination Service

The independent variable of this evaluation was 'receiving healthcare coordination service' as defined by data that indicated that individuals were 'engaged' or 'non-engaged' in HCS. Engaged included members who were both enrolled as well as had any interaction with the program. Non-engaged included members who were enrolled but did not interact with the program.

Table V.1B.3 displays the how the determination of engaged and non-engaged members was made by the evaluation team based on available data on enrollment status and reason for disenrollment.

Table V.1B.3 Description of Enrollment Program Status and Discontinuation Reason for Health Plan 2

Enrollment program status	Discontinuation reason if closed	Defined engaged vs. non-engaged
Engaged		Engaged
Unengaged		Non-engaged
Closed	Enrolled in CCS	Engaged
	Goals Met	Engaged
	Institutionalized	Engaged
	Member transferred to LTSS	Engaged
	Outside Referral	Engaged
	Plan Termination	Engaged
	Referred to another program	Engaged
	Transitioned to Hospice Care	Engaged
	Unable to Locate	Non-engaged
	Declined	Non-engaged
	Denied for Services	Non-engaged

Outcome Measures

Outcome measures evaluated included total expenditures, healthcare utilization, and health outcomes in calendar year 2022, when members had been enrolled in the program for at least a year and half (from 2020 Q3 to 2021 Q4). All measures used encounter data from MQD's HPMMIS system.

Total expenditures included payment for healthcare costs from all coverage sources (Medicaid, Medicare, and other coverage). Besides total expenditure for all healthcare services member received, total expenditures for primary care, emergency department (ED) services, inpatient services, and home health services were also separately investigated.

Healthcare utilization was measured as the count of primary care visits, beneficial primary care services, and primary care supports (as defined in this evaluation report in section V.1A, Primary Care), home health visits, ED visits, and inpatient visits.

Health outcomes evaluated included counts of ED visits and inpatient visits.

Covariates

The analyses include age as of March 2023, sex, English as primary language, race/ethnicity, island of residence, and actuarial risk score as covariates:

- Age was categorized into five groups: under 18 years old, 19–44 years old, 45–64 years old, 65–84 years old, 85 years and older.
- Sex (0=male, 1=female) and English as primary language (0=no, 1=yes) were analyzed as binary variables.
- Race/ethnicity was categorized into seven groups: non-Hispanic White, American Indian/Alaska native, Asian or Pacific islander, non-Hispanic Black, Native Hawaiian (include part Hawaiian), other, or unknown or unspecified.

- Members residing on Molokaʻi and Lānaʻi islands were grouped together due to small sample size, resulting in six groups for island of residence: Oʻahu, Hawaiʻi Island-East, Hawaiʻi island-West, Kauaʻi, Molokaʻi/Lānaʻi, and Maui.
- Actuarial risk scores (prospective CDPS risk scores) calculated based on measurement year 2019 were included as a prospective indicator of health status in 2020 prior to being engaged in HCS in 2020.

Statistical Analysis

We first conducted a descriptive analysis to describe the overall characteristics of the sample, as well investigate the unadjusted difference between the non-engaged and engaged groups. We then conducted propensity score matching analysis to investigate the average treatment effect of HCS engagement in 2022 (after members were enrolled in the program for one and half year). Lastly, we used kernel-based propensity score matching difference-in-difference analyses to examine differences in outcome measures between the two groups from 2019 (pre-intervention period) to 2022 (when members had been enrolled in the program for one and half years).

Due to the absence of longitudinal data at the time of analysis, the planned time-series analysis was not feasible. Instead, using the kernel-based propensity score matching difference-in-difference model, the evaluation team aimed to identify the treatment effects of engagement in HCS based on data from one baseline (in 2019) and one follow-up (in 2022) for all SCHN/EHCN population in health plan 2. Parallel trend assumption that assumes the difference in outcome measures among the engaged and non-engaged groups was constant before the intervention was tested.

Results

Characteristics of Sample and Unadjusted Differences between Non-Engaged Group and Engaged Group

The final sample included 2,538 unique individuals. As detailed in Table V.1B.4, the unadjusted difference in characteristics between engaged members and non-engaged members underscored the need for matching. Compared to members that were not engaged with HCS, engaged members were more likely to be older ($p<0.01$), to be of unspecified race/ethnicity, Asian or Pacific Islander, or non-Hispanic White ($p<0.001$), to be an English speaker ($p<0.001$), to live on the island of Kauaʻi, Lānaʻi, or Molokaʻi ($p<0.001$), and to have higher CDPS risk score ($p<0.001$). The effectiveness of matching at balancing these characteristics between engaged members and non-engaged members was assessed using standardized differences after matching and variance ratios before and after matching. Post-estimation shows that matching improved covariate balance.

Table V.1B.4. Characteristics of Sample and Unadjusted Difference between Two Groups (N=2,538)

	Total		**Non-engaged**		**Engaged**		***p*-value**
	%	N	%	N	%	N	
All			84.7	2150	15.3	388	
Enrolled before 2019q2 (including 2019q2)	11.2	283	35.0	99	65.0	184	<0.001
Enrolled after 2019q2	88.9	2255	91.0	2051	9.1	204	
Age							
0-18	37.2	943	90.8	856	9.2	87	<0.001
19-44	39.2	995	90.0	895	10.1	100	
45-64	19.2	486	68.7	334	31.3	152	
65-84	4.4	112	58.0	65	42.0	47	
85 and over	NR	NR	NR	NR	NR	NR	
Sex							
Male	53.3	1353	85.5	1157	14.5	196	0.23
Female	46.7	1185	83.8	993	16.2	192	
Race/ethnicity							
Non-Hispanic White	19.9	506	83.8	424	16.2	82	<0.01
American Indian/Alaska Native	1.5	38	97.4	37	NR	NR	
Asian	16.5	417	82.1	343	18.0	75	
Non-Hispanic Black	2.1	54	88.9	48	NR	NR	
Filipino	11.6	289	82.8	240	17.2	50	
Other Pacific Islanders	3.7	92	87.0	80	13.0	12	
Native Hawaiian (include part Hawaiian)	22.0	558	89.4	499	10.6	59	
Other/Unknown/Not Provided	23.0	584	84.7	481	17.6	103	
English Primary Language							
No	42.2	1071	88.9	952	11.1	119	<0.001
Yes	57.8	1467	81.7	1198	18.3	269	
Island							
O‘ahu	57.4	1456	82.5	1201	17.5	255	<0.001
Hawai‘i-E	22.2	564	91.1	514	8.9	50	
Hawai‘i-W	8.6	219	85.8	188	14.2	31	
Kaua‘i	4.9	125	81.6	102	18.4	23	
Lāna‘i/Moloka‘i	NR	NR	NR	NR	NR	NR	
Maui	6.5	164	83.5	137	16.5	27	
	Mean	SD	Mean	SD	Mean	SD	*p*-value
CDPS Risk Score 2019	1.63	2.22	1.43	1.93	2.81	3.28	<0.001
Notes: *Pearson Chi-Square tests were conducted for categorical variables while independent sample t-test was conducted for the only continuous variable—CDPS Risk Score 2019							

Outputs from Propensity Score Matching

Table V.1B.5 presents outputs of treatment effects of HCS engagement after matching. Being engaged with HCS was associated with higher total expenditures in 2022 (coefficient=9847.57, *p*<0.001).

Members engaged in HCS have higher total expenditures for home health services (coefficient=1100.27, *p*<0.01) as well as higher home health utilization (coefficient=4.20, *p*<0.01) in 2022.

There was no significant effect of HCS engagement on total Medicaid expenditures on inpatient services, home health services, or primary care services. We also did not find any significant effect of HCS engagement on primary care utilization, inpatient services utilization, or home health services utilization.

Table V.1B.5. Effect of HCS engagement on Healthcare Expenditure and System Utilization

	Total Members			
Samples in non-engaged vs engaged after matching	1801			
Non-engaged	1547			
Engaged	254			
	Coefficient	**SE**	**%95 CI**	***p*-value**
Total expenditures (in dollars)				
Total expenditure in 2022	9847.57	2613.51	(4725.18, 14970.00)	<0.001
Total expenditure of primary care visits in 2022	893.16	2089.28	(-3201.749, 4988.07)	0.67
Total expenditure of beneficial primary care services in 2022	72.90	166.85	(-254.11, 399.92)	0.66
Total expenditure of primary care supports in 2022	149472.10	143773.30	(-132318.3, 431262.6)	0.30
Total expenditure of ED services in 2022	4.26	19.44	(-33.85, 42.37)	0.83
Total expenditure of inpatient services from 2020q3 in 2022	38.92	42.97	(-45.30, 123.14)	0.37
Total expenditure of home health services in 2022	1100.27	350.60	(413.12, 1787.43)	<0.01
Health utilization (in counts)				
Primary care visit counts in 2022	-1.24	4.99	(-11.02, 8.54)	0.80
Beneficial primary care service counts in 2022	1.13	2.81	(-4.38, 6.64)	0.69
Primary care support counts in 2022	6.45	3.94	(-1.29, 14.19)	0.10
Home health visit counts in 2022	4.20	1.31	(1.63, 6.77)	<0.01
Health outcomes (utilization of ER and inpatient services)				
ED visit counts in 2022	0.17	0.34	(-0.51, 0.84)	0.63
Inpatient visit counts in 2022	0.24	0.41	(-0.56, 1.04)	0.55

Notes: *Post estimation after matching shows that members who are in two groups have no significant difference on all covariates.
*Analysis dropped members older than 85 years old and who are American Indian/Alaska Native due to small sample size.
*Total expenditure of primary care, ED services, inpatient services, and home health services only include amount paid by Med-QUEST.

Outputs from Kernel-based Propensity Score Matching Difference-In-Difference Analysis

Table V.1B.6 presents outputs of outcome measures change from 2019 to 2022 between two groups. First, expenditures on home health services also increased from 2019 to 2022 in the engaged population relative to the non-engaged population (*p*<0.05). Second, ED expenditures, and concomitant ED visits declined in the engaged population relative to the non-engaged population (*p*<0.01). Lastly, the utilization of beneficial primary care services declined in the engaged population compared to the unengaged population (*p*<0.01).

Table V.1B.6. Difference in Difference of Outcome Measures between the Groups that were Unengaged and Engaged in HCS, Comparing the Baseline (2019) and Evaluation (2022) Years

	Coefficient	SE	*p*-value
Total expenditure			
Total expenditure	2128.81	1704.09	0.21
Total expenditure of primary care visits	1052.08	855.88	0.22
Total expenditure of beneficial primary care services	-133.99	92.20	0.15
Total expenditure of primary care supports	12000.00	6400.00	<0.10
Total expenditure of ED services	-36.40	13.19	<0.01
Total expenditure of inpatient services	-61.26	55.28	0.27
Total expenditure of home health services	787.26	375.45	<0.05
Healthcare utilization			
Count of primary care visits	-0.06	2.30	0.98
Count of beneficial primary care services received	-0.54	2.04	<0.01
Count of primary care supports received	1.53	2.32	0.51
Count of home health visits	1.85	1.19	0.12
Health outcomes (utilization of ED and inpatient services)			
Count of ED Visits	-0.93	0.31	<0.01
Count of Inpatient Visits	-1.14	0.60	<0.10

Notes: *Analysis dropped members older than 85 years old and who are American Indian/Alaska Native due to small sample size.
*Total expenditure of primary care, ED services, inpatient services, and home health services only include Medicaid paid amounts.

Conclusions and Recommendations

While outputs need to be interpreted with caution, this section of the 1115 waiver evaluation has several conclusions that can provide implications for future policy and practice regarding HCS among SHCN/EHCN population.

First, although 2,538 members in health plan 2 were continuously enrolled in SHCN/EHCN program from 2020 Quarter 3 to 2022 Quarter 4, only 15% were engaged with HCS. Bivariate analysis revealed factors that may be associated with the high non-engagement rate. For example, members who do not speak English as primary language were less likely to be engaged, which implicates language barriers as a potential factor that predicts a lack of participation. Moreover, members who live on Kauaʻi, Lānaʻi, or Molokaʻi were more engaged as well, which might imply closer ties with local HCS on neighbor islands. In order to increase the HCS engagement rate for the full SHCN/EHCN population, more investigation is needed to explore why SHCN/EHCN engagement is low for certain groups and what can be done to increase engagement and follow up.

Second, our outputs suggest that: 1) engagement in HCS predicts higher utilization on home health services and, 2) HCS engagement also relates to higher expenditure on home health services, as well as lower expenditure on ED services, and utilization of ED services. The purpose of HCS is to support SHCN/EHCN population to navigate the complexities of the health care system, access high quality preventative care, manage chronic conditions, and address social risk factors. The increased expenditure and utilization in home health services and primary care supports among members who are engaged with HCS indicate a significant step to achieve this purpose.

Home health services include direct or indirect skilled nursing services and other therapeutic services (physical, occupational, and/or speech therapy; social services; etc.) under a physician's direction to homebound patients. Home health services provided for SHCN/EHCN included skilled nursing care, physical and occupational therapies, behavioral health services, medication management, preventive care services, homemaker services, and home delivered meals. Most previous research of the effectiveness of home health services were conducted for members receiving home health services under Medicare. Previous research has demonstrated the effectiveness of home health utilization on reducing readmission death, and health cost and improving chronic conditional knowledge, self-care confidence, and quality of life (Siclovan et al., 2021; Xiao et al, 2018; Leavitt et al., 2020). Given these potential benefits of home health services, higher expenditure and utilization of home health services among SHCN/EHCN members engaged with HCS is likely to lead to lower total cost of care and improved health outcomes in the long run.

The outputs showed a significant increase of primary care supports among SHCN/EHCN members engaged with HCS. Primary care supports are defined as a set of care services that engage, support, stabilize, and improve management of the member in the outpatient setting so as to reduce excessive and inappropriate inpatient utilization (e.g., care coordination and behavioral health supports). Given the inclusion of care coordination service codes in the definition of primary care supports, it is unsurprising that higher expenditures in this category were found for members engaged in HCS compared to those who remained unengaged. Greater access to primary care supports in general, and care coordination in particular, is inversely associated with the utilization of avoidable hospitalizations (Rosano et al., 2013) and ED services (Lowe et al., 2005). On the other hand, the results also showed a decline in the receipt of beneficial primary care services among SHCN/EHCN members engaged with HCS compared to unengaged members. This finding highlights the need to reiterate the continued value of secondary prevention even for members with complex healthcare needs, and the steadfast intent with which these members must continue to be supported in receiving screenings and other beneficial primary care services while receiving care for their complex health needs.

The major positive finding of this analysis was the decrease in utilization of ED for members engaged in HCS compared to those who remained unengaged; the decreased ED utilization was additionally associated with a significant reduction in ED expenditures. In other words, over the evaluation period (2019–2022), members who were actively engaged in receiving HCS had a relatively greater reduction in ED and inpatient utilization as well as ED costs compared to members who remained disengaged from HCS. The finding demonstrates that members who engage in HCS in fact reap the intended health and cost benefits hypothesized in Hawaiʻi's 1115 waiver. However, the finding also underscores the importance of identifying and eliminating the root causes of current high levels of non-engagement in HCS to improve population-level outcomes. Therefore, more work is needed to understand why the majority of qualifying SHCN/EHCN members remain unengaged in HCS, and how to remove the barriers identified so that more qualifying members are able to achieve the intended benefits of these services. Further work and investment in HCS will allow Hawaiʻi to achieve and demonstrate a population-level impact of HCS on the health outcomes and cost of care for its SHCN/EHCN population.

Limitations

The results of this evaluation must be interpreted with caution due to several limitations. First, only one health plan was included in the evaluation, which limits the generalizability to the Medicaid population statewide. Second, for the purpose of analysis, only members enrolled continuously from 2020 Quarter 3 to 2022 Quarter 4 were included in the evaluation. Assignment of engagement or non-engagement depended entirely on the engagement status during this evaluation period, which makes a strong assumption that engagement status remained the same before 2020 Quarter 3. This assumption introduces potential bias to the treatment dose between the two groups. Additionally, the test of parallel trend assumption showed a violation of parallel trend before the intervention. However, propensity score matching was considered as an effective coping strategy when the parallel trend assumption is violated (Ryan, et al. 2019). Lastly, with a single variable to determine whether members were or were not engaged in HCS, we were unable to evaluate the components of HCS more thoroughly, for example, by exploring how and what type of HCS are provided and at what dose.

Lessons Learned and Future Recommendations

The past two years represent the first time that health plans in Hawaiʻi have been required by MQD to provide detailed individual-level metrics necessary for the evaluation and to incorporate those data and metrics into their quarterly reports. The evaluation team undertook a detailed analysis of the types of data collected by health plans and found significant variation in the quality, completeness, and types of data currently collected, significantly limiting the possibility for a more comprehensive analysis. Further work is necessary to increase the consistency of data collection and reporting of HCS across health plans, an effort that this evaluation team and MQD are enthusiastic to engage in during the next 1115 waiver period. Despite the limitations of the data, a successful collaboration between MQD, health plans, and the evaluation team resulted in our ability to develop practical measurement of care coordination and identify data sources that could be used to evaluate the impact of these services. However, given the innovation of the waiver demonstration, the evaluation process was full of unavoidable surprises and challenges that limited the generalizability of the analysis. Below we list the challenges we encountered during the evaluation process and provide recommendations.

Recommendation 1: More clarity is needed on the conceptualization and operationalization of care coordination. For example, what care coordination services are offered, which are most needed, and how members view the impact of care coordination on their own lives is limited.

- Conduct a thorough process evaluation to identify what care coordination services are consistently needed and offered. This should engage members, providers, and health plans.
- Conduct regular randomized quality assurance calls with care coordination members to identify what needs are or are not being met.
- Establish a care-coordination patient advisory group that represents member perspectives and needs and invites provider input.

Recommendation 2: Standardized data collection and reporting system for care coordination is necessary.

- Develop parsimonious metrics to capture the delivery and dose of care coordination services on individual, provider-to-provider, and organizational levels.
- Work with health plans to integrate the fewest, most impactful metrics within their systems and require high-fidelity reporting linked to payment.

Project 1C: Home- and Community-Based Services (HCBS)

Introduction and Background

Home- and community-based service (HCBS) programs are designed to enable individuals who need long-term services and supports (LTSS) to receive care and assistance in their homes and communities. Their objective is to empower members, to enhance quality of life and to maintain their functional abilities and independence by avoiding placement into institutional settings (Neary, 1993). However, the literature on the efficacy of HCBS on health and wellbeing shows mixed results (Wysocki et al. 2015). While some studies underscore the vital role of HCBS in promoting individual autonomy and enhancing patient satisfaction (Kane, Kane, & Ladd, 1998; Weissert et al., 2005), others demonstrate no significant differences for most health outcomes by setting (Sloane et al., 2005; Frytak et al., 2001). A lack of consideration of additional factors which may impact these outcomes, such as within-setting variation and subgroup differences, may contribute to these conflicting results.

HCBS in Hawaiʻi are particularly crucial for the state's diverse population, which includes a significant elderly demographic and population of individuals with disabilities. The state's unique geographical and cultural context adds complexity to the delivery of HCBS. Efforts to strengthen and expand HCBS in Hawaiʻi aim to enhance person-centered care, improve care coordination and member well-being, reduce healthcare costs, and increase community inclusion.

LTSS focuses on individuals who have high health needs, and individual eligibility is determined through a level of care (LOC) assessment. The LOC assessment is performed by a physician, RN or APRN within a health plan or via delegated authority using a functional assessment form called Form 1147. These functional assessments should be repeated at least every twelve months, if there is a significant change in the member's condition, or by member request. As such, when repeated with fidelity, the LOC data provides a consistent, longitudinal measurement of functional status for LTSS members.

MQD provides HCBS services to two LTSS populations: (1) individuals who meet nursing facility (NF) LOC requirements, and 2) individuals who are assessed to be "at risk" of deteriorating to a NF LOC. Members who are considered NF LOC are expected to have the choice between receiving care in an institutional setting (such as a skilled nursing facility) or receiving care in a home- or community-based setting (such as a personal residence or a community care foster family home). Those who receive services in a community setting receive HCBS.

The designation of NF LOC versus At-Risk determines the amount and type of services eligible for a given member. The At-Risk population has access to a subset of HCBS that are intended to improve health and prevent deterioration to NF LOC. This includes access to home delivered meals, personal assistance, adult day health, and adult day care, among others. Table V.1C.1 below outlines the services available to LTSS members considered At-Risk or Institutional levels of care.

Table V.1C.1. HCBS Benefits for At Risk and Institutional (NF) LOC

Service	Available for individuals "At Risk" of deteriorating to institutional level of care	Available for individuals who meet institutional level of care
Adult day care	X	X
Adult day health	X	X
Assisted living facility		X
Community care foster family homes		X
Counseling and training		X
Environmental accessibility adaptations		X
Home delivered meals	X	X
Home maintenance		X
Moving assistance		X
Non-medical transportation		X
Personal assistance	X	X
Personal emergency response system	X	X
Residential care		X
Respite care		X
Private duty nursing	X	X
Specialized case management		X
Specialized medical equipment and supplies		X

Evaluation Approach

The purpose of this evaluation is to assess health outcomes and cost of care for beneficiaries with complex conditions (i.e., high-needs, high-cost individuals). The evaluation team proposed three research questions as presented in table V.1C.2.

Table V.1C.2 HCBS Original Research Questions

RQ 1C.1: Does HCBS slow the deterioration of health as reflected in the level of care among individuals meeting NF LOC criteria?
RQ 1C.2: Does length of time to enter a nursing home, patient-reported health outcomes (PROs), or total cost of care vary depending on a variety of client characteristics among individuals meeting NF LOC criteria and receiving HCBS services?
RQ 1C.3: Does length of time to enter a nursing home, PROs, or total cost of care vary depending on a variety of client characteristics among the At-Risk population?

RQ 1C.1: Does HCBS slow the deterioration of health as reflected in the level of care among individuals meeting NF LOC criteria?

This research question was answered using Form 1147 LOC assessment data. Form 1147 includes LOC assessments for activities of daily living (ADLs) such as mobility, alertness and orientation, and continence among other things. The form includes a separate section to addresses instrumental activities of daily living (IADLs), which is only completed for the At-Risk population. ADL and IADL sections of the LOC assessment are scored, and the cumulative points assigned to ADLs (or IADLs) constitute the individual's LOC score. Form 1147 also includes information about demographic characteristics (e.g., age and sex), availability of social support, and necessity of skilled procedures.

After completion, Form 1147 is usually reviewed by a health plan and then by MQD. Based on the assessment, a requested LOC (e.g., NF or At-Risk LOC) is approved, deferred, or denied. Upon an approval, approval begin and end dates are specified. The data is maintained in a database called Hawaiʻi Level of Care (HILOC).

The evaluators proposed to use survival analysis methods to answer the research question in the initial evaluation design. Due to limits in access to usable service data that occurred during the initiation of the evaluation, the feasibility of answering the evaluation questions using the proposed methods was reassessed, and the analytical methods were adapted to the available data.

For example, the primary data we accessed was the level of care (LOC) assessment data. This data tracks members' functional abilities using LOC scores, reflecting an individual's functional status and needs for assistance in activities of daily living, orientation, communication, and behaviors. However, this data does not include information about the actual services members received, which made it impossible to assess the time from receiving services to the survival outcome (entering nursing home). Given the available data, we decided to use the LOC score as the outcome instead of the duration between when Medicaid beneficiaries first started receiving LTSS and when they developed severe limitations in their functional status, as initially proposed in the Evaluation Design. Consequently, we opted for matching and linear mixed-effects modeling to address the evaluation question.

The decision to adjust analytical methods further responds to difficulties in identifying proper comparison groups due to described data limitations. For example, evaluators faced challenges in identifying a comparison group for the at-risk population, lacking information about counterparts who did not enter the program. Instead, evaluators described subgroup differences in health and cost outcomes. Employing HILOC data in longitudinal analysis for the first time, the descriptive results and evaluation method were effective in addressing research goals.

We analyzed HILOC data from May 2014 to November 2021. The approval begin date on Form 1147 was used as the anchor date for this analysis. We quantified disability using the LOC score, with a higher score indicating a higher severity of functional limitations.

The original research question was broken down into the following questions:

1. How do members who meet NF LOC, and who are living at home, in foster homes, and in nursing homes differ in their LOC score?
2. Does the receipt of HCBS result in a slower deterioration of LOC score compared to receiving care in nursing homes?

The table below summarizes the methodology for addressing these questions.

Table V.1C.3. Summary of Methodology

	How do members who meet NF LOC, and who are living at home, in foster homes, and in nursing homes differ in their LOC score?	Does the receipt of HCBS result in a slower deterioration of LOC score compared to receiving care in nursing homes?
Data source	2014-2021 HILOC	2014-2021 HILOC

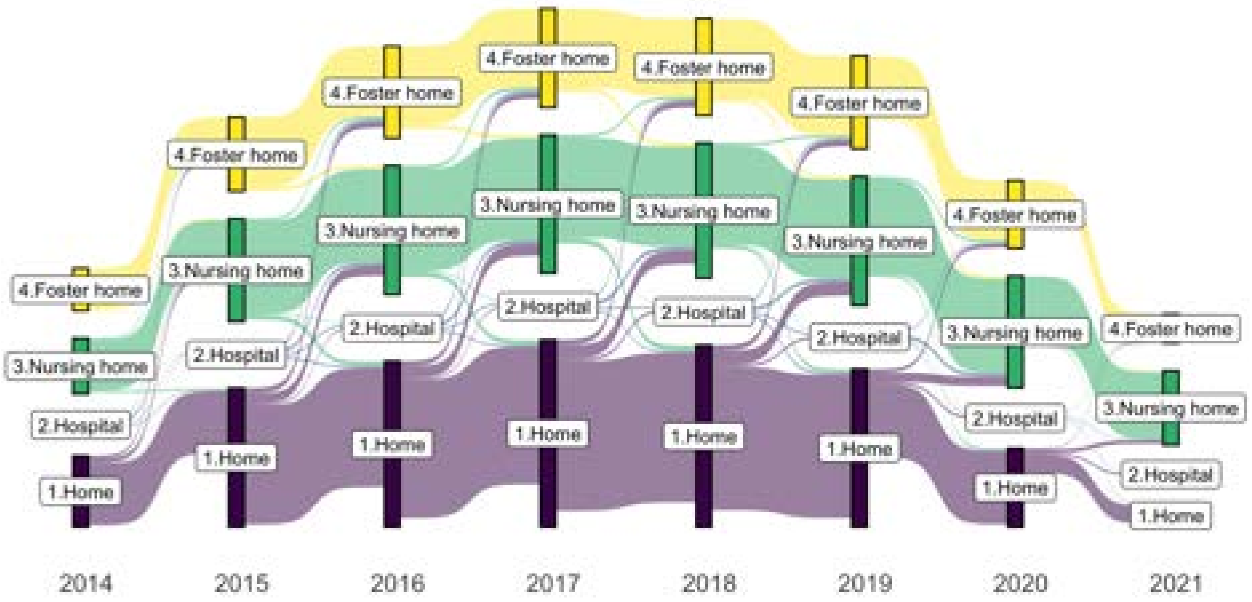
Sample selection	Those in LTSS for at least two continuous years	Those in LTSS for at least two continuous years with high severity of functional limitations (LOC score >15 points)
Outcome measure	LOC score	LOC score
Analytical approach	Descriptively compare three groups of LTSS members based on where they live (home, community foster home, and nursing home) over time, by LOC score, age, and sex	Longitudinal analysis comparing members who reside at home, nursing home, and community foster home after matching members based on age, sex, and LOC score at baseline
Comparison group	N/A	Matched individuals living in nursing homes

Longitudinal HILOC data was chosen for dates from May 2014 to November 2021 because no significant changes to the content of Form 1147 occurred during this period. Data from May 2014 to November 2021 initially included 35,582 members. This initial data set included children and youth populations as well as adults. However, we decided to focus on older adults (age 65 and above) because our comparison group was members living in nursing homes who tend to be older adults. The 2017 national data show that over 80% of nursing home residents are age 65 or older (Laws et al., 2022). The sample was reduced to 22,026 members after excluding children (Form 1147E) and reassessments that did not include LOC scores (Form 1147A) (1,405 members excluded), a small number of members reporting residence in Care Homes, External Adult Residential Care Homes, or indicating “other” for present address (460 members excluded), and individuals under 65 (11,691 members excluded).

Because we intended to track the change in LOC scores over time and members were expected to receive reassessments annually or when significant changes happen after their initial assessment, we further excluded those without follow-up assessments or with follow-up for less than two years. This left a final sample of 8,532 members.

Figure V.1C.1 shows the flow of these members in each setting (i.e., home, hospital, nursing home, and foster home) and the movement between settings between 2014 and 2021. It illustrates that most members stay within the same setting from year to year although movement does occur between all settings. Note that, compared to year 2015–2019, year 2014 has a smaller sample because it started from May 2014, and years 2020–2021 have smaller samples due to the inclusion criteria of members having at least two continuous years in the program.

Figure V.1C.1. Flow of Members Aged 65+ with At Least Two Years in the LTSS Program by Setting from 2014 to 2021.



Note: The height of the vertical bar is proportional to number of members in each setting.

Specifically, we found that between 2014 and 2021, 64% (n=5,426) of LTSS members stayed in the same setting, while 36% (n=3,106) switched between settings. Among members who stayed in the same setting, 28% were in home settings, 14% in community foster homes, and 21% in nursing homes. Once the final sample was determined, we descriptively analyzed their demographic characteristics (e.g., age and sex), LOC score, whether their caregiving support system was willing to provide/continue care if they have a home, and whether the member had a primary or secondary diagnosis of mental illness or dementia, by setting (i.e., home, community foster homes, or nursing homes) at baseline. We also described their change in LOC scores over time by setting.

We then focused on members with high LOC scores (>15 points[1]) and matched members by age, sex, and LOC score at baseline. The matched sample includes a total 1,077 members with 359 members in each of the three settings. For this high acuity group, we compared changes in LOC score by setting over time.

We also examined subgroup differences by diagnosis. Of particular interest was individuals who had dementia or mental illness as their primary or secondary diagnosis, as indicated on the Form 1147. Dementia is one of the most expensive health conditions among older adults and the most time-consuming for caregivers (Mather & Scommegna, 2020), with increasing prevalence among the older population (Alzheimer's Disease International, 2015). Psychological conditions, especially severe mental illnesses (e.g., schizophrenia and bipolar illness), are associated with early mortality and higher risk of comorbidity (The National Association of State Mental Health Directors Council, 2006). Additionally, across the U.S., states have challenges placing Medicaid members with mental

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[1] LOC score of 15 points was chosen as the cutoff point because it is the 75 percentile of LOC score for those living at home.

illness or dementia, both of which may lead to behavioral health issues that are challenging in various settings. HILOC data include the primary and secondary significant, current diagnosis reported on Form 1147; these data are captured in text fields. We used the roots of keywords, including “schiz”, “bipol”, “depres”, and “psycho” to identify members with mental illness and used “dementia” and “alzheim”' to identify members with dementia as their primary or secondary diagnosis. Although this does not include all LTSS members who have a diagnosis of mental illness or dementia, it identifies those who have mental illness or dementia listed as their primary diagnosis at the time of the LOC assessment.

RQ 1C.2: Does length of time to enter a nursing home, patient-reported health outcomes (PROs), or total cost of care vary depending on a variety of client characteristics among individuals meeting NF LOC criteria and receiving HCBS services?

The second evaluation question addresses subgroup differences within three relevant outcomes for the LTSS population—length of time to enter a nursing home, patient reported outcomes (PROs), and cost of care—with a focus on the population meeting NF LOC. We address each outcome in the following section.

Length of time to enter a nursing home

For the length of time to enter a nursing home, we analyzed 2014–2021 HILOC data and focused on those older adults (aged 65 or older) who were in the LTSS program for at least two years from 2014–2021 and entered a nursing facility. During this period 421 members switched from home to nursing homes and were approved to receive services at a nursing facility (comprising approvals for care delivered in an Intermediate Care Facility; Skilled Nursing Facility; waitlist services, meaning that the member is receiving ICF or SNF level of care while awaiting a permanent placement to become available; hospice facility; or in a subacute facility including both subacute level I and level II facilities). We counted the days from the date of the first assessment after the member was placed at home with HCBS services to the date of the first assessment after the member was placed in a nursing home and used it as our outcome measure. We estimated the average days by member characteristics such as sex and county and tested the extent to which the days to enter a nursing home varied by member characteristics.

Patient-reported outcomes (PROs)

For PROs, we analyzed a data extract from one health plan. We were not able to use data extracts from all health plans because of inconsistent data fields and data quality issues across health plans. Data extracts from each health plan varied in terms of content, available variables, format, and completeness. This made it impossible to analyze data extracts from all five health plans to address this particular research question. We chose the health plan data extract that provided the most complete information on goal attainment. This included goals set by members in the Health Action Plan and dates of goal attainment from 2021–2022 after goals were initiated. We counted the number of goals for each member and calculated the average percentage of completed goals by each member. Only 3,408 members had both demographic and goal attainment information. Among the 3,127 members who stayed in the same care coordination program (LTSS, SHCN, EHCN, or At Risk) in 2021–2022, 382 were LTSS members. Within this sample, we descriptively analyzed goal attainment by member characteristics such as age, sex, and county.

Cost of care

We used cost of care information from HPMMIS Claims and Encounter data from 2016 to 2022 to examine cost distribution. We also linked the cost data with HILOC data. Specifically, we first calculated the total cost of care for each individual for each calendar year, identified the approved LOC (i.e., whether one meets NF or At-Risk LOC) for each individual in each calendar year, and then merged records by individual identifier and calendar year. The merged data included 11,937 individuals and 44,644 records. We excluded 2,569 records of individuals meeting NF LOC or at risk for part of a calendar year (e.g., an individual with functional decline changed from At-Risk to NF LOC in a calendar year) from the analysis. Among these 44,644 records, 51% were for those meeting NF LOC and 49% were for those in the at-risk population during the calendar year.

We created three cost variables: the amount paid by Medicaid (including the amount paid by managed care and fee-for-service programs), total spending (including the amount paid by Medicaid, Medicare, and from other coverage) and percentage of total spending paid by Medicaid. We then described the overall trend in cost of care and trend by age and sex between 2016 and 2022. Note that all descriptive analyses are unadjusted.

> *RQ 1C.3: Does length of time to enter a nursing home, PROs, or total cost of care vary depending on a variety of client characteristics among the At-Risk population?*

This evaluation question addresses the same set of outcomes as RQ 1C.2 but focuses on the At-Risk population.

Length of time to enter a nursing home

For the length of time to enter a nursing home, we analyzed 2014–2021 HILOC and focused on those who were in the program for at least two years in 2014–2021. Among the 722 members switching from home to nursing homes during this period, 301 members were approved at an At-Risk LOC status in their first assessment when they were at home. We estimated the average days to enter a nursing home by member characteristics such as sex and county and tested the extent to which the days to enter a nursing home varied by member characteristics. We also compared the length of time to enter a nursing home of At-Risk versus LTSS members who met NF LOC.

Patient-reported outcomes (PROs)

For PROs, we analyzed the goal attainment status from one health plan data extract. Among 3,127 members who stayed in the same program with both demographic and goal attainment information in 2021-2022, 479 were At-Risk members. We described goals that were completed by member characteristics such as age, sex, and county and compared the goal completion of At-Risk versus LTSS members who met NF LOC.

Cost of care

We used the same data for the At-Risk population as that used for individuals meeting NF LOC in RQ 1C.2. We described the overall trend of cost and trends by age and sex between 2016 and 2022 in comparison to the trends of individuals meeting NF LOC.

Results

RQ 1C.1: Does the receipt of HCBS result in a slower deterioration of LOC score compared to receiving care in nursing homes?

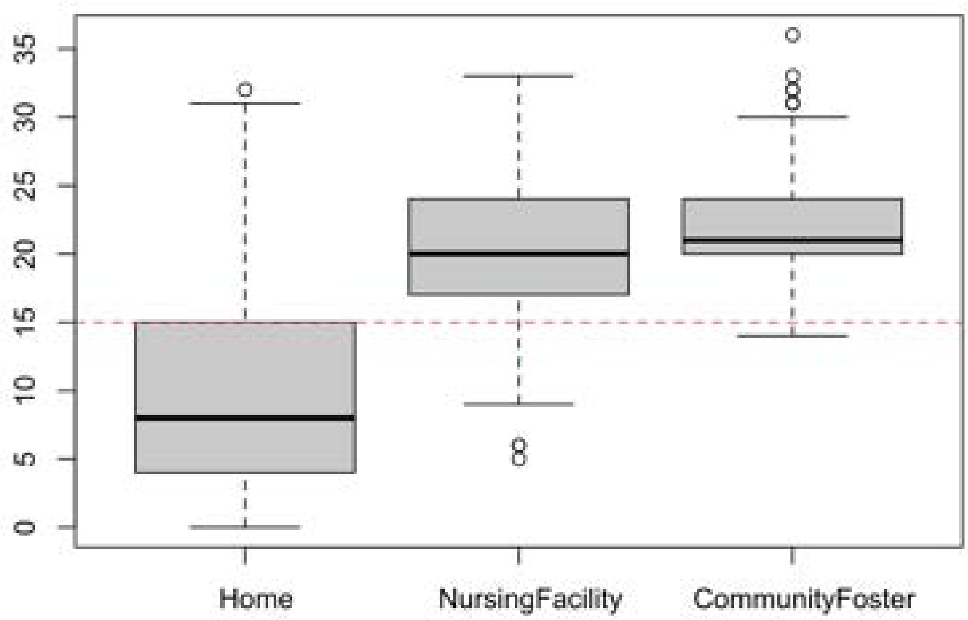
LTSS members in different settings (homes, community foster homes, and nursing facilities) had different characteristics. For example, members at home and foster homes tend to be younger, have a caregiver who is willing to provide/continue care, and have a lower percentage of mental illness as the primary or secondary diagnosis at the time of assessment compared to those in nursing homes. In terms of LOC scores of functional limitations in engaging in ADLs, members in nursing homes and foster homes had higher LOC scores compared to members living at home. This difference is also illustrated in the figure following Table V.1C.4 (see Figure V.1C.2).

Table V.1C.4. Baseline Characteristics of Longitudinal LTSS Data with 2 or More Years of Follow-up (Age 65 or Older)

	All Sample	Home	Nursing Facility	Community Foster Home	p-value
Total Sample	5,426	2,419 (44.6%)	1,798 (33.1%)	1,209 (22.3%)	
Sex					
Female	3,886 (71.6%)	1,756 (72.6%)	1,308 (72.7%)	822 (68.0%)	0.006
Male	1,540 (28.4%)	663 (27.4%)	490 (27.3%)	387 (32.0%)	
Age (years)					
Mean±SD	80.7±9.7	77.4±8.8	84.1±9.4	82.1±9.8	<0.001
Age Group					
65-74	1,753 (32.3%)	1,074 (44.4%)	354 (19.7%)	325 (26.9%)	<0.001
75-84	1,610 (29.7%)	804 (33.2%)	471 (26.2%)	335 (27.7%)	
85+	2,063 (38.0%)	541 (22.4%)	973 (54.1%)	549 (45.4%)	
LOC scores (ADL)					
Mean±SD	16.2±8.0	9.7±6.8	21.0±4.5	21.9±3.4	<0.001
LOC score categories					
0-15	2,071 (38.2%)	1,876 (77.6%)	169 (9.4%)	26 (2.2%)	<0.001
16+	3,355 (61.8%)	543 (22.4%)	1,629 (90.6%)	1,183 (97.8%)	
Social Support					
No Support	2,113 (38.9%)	497 (20.5%)	743 (41.3%)	873 (72.2%)	<0.001
Have Support	1,883 (34.7%)	1,694 (70.0%)	21 (1.2%)	168 (13.9%)	

Missing	1,430 (26.4%)	228 (9.4%)	1,034 (57.5%)	168 (13.9%)	
Mental Illness as Primary or Secondary Diagnosis					
No	5,389 (99.3%)	2,404 (99.4%)	1,779 (98.9%)	1,206 (99.8%)	0.027
Yes	37 (0.7%)	15 (0.6%)	19 (1.1%)	3 (0.2%)	
Dementia as Primary or Secondary Diagnosis					
No	5,342 (98.5%)	2,395 (99.0%)	1,743 (96.9%)	1,204 (99.6%)	<0.001
Yes	84 (1.5%)	24 (1.0%)	55 (3.1%)	5 (0.4%)	

Figure V.1C.2. Distribution of Baseline Level of Care Score (y-axis) by Setting before Matching

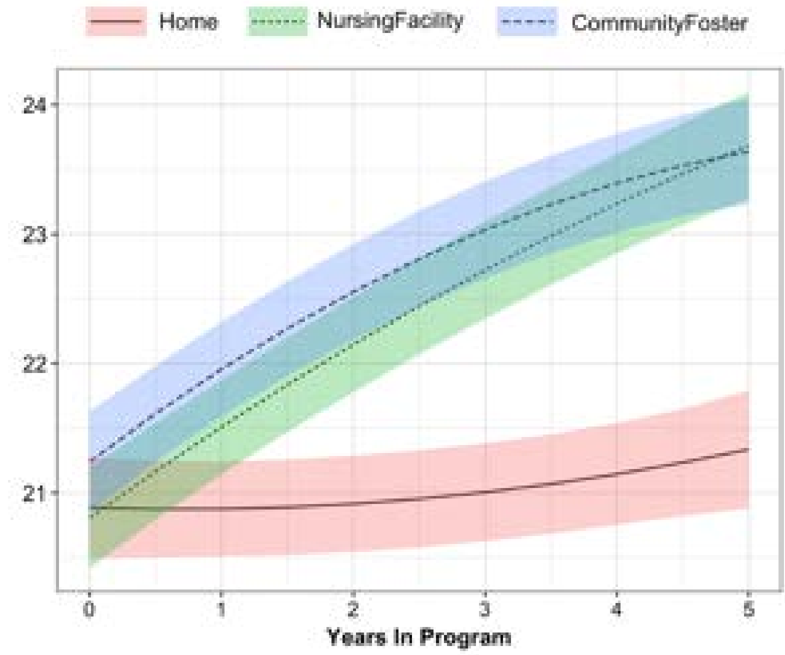


As we examined members with different levels of functional limitations by dividing the sample by LOC scores at baseline, we identified higher average LOC scores for older adults living in nursing homes and foster homes compared to those living at home Trends in functional decline over time differed by setting as well as baseline acuity. LOC scores increased gradually over time for members with low acuity (LOC scores of 15 or lower) in all settings, meaning they all experienced functional decline over time. However, there were differences in the extent to which they declined based on setting. The scores of individuals in nursing homes and foster homes were notably higher at baseline when compared to those of individuals living at home and exhibited a comparable trend over time. For members with high acuity LOC (LOC scores higher than 15), the differences in LOC scores over time were smaller based on setting.

Since the differences between settings in the baseline LOC scores of members with high acuity LOC were smaller, we focused on this sub-group to identify the extent to which provision of HCBS slows the deterioration of health (measured by LOC score) compared to those in nursing homes. Specifically, we examined three groups—individuals living at home or in a community foster home (both HCBS recipients) and those in in a nursing home. We exclusively focused on members with NF LOC, not the At-Risk population. The matched sample includes 1,077 members with 359 members in each setting. The LOC scores of members by setting after matching were similar.

We found that, among members meeting NF LOC with high LOC scores (>15 points), the LOC scores for those in the home setting were stable over the years they were in the program, whereas the LOC scores for those in the nursing home or community foster homes deteriorated over the years they stayed in the program (see Figure V.1C.3).

Figure V.1C.3. Average LOC Score by Years in Program and Setting Adjusted for Age and Sex



Both home and community foster home settings are considered community-based (HCBS settings). However, the functional decline outcomes in community foster homes were similar to nursing homes, while home settings resulted in substantially reduced functional decline over time. These trends in functional decline by setting did not differ by age group. For all older adults (i.e., 65–74, 75–84, and 85+) home settings were associated with less functional decline over time than nursing facilities or community foster homes. The trend persisted when we explored subgroup differences by primary or secondary diagnosis of dementia or mental illness. That is, members with these primary diagnoses living in nursing facilities or community foster homes deteriorated faster compared to those staying at home, and they were also less likely to be in homes settings. This suggests that there may be unique supports or protective factors within home settings that slow functional decline that are not reflected equally in a HCBS settings.

RQ 1C.2: Does length of time to enter a nursing home, patient-reported health outcomes (PROs), and total cost of care vary depending on a variety of client characteristics among individuals meeting NF LOC criteria and receiving HCBS services?

The second evaluation question addresses the subgroup differences of three outcomes—length of time to enter a nursing home, PROs, and total cost of care—with a focus on the population meeting NF LOC and receiving HCBS. We address each outcome in the following section.

Length of time to enter a nursing home

For the population with approved NF LOC at baseline, the average age was 84 years with over half being 85 or older. The majority of this population were females (72%). The average LOC score at the baseline was 19 points, indicating high acuity of functional impairments. Over half had a caregiving support system that was willing to provide/continue care. Approximately 14% had some type of mental illness as a primary or secondary diagnosis and 32% had dementia as a primary or secondary diagnosis. The average length of time before entering a nursing home was 722 days (see Table V.1C.5).

Table V.1C.5. NF LOC Population Demographics at Baseline

	N	Mean	SD
Age (all)	421	83.95	8.97
Age groups			
[65, 75)	82	20%	40%
[75, 85)	118	28%	45%
85+	221	53%	50%
Sex			
Male	116	28%	45%
Female	305	72%	45%
LOC score (ADL, [0,38])	421	18.78	3.68
Social support			
Yes	242	58%	50%
No	129	31%	46%
Unknown	50	12%	32%
Primary or Secondary Diagnosis			
Mental illness	59	14%	35%
Dementia	133	32%	47%

When we examined the number of days before entering a nursing home by demographic characteristics, we found that members aged between 65 and 75 (vs. those 85 or older), female members, and those with a caregiving support system that was willing to provide/continue care tended to have a longer time in the community setting before entering a nursing home. Members with higher LOC scores at baseline tended to have a shorter time in the community setting before they entered a nursing home (See Table V.1C.6).

Table V.1C.6. Average Number of Days before Entering a Nursing Home by Demographics of NF LOC Population at Baseline (N=421)

	Mean	SD	t	p-value
All	722.51	535.75		
Age groups				
[65, 75)	824.85	621.45	reference	
[75, 85)	706.24	554.33	-1.54	0.12
85+	693.22	487.27	-1.90	0.06
Sex				
Male	627.59	474.43	reference	
Female	758.61	553.77	2.25	0.03
LOC score (ADL)			-2.94	0.00
Social support				
Yes	883.32	567.05	reference	
No	505.34	390.55	-6.89	0.00
Unknown	504.46	424.16	-4.85	0.00
Primary or Secondary Diagnosis				
Mental illness	656.68	571.50	-1.02	0.31
Dementia	687.14	508.22	-0.92	0.36

Patient-reported outcomes (PROs)

LTSS members had two goals on average in 2021–2022, and only a small percentage (2.9%) of goals were documented as completed by the end of the observation period. As this program has an explicit emphasis on person-centered care, efforts should be directed towards enhancing the achievement of goals set by the LTSS member.

In terms of subgroup differences, we found only geographic differences in goal completion. Members in Maui County and Hawaiʻi County had higher percentages of goals that were completed compared to those in Honolulu County (5.48% in Maui County and 3.98% in Hawaiʻi County versus 1.10% in Honolulu County).

Cost of care

For individuals meeting NF LOC, the results illustrated in Figures VI.1C.4 and VI.1C.5 show that (1) Medicaid spending (in dollar amount) increased from 2016 to 2022 but the percentage of total spending paid by Medicaid was relatively stable during this period, and (2) Medicaid is the largest payer for this population. Specifically, the nominal average Medicaid spent on care increased from $65,137 per person in 2016 to $76,081 in 2022. The increase could be partly due to inflation. The percentage of total cost paid by Medicaid first increased from 80% in 2016 to 84% in 2017, and then decreased to 82% in 2022.

Figure V.1C.4. Amount Paid by Medicaid for Individuals Meeting NF LOC by Calendar Year

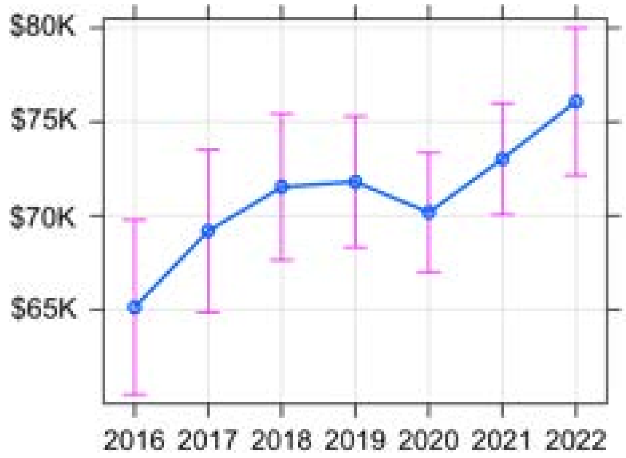
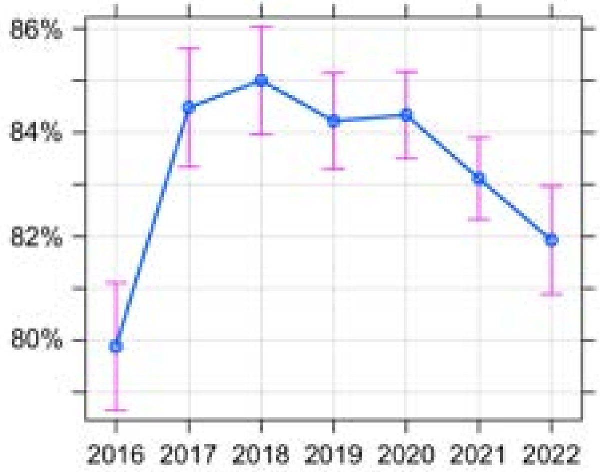


Figure V.1C.5. Percentage of Total Spending Paid by Medicaid for Individuals Meeting NF LOC by Calendar Year



In terms of subgroup differences, Medicaid paid more for individuals younger than 65 years old, especially those under 55, likely due to a lower prevalence of Medicare coverage for this group. There is an increasing trend in the Medicaid spending on younger members meeting NF LOC between 2016 and 2022 (see Figure V.1C.6). However, we did not find age differences with regard to the percentage of total spending paid by Medicaid. For sex, males had a higher average cost paid by Medicaid (see Figure V.IC.7) but we did not observe sex difference for the percentage of total spending paid by Medicaid.

Figure V.1C.6. Amount Paid by Medicaid for Individuals Meeting NF LOC by Calendar Year and Age Group

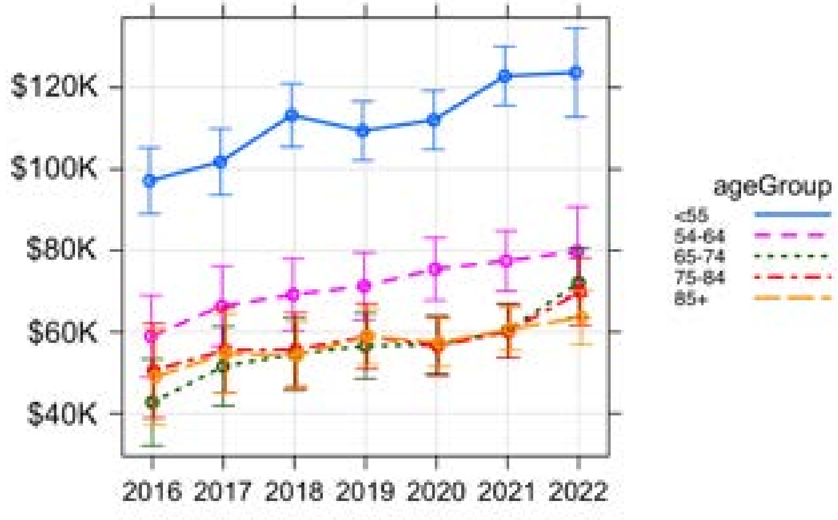
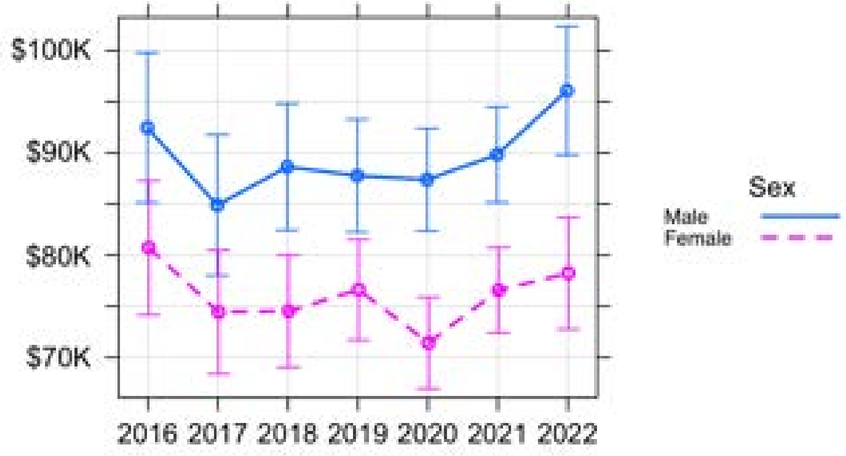


Figure V.1C.7. Amount Paid by Medicaid for Individuals Meeting NF LOC by Calendar Year and Sex



RQ 1C.3: Does length of time to enter a nursing home, PROs, and total cost of care vary depending on a variety of client characteristics among the At-Risk population?

This analysis addressed the same research question and set of outcomes as RQ 1C.2 but focused on the At-Risk population. We addressed this question by outcome as follows.

Length of time to enter a nursing home

The average age of the At-Risk population was 82 years with a majority of females (70%). The average LOC score for IADL was 7.4, which indicates much lower acuity than NF LOC, as expected. Over 60% of members had a caregiving support system that was willing to provide/continue care.

Approximately 10% had a primary or secondary diagnosis of mental illness and 22% had a primary or secondary diagnosis of dementia. (Table V.1C.7)

Table V.1C.7. At-Risk Population Demographics at Baseline

	N	Mean	SD
Age (all)	301	81.50	8.08
Age groups			
[65, 75)	72	24%	43%
[75, 85)	105	35%	48%
85+	124	41%	49%
Sex			
Male	89	30%	46%
Female	212	70%	46%
LOC score			
ADL [0,38]		6.78	3.46
IADL [0,10]		7.40	1.93
Social support			
Yes	191	64%	48%
No	71	24%	43%
Unknown	39	13%	34%
Primary or Secondary Diagnosis			
Mental illness	29	10%	30%
Dementia	66	22%	41%

On average, the length of time before entering a nursing home was 1,090 days. When we examined the length of time to enter a nursing home by member characteristics, we found that members aged 85 or older (vs. 65–75) tend to have a shorter length of time before they entered a nursing home. (See Table V.1.C.8)

Table V.1C.8. Average Number of Days before Entering a Nursing Home by Demographics of At-Risk Population at Baseline (N=301)

	Mean	SD	t	p-value
All	1,089.53	561.45		
Age groups				
[65, 75)	1,210.35	549.15	reference	
[75, 85)	1,089.91	587.50	-1.41	0.16
85+	1,022.13	538.39	-2.27	0.02
Sex				
Male	1,051.52	579.05	reference	

Female	1,107.29	554.49	0.79	0.43
LOC score				
ADL [0,38]			-2.11	0.04
IADL [0,10]			-1.50	0.14
Social support				
Yes	1,054.02	569.10	reference	
No	1,194.51	556.08	1.8	0.07
Unknown	1,082.13	522.30	0.29	0.78
Primary or Secondary Diagnosis				
Mental illness	1,005.97	616.90	-0.86	0.39
Dementia	1,009.96	576.39	-1.33	0.19

At-Risk individuals tended to have a longer length of time before they entered a nursing home compared to NF LOC population, who were also receiving HCBS, and are eligible for a broader array of services, but who have substantially higher acuity. At-Risk individuals, however, tended to be younger, less likely to have dementia, and have a lower percentage of members without a caregiving support system willing to provide/continue care.[2] These two groups are not directly comparable. While the descriptive analysis cannot conclude the effectiveness of HCBS on mitigating health deterioration to NF LOC, it establishes a baseline for Hawaiʻi's At-Risk population. Continued research is needed to conclusively demonstrate the value of providing at risk services to Medicaid members.

Patient-reported outcomes (PROs)

For PROs, we analyzed the data extract of the goal attainment status from one health plan. Among 3,127 members who stayed in the same program, with both demographic and goal attainment information in 2021–2022, 479 were At-Risk members. On average, each At-Risk member had two goals, and a small percentage (3.5%) of members had goals that were completed. Given the emphasis on person-centered care, it is essential to enhance the achievement of goals.

While there were no differences in goal completion by age, sex, and language use, we found geographic differences. Members in Maui County had a higher percentage of goals that were completed compared to Honolulu County (7.93% versus 3.10%).

Compared to LTSS members, At-Risk members in Honolulu County had a higher percentage of goals completed.

Total Cost of care

The total average spending (in dollar amount) for individuals with approved at-risk LOC was stable between 2016 and 2022. In contrast, the total spending (in dollar amount) on individuals who met NF LOC continued to rise during the same time period (see Figure V.1C.8).

The percentage of total spending paid by Medicaid for the at-risk population increased from 56% in 2016 to around 65% in 2017-2020, whereas the percentage for those meeting NF LOC was around 85%

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[2] The statistical tests were conducted with all p-values under 0.05.

in 2016-2020. The percentages for both the at-risk and NF LOC populations showed a slight downward trend between 2020 and 2022 (see Figure V.1C.9).

Figure V.1C.8. Amount paid by Medicaid by Approved LOC Status and Calendar Year

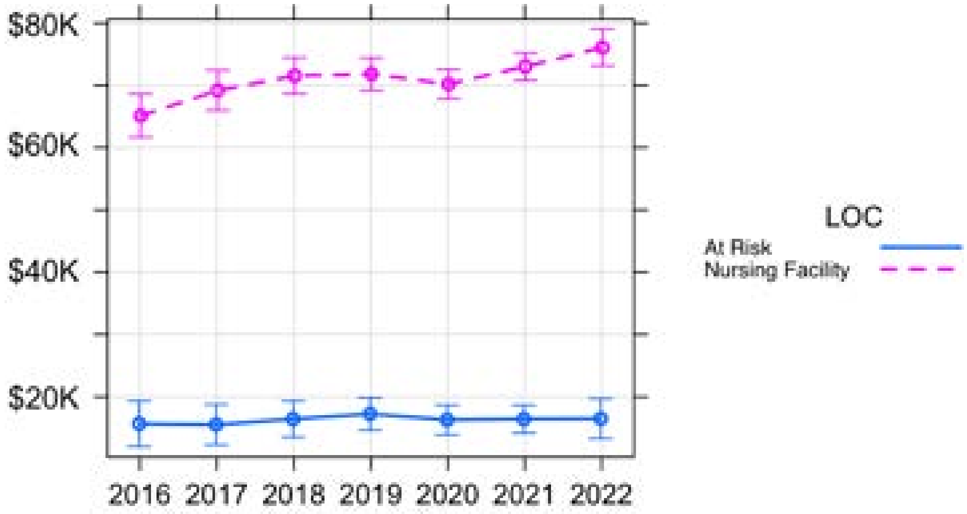
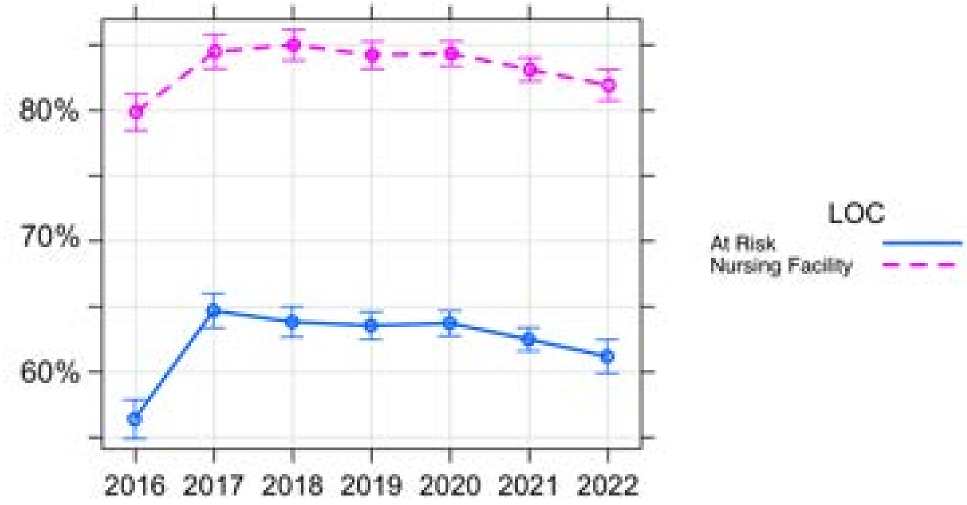


Figure V.1C.9. Percentage of Total Spending Paid by Medicaid by Approved LOC Status and Calendar Year



The above two figures consistently show that At-Risk population had lower costs compared to those meeting NF LOC. This finding is expected, as those in the latter group tend to have more LOC needs.

In terms of subgroup differences for the At-Risk population, we found that the age group under 65 years had a higher cost paid by Medicaid compared to older age groups. For example, over 70% of the total spending were paid by Medicaid for those under 65 years old, whereas the rates for those over 65 years were 40–57% (see Figure V.1C.10). This finding is not surprising as Medicare generally covers adults aged 65 years and older, with Medicaid being the payer of last resort. We observed sex difference with higher costs paid by Medicaid for males (see Figure V.1C.11).

FIGURE V.1C.10. PERCENTAGE OF TOTAL SPENDING PAID BY MEDICAID FOR THE AT-RISK POPULATION BY CALENDAR YEAR AND AGE GROUP

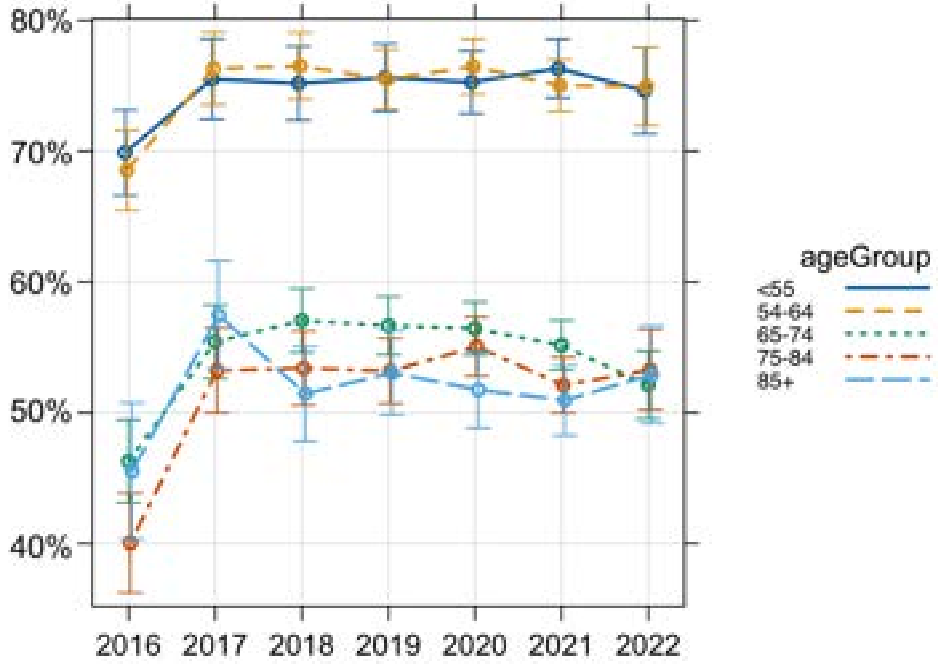
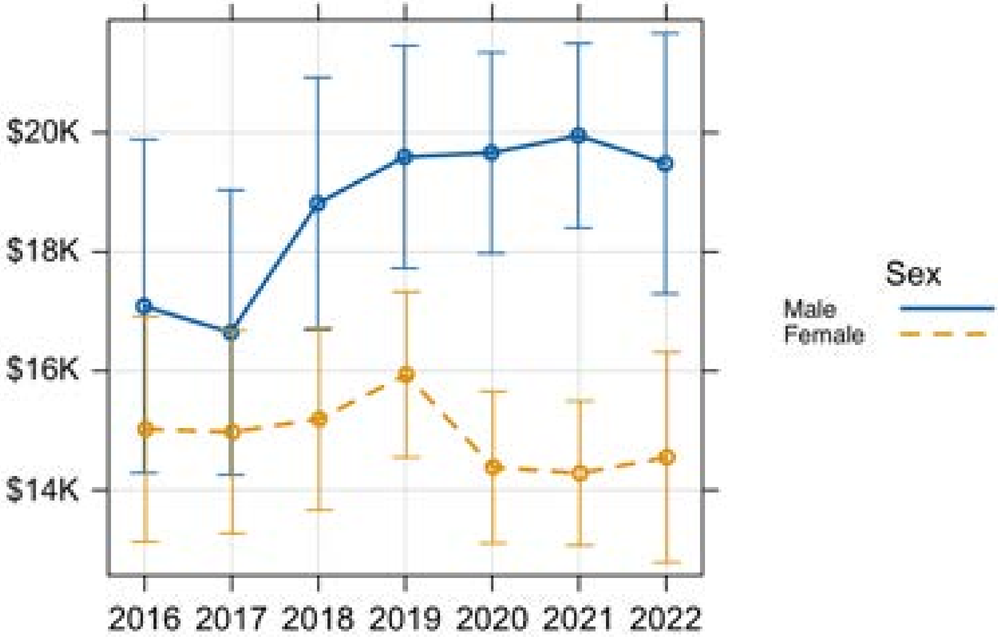


FIGURE V.1C.11. AMOUNT PAID BY MEDICAID FOR THE AT-RISK POPULATION BY CALENDAR YEAR AND SEX



Limitations

The analysis has a few limitations. For the first evaluation question, we focused on older adults who stayed in the same setting for at least two years and excluded those who switched between settings (e.g., from home to nursing home). Such exclusion may lead to bias, as individuals who stayed in the same setting may tend to have a more stable health status compared to those who changed settings (e.g., due to functional declines). Further exploration of the population experiencing changes in setting are necessary to understand the factors contributing to transitions in setting, particularly given our findings that distinct settings are associated with different outcomes. In addition, using primary or secondary diagnoses of mental illness or dementia on the LOC assessment does not capture the entire LTSS population with these conditions; an LTSS member may have mental illness or dementia which is not recorded as "primary" or indicated as such on the LOC assessment. Nevertheless, this is the diagnosis that the person scoring the assessment decides is most salient at the time of the assessment. Lastly, while the matching based on age, sex, and LOC score at baseline made the treatment and comparison groups more comparable, some characteristics of matched groups are still different. We will consider other matching variables from other data sources to expand the analysis in the future. For the second and third questions, we used goal attainment as the patient-reported outcome (PRO) with data from one health plan but we will consider other PRO measures and include all health plans as data quality and consistency are actively being improved through work by MQD and health plans.

Conclusions and Recommendations

The above findings highlight several important points about care options and outcomes for individuals with varying levels of need.

The analysis showed that receiving care at home slows functional impairment over time when compared to receiving care in foster homes or nursing homes, although both foster homes and personal homes are considered HCBS settings. This suggests that staying in a familiar environment with family, friends and known surroundings might have a positive impact on health. Our findings provide support for the effectiveness of home care and indicate that policy solutions such as support for family caregivers, training and certification of more home care providers, and personalized care plan may help optimize healthcare delivery and promote member health.

Furthermore, we found that individuals who received care at home tended to have much lower average acuity than those in foster homes or nursing homes. This, paired with the finding that home settings can be protective even for individuals with high acuity, suggests that greater efforts should be taken to support in-home care whenever possible. This may include increasing supports for family caregivers and providing more in-home caregiving support, even for high acuity members. Future research should examine reasons for the difference in placement patterns in home versus foster home settings, and potential strategies to enhance supports for in-home care for higher acuity members.

Next, while foster home residents receive care in the community, they experienced a similar pattern of functional decline as those in nursing homes. As funding shifts from institutional care to home- and community-based care, this finding calls attention to the variations in quality of care and functional status within HCBS settings; certain settings within HCBS may require targeted interventions that recognize the unique challenges and advantages associated with each type of care. By taking into account the differences in these environments, healthcare professionals can provide more effective and personalized care that aligns with the distinct needs and preferences of the individuals receiving support. Further research is warranted to discern the factors contributing to patient wellbeing, such as the level of personalized attention, medical expertise, or the specific types of care and activities provided in these settings, to inform targeted policy interventions.

One unique aspect of the Hawaiʻi's 1115 waiver demonstration is the provision of a limited set of HCBS to the population that is "at risk" of deteriorating to a nursing facility level of care. Compared to individuals who meet the Nursing Facility Level of Care (NF LOC), the At-Risk population spent longer in the community before entering a nursing home, had higher goal attainment, and lower total cost of care. These findings are consistent with, though not by themselves adequate to reach, the conclusion that the provision of "At-Risk services" is a cost-effective strategy to mitigating the deterioration of functional status to the nursing facility level of care.

This evaluation establishes a baseline for Hawaiʻi's At-Risk population; it highlights the need to explore factors contributing to the decline in functional status among populations receiving care in community foster homes. It paves the way for future monitoring of health and cost outcomes, focused on continuing to improve the quality of care and decreasing healthcare spending on Hawaiʻi's LTSS population.

Projects 2A & 2B: Value-Based Purchasing (VBP) Reimbursed at the Health Plan and Provider Levels; Alternative Payment Models (APM) at the Provider Level

Introduction and Background

Within the U.S. healthcare system, there is a current movement away from fee-for-service (FFS) payments towards a more person-centered approach with value-based purchasing (VBP). VBP aims to incentivize higher quality service, better health outcomes, and increased value of care over volume. The Centers for Medicare and Medicaid Services (CMS) has sought to transform U.S. health care to a system that rewards value and quality of services rather than incentivizes volume (Werner et al., 2021). A key part of this strategy has been shifting from FFS payments to pay structures that link provider reimbursement to improved quality and reduced costs, or in other words, VBP (Werner et al., 2021). However, adding bonuses and penalties to FFS payments is not enough to transform the healthcare system with historically high prices and inefficient processes. Therefore, CMS has also developed advanced alternative payment models (APMs) that hold providers financially accountable for the cost of care delivered to patients, as well as the quality of this care. These APMs include accountable care organizations (ACOs), episode-based payment models, Comprehensive Primary Care models, and other arrangements (Werner et al., 2021).

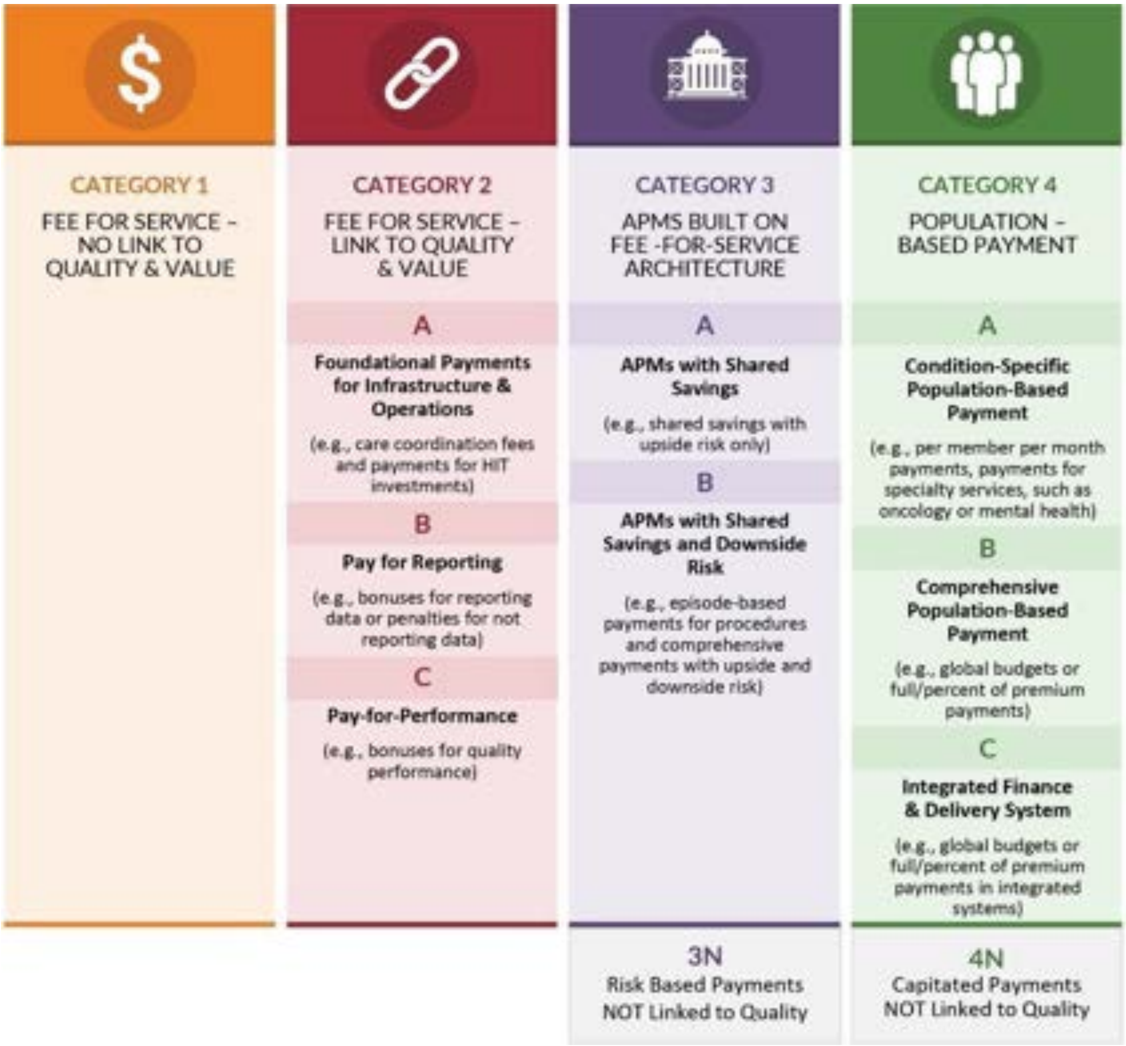
MQD aims to implement VBP strategies that incentivize quality and whole-person care through VBP-centered transformation models of payments. A VBP framework demonstrates an arrangement that holds a provider, or a managed care organization, accountable for both the costs paid and the quality of care provided (MQD, 2017). MQD supplied a VBP roadmap within the HOPE initiative that is expected to transform how healthcare is provided by implementing new models of care that strive for and drive population-based healthcare value (MQD, 2017). MQD's plans for advancing VBP in Hawaiʻi includes steps to:

- Evolve current health plan VBP requirements to reflect the Health Care Payment Learning and Action Network (HCP-LAN) APM Framework (Figure V.2.1), and require the health plans to move toward more sophisticated VBP purchasing over the life of the contract with PCPs, hospitals, specialists, LTSS providers, and other provider types;
- Evolve pay-for-performance models to reward health plans for providing high quality care and access to services and move them towards more outcome-based performance and population metrics;
- Research other managed care VBP models such as accountable care organizations, global payments, and other health models and consider the inclusion of these models within Hawaiʻi's healthcare delivery system.

Alternative Payment Model (APM) Framework

The Alternative Payment Models (APM) Framework (Figure V.2.1) is a payment model classification system developed by CMS and later modified and refined by the Health Care Payment Learning & Action Network (HCP-LAN). The classification framework allows for monitoring of progress towards person-centered care and health payment reform and away from FFS payments. This framework represents payments from public and private payers to provider organizations, which includes payments between the payment and delivery arms of health systems. It is designed to accommodate payments in multiple categories that are made by a single payer, as well as single provider organizations that receive payments in APM models across different categories involving shared financial risk and population-based payments (*Updated APM Framework*, 2017). The APM Framework establishes a common pathway for measuring and sharing successful payment models. The Framework includes the categories identified in Figure V.2.1.

Figure V.2.1. Alternative Payment Model (APM) Framework



CATEGORY 1	CATEGORY 2	CATEGORY 3	CATEGORY 4
FEE FOR SERVICE – NO LINK TO QUALITY & VALUE	FEE FOR SERVICE – LINK TO QUALITY & VALUE	APMS BUILT ON FEE -FOR-SERVICE ARCHITECTURE	POPULATION – BASED PAYMENT
	A **Foundational Payments for Infrastructure & Operations** (e.g., care coordination fees and payments for HIT investments)	A **APMs with Shared Savings** (e.g., shared savings with upside risk only)	A **Condition-Specific Population-Based Payment** (e.g., per member per month payments, payments for specialty services, such as oncology or mental health)
	B **Pay for Reporting** (e.g., bonuses for reporting data or penalties for not reporting data)	B **APMs with Shared Savings and Downside Risk** (e.g., episode-based payments for procedures and comprehensive payments with upside and downside risk)	B **Comprehensive Population-Based Payment** (e.g., global budgets or full/percent of premium payments)
	C **Pay-for-Performance** (e.g., bonuses for quality performance)		C **Integrated Finance & Delivery System** (e.g., global budgets or full/percent of premium payments in integrated systems)
		3N Risk Based Payments NOT Linked to Quality	4N Capitated Payments NOT Linked to Quality

Source: *APM FRAMEWORK. (2017). Health Care Payment Learning & Action Network. Retrieved June 20, 2023, from https://hcp-lan.org/apm-framework/*

This project aims to gather information on payment models used by MQD at the health plan level, and by health plans at the provider level, in the state of Hawaiʻi during 2020 and 2021 as reported by MQD and health plans respectively. MQD hypothesized that the adoption and use of VBP arrangements will align health plans and their providers with health system transformation objectives and lead to overall improvements in quality and outcomes, and lowered expenditures (MQD, 2017).

This evaluation serves as an initial overview of the current state of VBP arrangements and the progress made towards VBP-focused APM categories for health plans and healthcare providers in Hawaiʻi. For this evaluation, a demonstration objective, hypothesis, key evaluation projects, and two VBP project-based research questions were developed. Existing arrangements were measured at both the healthcare provider and managed care organization levels for VBP, and APMs were evaluated at the provider level.

Evaluation Approach

This project is aimed at evaluating the implementation of APM at the provider level and VBP reimbursement methodologies at the health plan level. It was hypnotized that VBP will increase appropriate utilization of the healthcare system, which in turn will reduce preventable healthcare costs.

The VBP hypothesis serves the “triple aim” of better health, better care, and sustainable costs – the primary focus of the 1115 waiver demonstration renewal, as well as a core tenet of the HOPE Initiative.

Table V.2.1. VBP Original Research Questions

RQ 2A.1: Will implementing VBP reimbursements at the health plan level result in improved health outcomes?

RQ 2A.2: Will implementing VBP reimbursements at the health plan level result in lowered utilization of the healthcare system and slower rate of expenditure growth?

RQ 2B.1: Will implementing one or more APMs at the provider-level result in improved health outcomes?

RQ 2B.2: Will implementing one or more APMs at the provider-level result in lowered utilization of the healthcare system and slower rate of expenditure growth?

In 2018, at the beginning of the evaluation period, the State began a collaborative effort with health plans to establish a reporting format for their Value-Based Care arrangements. Health plans first reported their organized VBP arrangements and the providers and members attributed to those arrangements in 2020. Attribution of a provider to an arrangement is conducted by health plans when a provider participates in an arrangement. Member attribution is generally determined by either identified claims from a provider for a specific member, or the explicit assignment of a member to a provider. Due to the COVID-19 pandemic, reporting of subsequent years 2021 and 2022 was incomplete (this evaluation was compiled during 2023). The limited availability of the data necessitated an adaption of the research questions and methodology for this evaluation.

At the time of analysis, RQ 2B.2: “Will implementing one or more APMs at the provider level result in lowered utilization of the healthcare system and slower rate of expenditure growth?” could not be assessed due to the availability of only a single year of data on implemented VBP arrangements. Any member and provider attribution over the course of multiple years therefore could not be assessed and any impact on expenditure changes could not investigated for a single year.

As reporting practices are improving, further data will be available for more detailed analyses. Future reports will be aimed at the evaluation of changes and impacts of VBP arrangements in the State over time.

Table V.2.2. VBP Amended Research Questions

RQ 2A.1: What is the extent to which VBP and APM arrangements are implemented across Hawai'i's Medicaid program?

RQ 2A.2: What is the progress of these programs towards reaching a higher category of value-based care in the APM framework?

RQ 2B.1: What is the difference in ED visits between members who are attributed to a provider participating in a VBP arrangement and those who are not?

The HOPE initiative has increased attention to VBP in Hawaiʻi's Medicaid program. Across states, vanishingly few examples demonstrate methods to monitor and evaluate VBP in alignment with the APM framework. MQD implemented a new VBP report for its health plans as part of the new managed care contract and released it in 2021. The development of the data collection tool and work with health plans to collect this data is novel and continues to be strengthened iteratively. The developmental stage of the collaboration between health plans and MQD caused some methodological and logistical limitations in assessing the effectiveness of individual arrangements reported by the health plans. This limited our ability to fully assess the originally posed research questions (Table V.2.1.) but allowed us to gain valuable descriptive insights reported within this evaluation. As such, description, commentary and narrative information was provided by health plans on the implemented VBP arrangements in 2020, as 2021 health plan reporting was not completed in time for this evaluation report.

The primary goal of the evaluation was to demonstrate the extent to which VBP and APM arrangements are implemented across Hawaiʻi's Medicaid program, as well as show the progress of these programs towards reaching a higher category of value-based care in the APM framework. Future research efforts will include assessment of health outcomes for members included in VBP arrangements.

First, this evaluation report provides descriptive information on how MQD implemented VBP methodologies at the health plan level, including: (1) descriptive information on the VBP approaches employed by MQD with its managed care health plans; and (2) evaluation of how health plans perform in accordance with these set approaches.

MQD provided information on the implemented methodology, and the calculations that form the base for its pay-for-performance (P4P) program. Additional information was derived from memos released by MQD on MQD's P4P plan and Auto-assign program to health plans (MQD memoranda CCS-2309, QI-2307, QI-2220A; and QI-2207).

Next, this evaluation report provides descriptive information on VBP arrangements with providers reported by the health plans for CY2020, including: (1) an overview of where the various arrangements are classified within the APM framework; and (2) a report of bonus payments made to providers that were involved with implemented arrangements to supply an indication of the extent and successes of value-based arrangements in Hawaiʻi.

health plans reported on their implemented alternative payment methods in CY2020, which are summarized descriptively in the section below. The descriptions of these initiatives were provided directly by the health plans; thus, some inconsistencies exist in the reporting on the arrangements and how providers attributed to each individual arrangement were determined.

To gain some insight into possible differences in health outcomes of members who were attributed to a provider we posed the following question:

What is the difference in ED visits between members who are attributed to a provider participating in a VBP arrangement and those who are not?

The count of ED visits was selected as an outcome measure as it is closely related to improved primary care and timely care, and the majority of VBP agreements reported were tied to primary care in some way.

Data sources

Health plans reported on members who were attributed to one or more VBP arrangements in 2020. Using the unique member Medicaid IDs provided, we merged this data with measurement year 2020 encounter data extracted from MQD's HPMMIS system. We did not conduct formal qualitative interviews with health plans but did collect and subsequently correspond with each health plan regarding the implementation of their program. This process was initiated through the use of summary reports that required health plans to include descriptions of the purpose and intent of Named Initiatives. Health plan responses were then reviewed by the evaluation team and the evaluation team provided feedback to the plans to clarify any questions regarding the implementation of the program based on their health plan report. Furthermore, due to the need to clarify processes and content of the implemented arrangements first with the health plans, neither providers nor patients were directly contacted in this initial evaluation at this stage of the evaluation. Qualitative work into experiences with the different arrangements is planned for future stages of the evaluation.

One health plan additionally included members who were attributed exclusively to FFS arrangements. Members from one health plan were excluded from the analyses as no data on their member attribution was provided. After matching members across data sets, we were able to derive a final dataset consisting of 287,976 unique members; this dataset was further limited to adults of 20 years and older with continuous enrollment in Medicaid in 2020 to arrive at the final dataset of 149,330 adults for analysis.

Independent variable

The independent variable used was attribution to any primary care VBP program. From the description of VBP programs provided through health plan report, we identified VBP programs aimed at primary care as indicated in Table V.2.7. We operationalized the independent variable as a dichotomous indicator (0= no attribution to a primary care provider participating in a VBP program, 1= attribution to a primary care provider participating in a VBP program).

Dependent variable

The outcome variable was the number of ED visits.

Analyses

We conducted a multivariate Poisson Regression analysis to identify differences between the two groups with regard to ED visits as outcome variable. We included sex, race/ethnicity, and age as covariates. Age was included as a continuous variable. Goodness of fit was tested using the Pearson chi-square test[3].

Results

MQD implemented three strategies to incentivize health plans to focus on improving quality and maintaining costs for their Medicaid members (1) health plan capitation; (2) The Health Plan Pay for Performance Program (P4P program); and (3) the member auto-assignment program with a quality component.

Health plan capitation payments

Contracts between MQD and the health plans are based on a capitated arrangement. Health plans are paid a PMPM rate based on patient eligibility characteristics. Since health plans are paid a set dollar amount per member, health plans benefit from reducing costs incurred per member. As such, capitated payments incentivize health plans to lower volume of care and reduce high costs services. In theory, health plans may achieve this by investing in primary care and prevention to reduce future high-cost treatments for their members. The base PMPM payment does not include quality performance measures but does include efficiency adjustments focused on quality such as assumptions that health plans will proactively address and reduce polypharmacy.

Health plan P4P program

MQD has employed a P4P program for its health plans since 2015. A withhold arrangement is implemented by MQD whereby a percent of the health plans' capitation payment is withheld by MQD. Upon meeting performance targets on selected outcome measures, health plans are able to earn back a portion or all of their withheld payment. See box V.2.1 for 2023's performance measures.

The amount that is withheld is based upon the distribution of members across major capitation groups (Family and Children, Expansion, ABD Dually Eligible, ABD – Medicaid Only) within each health plan. In 2020, $20,477,801 was withheld and available for health plans to earn back based on their performance on specific quality measures.

MQD worked with a national consultant to develop the P4P methodology. The methodology used to evaluate performance and calculate health plan earnings has evolved since 2015, but generally focused on meeting National Committee for Quality Assurance (NCQA) Quality Compass national Medicaid targets and rewarding health plans for closing gaps in performance even when targets have not been met. The most recent significant revision to methodology occurred in 2021. HEDIS measures used in the P4P program are announced to health plans prior to the beginning of the measurement year, and weights are assigned to measures varying by health plan, depending on the health plan's membership composition. As an example, measures may be weighted differently for a health plan with more children and young adults compared to one with a greater prevalence of ABD members. All HEDIS data used in P4P calculations are audited by MQD's External Quality Review Organization (EQRO). The calculation of the payout is based on the health plan's performance relative to NCQA Quality Compass benchmarks for the same measure. NCQA Medicaid Quality Compass benchmark are set nationally for HEDIS Measures. Levels are determined based on the Medicaid Population specifically.

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[3] *A Poisson regression was preferred despite high overdispersion for this report due to a large number zeros in the sample.*

Health plans are eligible to earn a portion of their withhold for a given measure if they meet at least the 25th percentile for the measure. The gap between performance on the measure between the 25th and 50th percentile is divided into thirds; and the gap between performance on the measure between the 50th and 75th percentile is divided into sixths. Taken together, the range from the 25th to 75th percentile includes ten benchmarks, and meeting each progressive benchmark earns the health plan another 10% of the withhold. Health plans that exceed the 75th percentile are eligible for bonus payments up to the maximum withheld amount. In 2023, MQD introduced a new, bonus-based P4P program for its CCS health plan based on a similar method. No performance data exists yet on the new program.

Box V.2.1. *Selected 10 performance measures in 2023*

1. Childhood Immunization Status (CIS-CH)
2. Child and Adolescent Well-Care Visits (WCV)
3. Well-Child Visits in the first thirty months of life (W30)
4. Prenatal and Postpartum Care (2017 PIP): Timeliness of Prenatal Care (PPC-AD)
5. Prenatal and Postpartum Care (2017 PIP): Postpartum Care (PPC-AD)
6. Asthma Medication Ratio (AMR)
7. Comprehensive Diabetes Care (CDC): HbA1c Control (<8%)
8. Plan All-Cause Re-Admissions (PCR-AD)
9. Follow-Up After Hospitalization for Mental Illness (FUH-AD)
10. LTSS 2 - Comprehensive Care Plan and Update

Health Plan P4P achievements

Table V.2.2. shows health plan P4P earnings between 2016 and 2020. In summary, health plans vary widely regarding meeting quality targets. For instance, in 2016, health plan 1 achieved 30.0% of total P4P awards, while health plan 3 achieved 100% of the P4P awards. By 2020, differences between health plans were markedly smaller, with health plan 1 achieving 53.5% of P4P rewards, while health plan 3 achieved 93.5% of P4P awards. On average, P4P awards increased from 46.3% in 2016, to 67.7% in 2020.

To note, over the years, some performance measures were changed, and minor methodological changes were made. Table V.2.3. indicates withhold earnings based on performance against national benchmarks which are adjusted and updated every year.

Table V.2.3. P4P Awards Achieved by Health Plans 2016–2020

	2016	2017	2018	2019	2020
	P4P award Achieved %	P4P award Achieved %	P4P award Achieved %	P4P award Achieved %	P4P award Achieved %
Health plan 1	30.0%	28.4%	33.8%	49.1%	53.5%
Health plan 2	46.9%	44.7%	51.3%	46.3%	72.3%
Health plan 3	100.0%	87.5%	100.0%	100.0%	93.5%
Health plan 4	2.6%	33.3%	39.4%	37.6%	59.7%

Health plan 5	72.6%	61.7%	55.1%	62.6%	69.3%
Total	46.3%	46.0%	51.1%	52.2%	67.7%

Note: the data in this table are derived from calculations made by MQD

New member auto-assignment program with a quality component

Every month, MQD enrolls a number of new members into Medicaid, and these new members are assigned to a health plan following a distribution algorithm. Generally, those members who were previously enrolled are re-enrolled to their prior health plan. Members with family members enrolled in Medicaid are assigned to the same plan as their family member.

All other new members are assigned a health plan by MQD's auto-assignment algorithm.

In 2020, MQD auto-assigned approximately 93,000 members.

Quality component

To incentivize health plans to improve their quality, MQD rewards health plans with a larger proportion of auto-assigned new members if they achieve higher quality metrics than the other plans.

Health plans are ranked on their performance on four selected health outcome measures. Table V.2.4 shows the measures used to evaluate auto-assignment for 2023 and the changes that will be applied for the years 2024–2026. The plan that has the highest total ranking for all measures will receive the highest overall ranking. The overall ranking is used to determine the percentage of the total quality portion of the auto-assign allocation that will be attributed to the health plan. Auto-assignment allocates 30% of new enrollees equally amongst health plans. The quality component determines 70% of the auto-assignment. Of that 70%, 40% is assigned to the first ranked plan, 30% to the second and 15% to the third, 10% to the fourth and 5% to the fifth. Adjustments are made as needed for geographic regions with fewer than five health plans operating.

Table V.2.4. Measures Used to Determine Quality Ranking Among Health Plans

Measures used in 2023	Measures to be used in 2024-2026
1. Prenatal and Postpartum Care (PPC), Timeliness of Prenatal Care 2. Follow-Up After Hospitalization for Mental Illness (FUM), within seven (7) days of discharge 3. Consumer Assessment of Healthcare Providers and Systems (CAHPS) Getting Needed Care 4. Early and Periodic Screening Diagnosis and Treatment (EPSDT) Participant Ratio	1. Child & Adolescent Well-Care Visits, Total, 3-21 years 2. Controlling High Blood Pressure, 18-64 years 3. Initiation and Engagement of Alcohol and Other Drug Use or Dependence Treatment, Engagement, Total, 18+ years 4. Screening for Depression and Follow-Up Plan, Adults, 18+ years

The quality-based auto-assignment distribution amongst health plans in 2023 is as described in Table V.2.5.

Table V.2.5. Distribution of Auto-Assignment of New Medicaid Members in 2023

Health plan Rank	% Of allocated members for 5 competing plans	% Of allocated members for 4 competing plans
1	36.0%	37.0%

2	21.0%	28.0%
2	21.0%	21.0%
4	13.0%	14.0%
5	9.0%	-
Total	100%	100%

Implemented VBP and APM Arrangements by Health Plans in CY2020

In 2020, health plans implemented a total of 18 VBP arrangements. Table V.2.6 indicates the initiatives implemented by health plan and the category of the APM Framework.

In summary, health plan 1 implemented three category 2 initiatives: rewarding achievement on select performance measures (P4P) and successful completion of reporting on other measures (Pay for Reporting (P4R)) with a bonus payment; one category 3 APM built on FFS architecture, and one initiative utilizing population-based payments in category 4. health plan 2 implemented two initiatives on level 4 of the APM framework, incorporating population-based payments. health plan 3 implemented one initiative at category 2 of the framework, providing P4R bonus payments for reporting quality measures, and one initiative using population-based payment at level 4 of the APM framework. health plan 4 implemented three initiatives using FFS incorporating a bonus for reporting and quality improvement; and two initiatives using population-based payments. Finally, health plan 5 implemented two initiatives that provided bonus payments based on quality improvements within FFS payment structures; one initiative on level 3, and one initiative applying population-based payments (see Table V.2.6).

Table V.2.6. Initiatives Conducted at Each Category of the APM Framework, 2020

	APM Category		
	2. FFS Link to Quality & Value	**3. APMs Built on FFS Architecture**	**4. Population-Based Payments**
Total number of initiatives	***n=9***	***n=2***	***n=7***
Health plan 1	3	1	1
Health plan 2			2
Health plan 3	1		1
Health plan 4	3		2
Health plan 5[a]	2	1	1

Notes: PCP = Primary Care Provider

[a] Health plan 5 reported initiatives that do not incorporate VBP methodology, but reimburse for needed care on a case bases including the: Waimanalo Health Center - Traditional Methods of Healing Program that compensates Hawaiian health methods; Hawai'i Care Choices - Palliative Care/Kupucare Program that reimburses palliative care; Paniolo Pediatrics and Family Medicine - Case Rate that reimburses EPSDT E&M codes on preventative care rates.

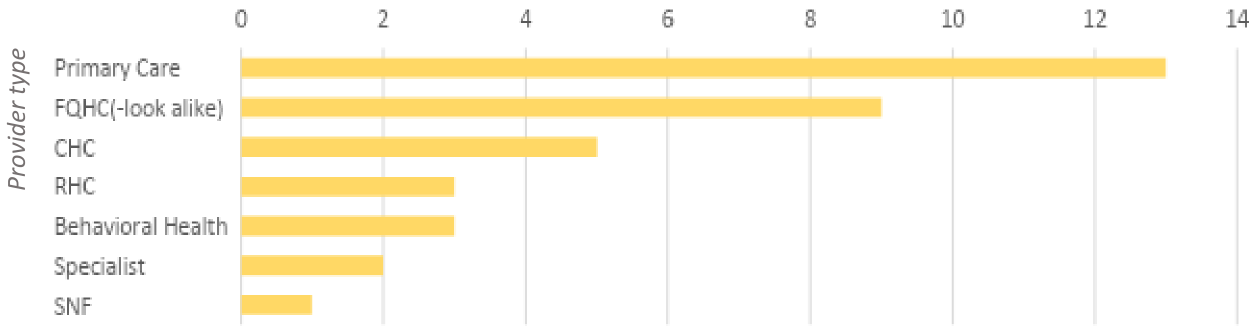
[b] Some initiatives operate multiple payment methodologies at the same time. Initiatives were organized in this framework in line with the initiative's highest qualifying level.

Providers Included in Bonus Payments

Of the 18 VBP initiatives, six were implemented for a single provider type (primary care providers) and 12 initiatives were implemented for multiple provider types. Primary care practices were most frequently targeted by health plans for implementation of VBP and AMP models, followed by FQHCs and CHCs. Figure V.2.2 illustrates the number of initiatives targeted at different provider types.

Health plans reported that a total of 1,091 providers were included in VBP and APM arrangements.

Figure V.2.2. Provider Types Targeted by Initiatives in 2020



CHC = Community Health Center, FQHC = Federally Qualified Health Center, RHC = Rural Health Center, SNF = Skilled Nursing Facility

Health plans described different levels of diffusion of their VBP arrangements. Health plan 1 included 254 unique providers participating in VBP arrangements out of 2,437 contracted providers; health plan 2 reported 648 providers to be included in VBP arrangements; health plan 4 reported 474 providers participating in VBP programs; health plan 5 included 246 out of 409 providers in VBP programs; and health plan 3 reported 4 large provider organizations to be reimbursed through VBP (no individual providers were reported for CY2020). Most plans reported information on the bonus or incentive payments to their providers for reporting or meeting quality goals.

In total, the 1,091 participating providers earned $7,097,065 in incentive payments in 2020. Table V.2.7 indicates the number of providers included VBP arrangements by health plan and paid incentive or bonus payments per health plan.

The majority of VBP arrangements were aimed at primary care providers: VBP programs in health plan 1 included 218 primary care providers; health plan 2 included 533 primary care providers; health plan 4 included 470 primary care primary care providers, and health plan 5 included 197 primary care providers. Of note, there is overlap between contracted providers across different health plans.

Table V.2.7. Number of Providers Included in Alternative Payment Methodologies and Additional Payments Made, 2020

Health plan	Number of Providers in VBP arrangements	Total Incentive or Bonuses Payments
Health plan 1	267	$3,431,484
Health plan 2	816	$2,072,161
Health plan 3	4[a]	$134,155
Health plan 4	795	$564,215
Health plan 5	280	$895,050
Total	**1091[a,b]**	**$7,097,065**

Notes: [a] Health plan 3 did not report on the total number of individual providers within the care provider organizations in CY2020. The total number of providers in VBP arrangements excludes health plan 3 providers. [b] Total number of providers accounts for overlap between providers participating with multiple health plans.

Table V.2.8 demonstrates an overview of alternative payment methods implemented by the health plan, as well as what type of payment was used, including if quality metrics were used as a basis for incentive or bonus payments. Most initiatives used selected HEDIS measures to determine any performance payments or track quality of care provision. Some initiatives that were not linked to quality did not include performance measures.

Table V.2.8. Summary of Alternative Payment Methods Key Features, 2020

	Framework level	**Name of Initiative**	**VBP Provider Type(s)**	**Payment Methodology**	**Quality Measures**
Health plan 1	2C	Pay-for-Performance	Primary Care, FQHC look- alike/RHC, Behavioral Health	FFS (PPS for FQHC look- alike/RHC)	Selected HEDIS quality measures
	3N	Risk-based Payments Not Linked to Quality	FQHC/CHC	FFS (PPS for FQHC/CHC/RHC) and upside risk pool payment.	NA
	4N	Population-based Capitated Payments Not Linked to Quality	Primary Care, Specialty	PMPM	Selected HEDIS quality measures
	2B-2C	QPP – Quality Payment Program Linked to Quality	FQHCs/CHCs	P4R; P4P	Selected HEDIS measures; SDOH and telehealth utilization reporting
	2B-2C	Special Quality Project- Follow-up After Hospitalization	Behavioral Health (specific Provider)	P4R; P4P	HEDIS FUH
Health plan 2	4A	Primary Care Payment Transformation Model	Primary Care	PMPM; P4P	Selected HEDIS quality measures
	4A	Federal Qualified Health Centers (FQHCs) and Rural Health Clinics (RHCs) Pay-for-Quality Program	FQHC/CHC/RHC	PMPM; P4P	Selected HEDIS quality measures
Health plan 3	2A	SIBRP—Skilled Nursing Facility (SNF) & Intermediate Care Facility Bonus Recognition Program	SNF	CMS PDPM (Patient Driven Payment Model)	Select reporting and quality measures
	4N	Contractual capitated payment arrangement with Hawaiʻi Permanente Medical Group ("HPMG").	Primary Care, Specialty	PMPM Capitation	Health plan foundation defined quality measures
Health plan 4	4A	FQHC Administrative Payments	FQHC/PCP	PMPM Capitation	NA
	4A	Patient Centered Medical Home payment to PCPs	PCP	PMPM Capitation	NCQA rating 1, 2, 3
	2B	SDOH Payments based on "Z" Codes on PCP claims	PCP and FQHC	P4R	NA
	2B	Continuity of Care Program	PCP and FQHC	P4R	NA
	2C	Adolescent Well Visit	PCP and FQHC	P4R	Yes
Health plan 5	3A	ACO – Accountable Care Organization	FQHC/CHC/RHC, Primary Care	Shared Savings PMPM	Selected HEDIS quality measures
	2C	Medicaid – CP PCPi	Primary Care	P4P	Selected HEDIS quality measures
	2C	Behavioral Health – Follow Up After Hospitalization (FUH)	Behavioral Health	P4P	7-day FUH
	4A	ACO – Accountable Care Organization (CIP Agreements)	FQHC/CHC/RHC, Primary Care	PMPM; P4P	NA

Notes: ACO = Accountable Care Organization, CHC = Community Health Center, HEDIS =Healthcare Effectiveness Data and Information Set, P4P = Pay for Performance, P4R = Pay for Reporting, PMPM = Per Member Per Month, FFS = Fee for Service, FQHC = Federally Qualified Health Center, FUH = Follow Up after Hospitalization, PCP = Primary Care Provider, PPS =

Prospective Payment System, QPP = Quality Payment Program, RHC = Rural Health Center, SDOH = Social Determinants of Health,

Description of Key Features Per VBP / APM Arrangement

This section summarizes the VBP arrangements implemented by the health plans are described. These summaries are distinguished by the APM categories across the five health plans.

1) APM Category 2 (Fee-for-Service – Link to Quality & Value)

Four of the five health plans included initiatives that fall under the second APM category.

Health plan 1

- Pay-for-Performance (2C): This initiative is available to primary care providers, FQHC look-alikes, RHCs and behavioral health providers. The providers involved in this arrangement receive FFS payments. In addition, they can participate in a program to receive additional bonuses for performance on meeting quality standards for selected health plan 1 beneficiaries with higher needs. Performances were rated with the following two items: (1) the NCQA HEDIS MY21 Medicaid Benchmarks and 2) the current measure period rates. The methodology was redesigned over the course of 2020, after which health plan 1 implemented a renewed VBP program with links to quality and value which it began to offer in 2021.

- Quality Payment Program (QPP) Linked to Quality (2B-2C): This program was developed in collaboration with MQD to provide supplemental financial support to FQHCs affected by pandemic-response stay-at-home orders during the months of March, April and May 2020. Performance metrics selected to determine payment included care gap closures for specific HEDIS quality metrics, SDOH reporting, and supporting telehealth capability and utilization. The program was limited to CY2020.

- Special Quality Project- Follow-up After Hospitalization for Mental Illness (FUH; 2B-2C): This pilot was implemented as a pay-for-performance program with a contracted behavioral health provider. The goal of the pilot was to improve the HEDIS measure FUH – follow-up visit within 7 days following discharge from a behavioral health acute inpatient stay. Health plan 1 noted performance increases in its FUH rate subsequent to implementing this program.

Health plan 3

- Skilled Nursing Facility & Intermediate Care Facility Bonus Recognition Program (SIBRP; 2A): Skilled Nursing Facilities (SNFs) and Intermediate Care Facilities (ICFs) supply payments to providers that accept members with challenging and complex cases. The program intends to prevent members from ending up in inpatient care. SNFs and ICFs receive a one-time incentive payment for accepting a member who does not yet have Medicaid coverage. While HEDIS and other quality metrics are tracked for the participating facilities, the payment does not depend on quality improvement. Four SNFs participated in this program.

Health plan 4

- SDOH Payments Based on "Z" Codes on PCP claims (2B): PCP and FQHC providers are provided annual payments per “Z” code per member per quarter for previous years based on an analysis of the providers’ administrative claims. This initiative therefore provides additional payments for at-risk populations through increased PMPM payments. Health plan 4 self-evaluated that the initiative had low provider participation.

- Continuity of Care Program (2B): PCP and FQHC providers are paid a bonus incentive based on each risk adjustment form completed and claims coding/payment. Health plan 4 self-evaluated that the initiative had medium provider participation. The incentive program is a pay for reporting initiative.
- Adolescent Well Visits (2C): Organizes payment for providers based on performance measures. Additionally, providers are paid based on claims, encounters, and supplemental data per member per measure closure. Health plan 4 self-evaluated the program to have medium provider participation.

Health plan 5

- Medicaid - CP PCPi (2C): A quality incentive aimed at PCPs that is based on HEDIS measures aligned with MQD’s P4P program. PCPs are eligible to receive quarterly incentive payments if they reach HEDIS quality targets. Health plan 5 identified several challenges to the achievements of targets that include: unestablished patients, lack of resources from providers, and lack of member adherence. Health plan 5 self-evaluated that the program is successful in creating partnerships with providers to achieve quality targets.

- Behavioral Health - Follow Up After Hospitalization for Mental Illness (FUH; 2C): Provides an incentive for 7-day FUH limited to Medicaid members. All PCPs are eligible for the quality incentive payment to providers based on reaching quality targets built on HEDIS measures.

2) APM Category 3 (APMs Built on Fee-For-Service Architecture)

Two of the five health plans included initiatives that fall under the third APM category.

Health plan 1

- Risk-Based Payments Not Linked to Quality (3N): Providers at FQHCs and CHCs had contracts that included a mix of PPS rates and contract-negotiated rates. Providers were paid within an upside risk sharing arrangement with no link to quality. The FQHC/CHC received a risk pool payment if its calculated medical loss ratio, after factoring in Incurred but not Reported (IBNR) payments, was not negative. The program does not include downside risk sharing. The methodology was improved over the course of 2020, after which health plan 1 implemented a renewed VBP program with links to quality and value that they started to offer in 2021.

Health plan 5

- Accountable Care Organization (ACO; 3A): A PCP-focused incentive program that bestows quarterly or yearly incentive payments to providers who participate. Providers who meet the quality measures are eligible for shared savings. The proportion paid out of the shared savings pool is made based on the extent to which quality measures are met. Payments to providers (payments to FQHCs, CHCs, RHCs, and primary care focused incentive, or payments that are quarterly or yearly) must meet a minimum of three quality measures to be eligible for shared savings pool. Shared savings pool percentage eligibility is determined by the amount of quality measures met. Health plan 5 self-evaluates that generally, the ACO program is successful in creating valuable partnerships in reducing the overall spend of ACO and focusing on the high-risk patients in efforts to reduce utilization in ED/hospitals and ensure that necessary care is provided to these patients.

3) APM Category 4 (Population-Based Payment)

Each of the five health plans included initiatives that fall under the fourth APM category.

Health Plan 1

- Population-Based Capitated Payments Not Linked to Quality (4N): The population-based, capitated payments not linked to quality reimbursed primary care and specialty providers based on a negotiated capitated PMPM rate. While the program does not include a link to quality, participating providers were also eligible for the pay-for-performance program. Only one clinic was reported to be part of the capitated arrangement at the time of reporting. This program included a comprehensive population-based payment.

Health Plan 2

- Primary Care Payment Transformation Model (4A): This program was started in 2016 and based on a value-based reimbursement model with the aim to shift from FFS to a global, monthly payment methodology. Health plan 2 reported that healthcare providers involved in the payment transformation model receive compensation based on a value-based approach, where their payments are influenced by two main factors: the quality of care they deliver and the utilization of primary care services by their patients. Additionally, physician organizations are evaluated on their capacity to effectively control the overall cost of care for each patient as well as the quality of care provided.

- Federal Qualified Health Centers (FQHCs) and Rural Health Clinics (RHCs) Pay-for-Quality Program (4A): health plan 2 has been operating a Pay for Quality program for FQHCs and RHCs since 2011. Health plan 2 reported that it is evaluating the program in collaboration with the providers to develop quality incentives that account for the services and support they provide to the community. Providers are paid a PMPM rate for engagement and quality metrics following HEDIS specifications.

Health Plan 3

- Contractual Capitated Payment Arrangement with a multispecialty group practice ("HPMG"; 4N): health plan 3 contracts with HPMG, primary care and specialty care physicians, on a capitated basis that incorporates overall quality improvement targets. HPMG providers are paid on a PMPM capitation basis. HPMG shares in potential net gains if certain quality metrics are met. This arrangement describes the general integrated payment structure operated by health plan 3.

Health Plan 4

- FQHC Administrative Payment (4A): FQHCs were paid fees in support of enhanced care coordination and EMR data integration. Payment was made on a PMPM capitation basis. One provider participated in the program at the time of reporting. The program was implemented with no link to quality.

- Patient Centered Medical Home Payment to PCPs (4A): Implemented to support primary care. PCPs are paid based on their NCQA rating. Moreover, PCPs receive a higher PMPM for opening their panels (i.e., accepting new patients).

Health Plan 5

- Accountable Care Organization (ACO; 4A): Provides a monthly PMPM payment to providers based on meeting selected ACO metrics. The ACO is evaluated through a performance score board. Providers are rated on reductions in ED and hospital utilization, reduction in avoidable ED visits, improvements in access to care, and improvements in the health of high-risk patients. The health plan stated challenges including the inclusion of unestablished patients and the lack of available resources from its ACO. The health plan found through evaluation that the ACO program was successful in creating valuable partnerships in reducing the overall spend and focusing on high-risk patients in efforts to reduce utilization of ED/hospitals and ensure that necessary care is provided to patients.

Quantitative Analyses Results

In total, 149,330 adults aged 20 and over were included in the analysis; 76.1% (n=113,629) members were attributed to a primary care provider who participated in any VBP program, and 23.9% (n= 35,701) of members were not attributed to a primary care provider in a VBP program.

Table V.2.9. Sample Characteristics

			N (Total)	**%**
VBP attribution				
Attributed to VBP provider			113629	76.1%
Not attributed to a VBP provider			35701	23.9%
	Not attributed to a VBP provider	**Attributed to VBP provider**		
Sex				
Male	43.9%	44.9%	66711	44.7%
Female	56.1%	55.1%	82589	55.3%
Not defined	0.0%	0.0%	30	0.0%
Race/Ethnicity				
Non-Hispanic White	23.2%	20.1%	31175	20.9%
American Indian/Alaskan native	2.1%	1.9%	2923	2.0%
Black	1.5%	1.8%	2643	1.8%
Chinese	8.6%	9.0%	13291	8.9%
Filipino	13.1%	17.0%	23987	16.1%
Hawaiian (include part Hawaiian)	18.6%	14.6%	23236	15.6%
Japanese	4.4%	5.6%	7943	5.3%
Other Asian	4.6%	4.8%	7115	4.8%
Other pacific islander	5.0%	5.5%	8019	5.4%
Other	9.0%	8.5%	12842	8.6%
Unspecified	9.9%	11.1%	16145	10.8%
	Mean (SD)	***Mean (SD)***		
ED visits	0.46 (1.6)	0.45 (1.5)		
	Mean (SD)	***Mean (SD)***	***Mean***	***SD***
Age	44.5 (15.1)	46.92 (17.0)	46.33	16.6

As shown in Table V.2.10, we found no difference in ED visits between members attributed to a primary care provider who participated in a VBP arrangement when adjusted for age, sex and race/ethnicity (p =

0.78, CI 0.39–0.41). Goodness of fit tests (Pearson chi-square) indicated an overdispersion of the sample, affecting the confidence in the outcomes of this analysis.

Table V.2.10. Poisson Regression VBP Attribution Associated with ED Visits

	B	SE	p-value	Exp(B)	95% CI
VBP attribution					
Attributed to VBP primary care provider (reference)					
Not attributed to a VBP primary care provider	0.00	0.01	0.78	1.00	(0.98, 1.02)
Sex					
Male (reference)					
Female	-0.03	0.01	0.00	0.96	(0.96, 0.99)
Not defined	-2.48	1.00	0.01	0.08	(0.01, 0.59)
Race/Ethnicity					
Non-Hispanic White (reference)					
American Indian/Alaskan native	0.22	0.03	0.00	1.25	(1.19, 1.31)
Black	0.43	0.02	0.00	1.54	(1.47, 1.61)
Chinese	-0.39	0.02	0.00	0.67	(0.65, 0.70)
Filipino	-0.28	0.01	0.00	0.76	(0.74, 0.78)
Hawaiian (include part Hawaiian)	0.18	0.01	0.00	1.19	(1.17, 1.22)
Japanese	-0.23	0.02	0.00	0.80	(0.77, 0.83)
Other Asian	-0.62	0.02	0.00	0.54	(0.51, 0.56)
Other pacific islander	0.27	0.02	0.00	1.32	(1.27, 1.36)
Other	-0.08	0.02	0.00	0.92	(0.89, 0.95)
Unspecified	-0.29	0.02	0.00	0.74	(0.72, 0.77)
Age	0.00	0.00	0.00	1.00	(1.00, 1.01)

Conclusions and Recommendations

MQD employs multiple methods to achieve improved attention to quality outcomes for its Medicaid population. These methods include VBP programs implemented by MQD as well as those implemented by health plans. We found that health plans are performing increasingly well with regard to MQD's P4P program. Whereas in 2016 health plans had an average achievement level of 46.3%, their P4P performance increased to 67.7% in 2019, 87.4% in 2020, and 63.5% in 2021. It should be noted that the high level of achievement in 2020 may be attributed to some ad-hoc adjustments MQD implemented to the program during the first year of the pandemic. It is encouraging that health plans seem to have increasingly high levels of achievement, given that their performance is assessed in comparison to national benchmarks. In theory, these higher levels of achievement reflect improved performance by providers and improved health outcomes for participating members. However, P4P performance should be interpreted with caution. The influx of new members during the course of the COVID-19 pandemic with less complex health issues and generally higher health outcome levels may have impacted the average improvement in health outcomes and thus the achievement on the P4P measures. Moreover, it should be noted that the changes in improvement are relative to the national Medicaid benchmark, and do not represent absolute improvements in health outcomes for Medicaid members.

Beyond MQD's P4P programs, health plans have several programs in place aimed at improving health outcomes in line with MQD intentions. We found that most health plans still focus on VBP arrangements that are based on an FFS payment structure, with only two initiatives incorporating risk-based payments. The programs vary widely in scope, structure, and covered provider/member populations, making them difficult to evaluate as a whole. Seven arrangements include population-based payments, specifically including PMPM payments. Other, population-based arrangements are generally aimed at adding additional payments for at-risk populations on top of the prevailing reimbursement model, and do not fully integrate population payments for the full patient population. Health plan 1's Population-based Capitated Payments Not Linked to Quality initiative includes a global capitation payment for the entire provider population; however, only one provider is included in this program. On the other hand, health plan 3’s contractual capitated payment arrangement with a large group practice includes all provider types.

Our quantitative analyses indicate no difference exists in ED visits among adult members who are attributed to a primary care provider who participates in a VBP program versus members who are attributed to providers who do not participate in a VBP program. However, these findings are not surprising because the underlying VBP arrangements comprising our composite variable are diverse, non-comparable, and plausibly very different in their individual effectiveness. VBP programs across health plans may vary widely and focus on different health outcome measures. Some may be effective in improving a different specific health outcome (such as a follow up after hospitalization for mental illness, or depression screening), rather than result in a reduction of ED visits, which is an overarching outcome metric for primary care that may not be the target of the VBP program. Additionally, this analysis is limited to CY2020 data; therefore, this report represents a single snapshot of VBP arrangements focused on a highly atypical year, during which the world experienced a global pandemic. Moreover, the sample was strongly overdispersed, reducing the strength of the outcomes. Future evaluation efforts will need to utilize VBP reports from additional calendar years to provide trends and longitudinal analysis of VBP arrangements and spending. The current analyses were conducted to encourage further, more detailed investigation into the effects of VBP programs, parsing specific programs and arrangements and looking at differentiating factors within each initiative.

Our descriptive results consequently indicate there is opportunity to further implement APMs with novel payment methodologies. MQD’s intention to shift payment methodology to a model with increased risk sharing is still in its early stages. Currently, limited evidence is available on the effectiveness of the implemented models in Hawaiʻi and their potential to increase quality and decrease costs. Moreover, pilots that expand PMPM payment models to cover the full population attributed to a provider, rather than a limited PMPM payment for specific patient populations, would provide further clarity on how to expand APMs for increasingly large population groups. Increased implementation of VBP or APM models will need to take into account any barriers experienced both by providers and health plans in Hawaiʻi.

The transition from traditional FFS focused on volume to a focus on value comes with barriers that impede and hinder implementation. Several challenges can be identified in the literature, including (1) lack of (data) system integration; (2) outdated practice workflows; (3) limited internal resources; (4) trouble attaining buy-in; (5) fragmented care delivery; (6) inaccessible clinical data; (7) elevated financial risk, and (8) changing policies and programs (Bartlett 2021, Agilon Health, 2022). Many of these difficulties may be framed as technology-facilitated barriers to successful implementation (Bartlett, 2021). Furthermore, McNulty (2023) discussed attribution as a challenge that arises in VBP. Patients are often attributed to a single provider to simplify reimbursement procedures; however, actual attribution has subjective aspects, as a patient may see multiple providers within a year, potentially confounding reimbursements (McNulty, 2023). McNulty proposes that patient assignment versus attribution may provide a more clear-cut path for contractual purposes and barriers to this problem with VBP, as patients select a PCP versus being assigned to a PCP by some established method (McNulty, 2023).

Hawaiʻi's provider shortage, discussed in several sections above, is ongoing, and the limited capacity of providers to implement new forms of quality reporting and improvements must be considered in communication between MQD, health plans and providers. In a recent systematic review of VBP arrangements in the US published by Pandey et al. (2023), researchers found that higher intensity programs (those combining both non-financial and financial incentives, and involved risk sharing) resulted in higher quality improvements, whereas voluntary participation of providers in lower intensity programs (those programs that did not include a multitude of measures and risk sharing) was more prevalent (Pandey et al., 2023).

When taking steps towards higher intensity VBP structures, barriers to providers need to be carefully considered by MQD and health plans. In July 2020, only 24 VBP programs in the US were evaluated and published in scientific-peer reviewed journals of which two were Medicaid-based VBP arrangements (Pandey et al. 2023). This indicates a knowledge gap in terms of how to best structure VBP models for Medicaid populations. Given the shortage of evidence-based models, the opportunity for MQD and health plans to further investigate, develop, and refine existing arrangements may also provide fertile ground to innovate and adapt arrangements to best fit the needs of Hawaiʻi's Medicaid members.

MQD is currently focused on promoting primary care and increasing the provision of high value primary care services. This is in line with the priorities of VBP arrangements implemented by health plans, as the majority of VBP and APM arrangements focus on PCPs and FQHCs.

health plans reported that increasing VBP arrangements in the realm of primary care was their main method of increasing high value primary care services. A total of 1,019 primary care providers were reported to be part of an arrangement in 2020 (not considering health plan 3's providers).

MQD encourages health plans to tie health plan P4P program measures to provider-based VBP models and initiatives. As evaluators, we were unable to study the alignment between the health plan P4P program and the health plan VBP models at this time. Therefore, we plan to investigate how MQD's quality programs currently overlap with how health plans structure and implement their own VBP programs to determine if aligned initiatives result in greater impacts on quality as compared to unaligned initiatives. We recommend that health plans evaluate their arrangements in collaboration with MQD to test the benefits and challenges of each program, and how any such arrangements contribute to MQD's overall goal of improving quality while reducing costs. Given the novelty of this area, MQD may also benefit by establishing learning communities where health plans collaborate to build stronger VBP programs that leverage the strengths of specific programs, and seek to identify and eliminate weaknesses through shared learning.

Lessons Learned and Future Recommendations

It is clear that more insight is needed in regard to the VBP arrangements health plans have implemented. The evaluation team has reached out in coordination with MQD to schedule interviews and focused case studies to learn more about VBP arrangements and initiatives health plans have established, as well as successes and challenges to these arrangements and implementation. Currently, we have met briefly with one health plan and are scheduling a meeting to further discuss their VBP arrangements. An interview guide has been created by the evaluation team to serve as a framework for a semi-structured interview with all of the health plans. A more in-depth qualitative analysis may shed light on what has worked within these arrangements and create a framework for future VBP collaborations. The utilization of additional years of VBP data from health plans and qualitative insight into these arrangements from health plans will strengthen future VBP evaluations.

Project 3A: Community Integration Services (CIS)

Introduction and Background

To meet HOPE Initiative Objective 3, “support strategies and interventions targeting the social determinants of health,” MQD developed Community Integration Services (CIS). CIS is a program including outreach, pre-tenancy supports and tenancy sustaining services for members who meet health needs-based criteria and who are experiencing homelessness or are at risk for experiencing homelessness (See Table V.3A.1). Research shows that people who experience homelessness and housing insecurity have worse health outcomes compared to the general population (Stahre et al., 2015). Not only does homelessness exacerbate existing chronic physical and mental health conditions (Elder & King, 2019; Nikoo et al., 2014), it also is also associated with an elevated risk of mortality (Gambatese et al., 2013). Individuals experiencing homelessness are frequent patients in emergency departments and often require inpatient stays and continued care upon release (Thompson et al., 2019; Thompson et al., 2021). Studies have shown that people who experience chronic homelessness (i.e., people with disabling health conditions who experience homelessness for long periods of time or repeatedly) have disproportionately high annual health care costs due to their extensive use of hospital facilities and emergency departments (Thompson et al., 2019; Thompson et al., 2021).

Table V.3A.1. CIS Eligibility Criteria

CIS Eligibility Criteria per Med-QUEST Memo QI-2105_CCS-2102

Members shall be eligible for CIS if they have:
1. At least one health need:
- *Mental health need*: presence of a serious mental illness
- *Substance use need*: has need for outpatient day treatment for substance use disorder (SUD) and was assessed to meet American Society for Addiction Medicine (ASAM) level 2.1
- *Complex physical health need*: a long continuing or indefinite physical condition requiring improvement, stabilization, or prevention of deterioration of functioning (including the ability to live independently without support)

AND

2. At least one homelessness or homelessness risk factor:
- *loss of residence*
    - homeless (i.e., lacking a fixed, regular, and adequate nighttime residence)
    - at-risk for homelessness
        - written notification that residence will be lost within 21 days of the date of application for assistance; **and**
        - no subsequent residence has been identified; **and**
        - the individual does not have sufficient resources or support networks (e.g., family, friends, faith-based or other social networks) immediately available
- history of frequent or lengthy *institutional stays and/or history of homelessness*
    - two or more instances of homelessness in the past 12 months **OR**
    - one or more institutional stays that have lasted 60 days or more and member is transitioning out without a residence

(Memo QI-2105_CCS-2102)

In recognizing that housing is health care, MQD hopes to improve member health and decrease costs by addressing housing concerns through Medicaid supported housing services. When stably housed, people are able to engage in preventative care, to store medicine properly, and to find comfort in a safe and clean environment (Lozier, 2019). In particular, through housing, CIS aims to (1) improve the health care status of beneficiaries; (2) minimize administrative burden by streamlining access to care for enrollees with changing health status; (3) promote independence and choice among beneficiaries to ensure appropriate utilization of the healthcare system; and (4) slow the rate of expenditure in managed care by decreasing utilization of acute services (emergency and inpatient utilization), increasing engagement in outpatient care services, and decreasing the total cost of care for CIS members.

To reach these aims, CIS includes services that help members (re)connect to housing and healthcare systems, to coordinate care for members with complex health needs, and to help members find stable housing. Billable support services during the evaluation period included:

- Outreach;
- Housing supports;
- Medical re-engagement and care coordination supports;
- QUEST (i.e., Medicaid) and other DOH program referral supports;
- Safety supports;
- Supports to address social risk factors;
- Financial assistance supports;
- Employment and housing readiness supports;
- Reassessment and plan revision;
- Other services;
- Case management; and
- Other supports not identified elsewhere.

In 2022, Hawai‘i was one of 29 states that offered Medicaid-supported housing services (CSH, 2022).

A. Local Context: Hawai‘i’s Homelessness and Homelessness Service System

For the last decade, Hawai‘i has reported one of the highest homelessness rates in the US. In 2022, Hawai‘i ranked 4th behind California, Vermont, and Oregon in percent of the population experiencing homelessness, with 41.4 people per 100,000 experiencing homelessness statewide (USHUD, 2022). On a given night in January 2023, 6,223 people were experiencing homelessness in Hawai‘i, and 12,855 people accessed homelessness services in 2022 on O‘ahu alone (Ka Mana O Na Helu, 2023; PIC, 2023). On O‘ahu, the numbers of unsheltered individuals (i.e., individuals not staying in emergency shelters or transitional housing), individuals over 60 years, and individuals with mental and physical health disabilities have been rising steadily since 2015 (PIC, 2023). These are populations likely to use the emergency department and to have complex health needs and for whom traditional shelters may be inappropriate.

Homelessness services in the State of Hawai‘i are coordinated by two Continua of Care organizations, Partners in Care for Honolulu County (O‘ahu) and Bridging the Gap for Kaua‘i, Maui, and Hawai‘i Counties. These collaboratives manage the Coordinated Entry Systems (CES), the Homelessness Management Information Systems (HMIS), and federal funding for their respective islands. Additionally, the State has two offices dedicated to homelessness. The State of Hawai‘i Homeless Programs Office (HPO) provides housing services and oversees state as well as some federal housing programs. The Statewide Office on Homelessness and Housing Solutions (OHHS) works with the Governor and his cabinet to develop housing policies and programs. It also coordinates the Hawai‘i Interagency Council on

Homelessness, which is the statewide homelessness planning and policy development council. These entities work together to coordinate services and to distribute funding to address homelessness in Hawaiʻi.

Direct services and housing for people experiencing homelessness or housing insecurity are typically provided by homeless service provider agencies. The state has over 50 homeless service providers (HSPs) on Oʻahu and over 20 on neighboring islands (State of Hawaiʻi HPO, n.d.). Many HSPs are small agencies that work collaboratively with each other and other social services agencies to meet client needs. CES refers people in need of housing services to HSPs. These “clients” are prioritized for housing programs based on their vulnerability assessed using the Vulnerability Index – Service Prioritization Decision Tool (VI-SPDAT) and placed on a “by name list”. Those clients who score higher on the VI-SPDAT are placed higher on the list and prioritized for permanent supportive housing (PSH; i.e., programs that provide both a voucher for independent housing and intensive case management). On the other hand, those clients who score lower on the VI-SPDAT are placed lower on the list and are prioritized for less intensive services (e.g., rapid rehousing programs that provide short-term rental assistance but minimal or no case management). However, in practice, clients high on the list often receive less-intensive services due to lack of resources and limited space in PSH programs.

In recent years, HSPs have voiced concerns over lack of capacity to serve medically vulnerable clients, who often score highly on the VI-SPDAT and are prioritized for permanent supportive housing but are unable to live independently. They also struggle to care for high needs clients who qualify for permanent supportive housing but receive less-intensive services due to needs outweighing available resources. Similarly, medical providers have voiced concerns about treating patients with homeless histories (Terrell, 2023).

B. CIS Pilot

In 2021, MQD collaborated with the five health plans and the two largest homelessness service agencies in the state to implement a pilot CIS program to serve members with complex health and housing needs. These agencies agreed to accept 20 members from each health plan, with a total of 60 members per provider enrolled at any one time. An internal MQD team met weekly to discuss the pilot for the first half of the pilot year. Additionally, the health plans met with the MQD team and participating pilot agencies regularly to assess what was working and what, if anything, needed to be adapted in order for the program to succeed. The intention was to create a “best practices” guide based on lessons learned during this pilot in order to help with a smooth transition into use by other HSPs. To our knowledge, this manual was not created, and meetings ceased in mid-2022. The evaluation team assembled providers from participating agencies to subsequent rapid-cycle assessment (RCA) meetings (discussed below) to present findings from their projects. HSP participation in RCAs allowed HSPs to receive updates on program policies and reporting and to inform MQD and health plans about implementation challenges and successes on the ground. The two homelessness service agencies continued to provide CIS services beyond the pilot period and had served the majority of enrolled CIS members as of March 2023.

Evaluation Approach

Due to the novelty of the program, the CIS evaluation focused on both process (formative) and outcomes (summative). The evaluation team worked with MQD to develop a logic model that reflected the intended program design, which was then used to guide the CIS portion of the 1115 waiver

Evaluation. The team also employed an RCA approach to understand the program's process and to provide feedback and course correction in real time.

Quarterly Rapid-Cycle Assessments

In addition to the overall evaluation, the evaluation team conducted quarterly RCAs beginning in July 2021. RCA is an evaluation approach that increases the speed of data collection and feedback to stakeholders to enable quicker turnaround from research for scaling, improving, or implementing programs (Vindrola-Padroset al., 2021). This approach allows for iterative refinement of the program and is particularly useful when implementing a new and innovative program like CIS (Riley et al, 2013; Vindrola-Padroset al., 2021). RCAs emphasize partnerships between researchers, funders, government agencies, and community partners to encourage practical, timely, and appropriate research questions that can be adapted as the program and context changes. In this sense, evaluators can be thought of as "part of the solution" and partners in the process rather than as separate entities focused solely on outcomes at the end of the evaluation period (Riley et al 2013; Shrank et al., 2013).

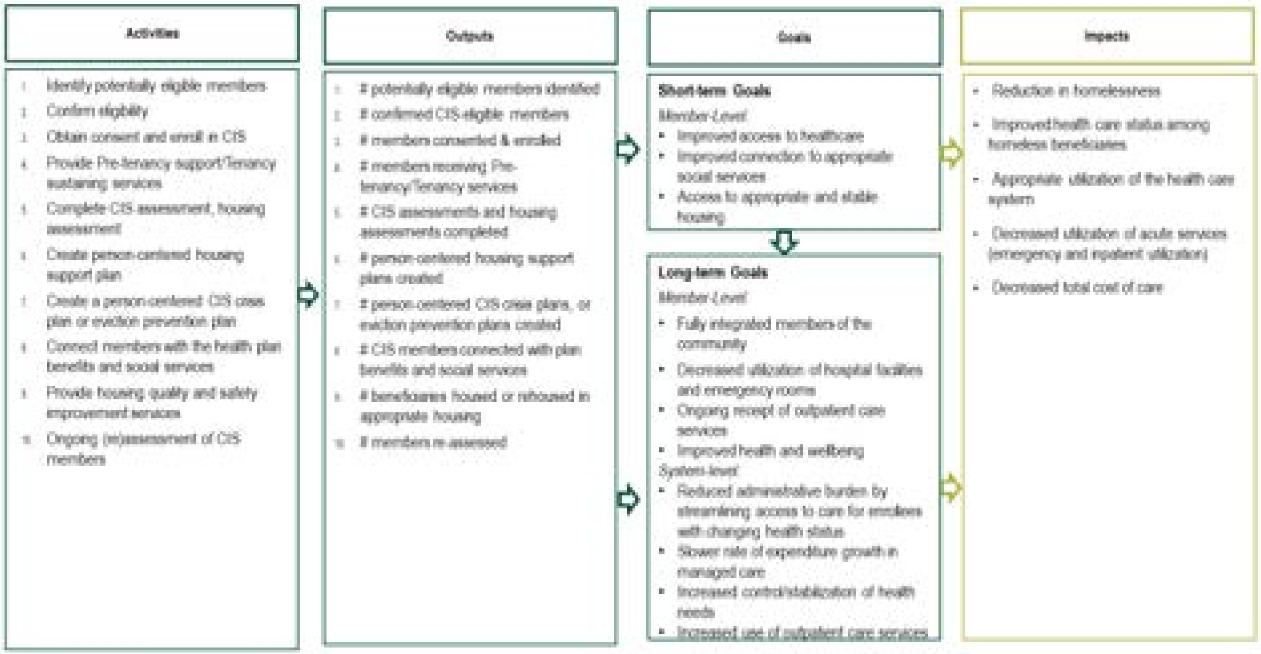
CIS is the first program to implement RCAs as a mechanism for continuous quality improvement at MQD. To facilitate this process, the evaluation team held quarterly meetings with health plans, HSPs and MQD. These meetings were used to present RCA findings and to brainstorm solutions to emerging issues. RCAs primarily consisted of analysis of data from quarterly health plan reports. Occasionally, the due dates for quarterly submissions were deferred to allow for implementing memo updates or new reporting templates. In these cases, the evaluation team focused on other areas of the current implementation that could be useful to health plans or MQD, including review of the CIS logic model, summary of qualitative interviews with health plans on implementation, contextualizing homelessness in Hawaiʻi, and sharing lessons learned from other states with similar programs. Additionally, HSPs contracted with the CIS program were invited to attend RCA meetings to share their on-the-ground experience and expertise when relevant. Each presentation was followed by an RCA report to MQD that summarized RCA findings and information shared and discussed at the RCA meeting.

While the goal of RCAs is to implement change much faster than a typical summative evaluation, RCAs must balance speed and quality in order to be effective for real-time program improvement. This balance proved difficult at times for the evaluation team. Reporting delays meant that data may not have been ready in advance of RCA meetings. Additionally, data quality was a consistent issue throughout the waiver period. A rapid approach to evaluation does not always align with a system that is impervious to quick change. For example, once a necessary change is identified, a new memo must be drafted, after which health plans have 90 days to make the change. In practice, even small changes can take up to a year to implement. Despite these challenges, the RCA has resulted in program improvement and increased collaboration among all stakeholders, discussed below.

Logic Model

RCAs and the evaluation were guided by a logic model developed in collaboration with MQD (Figure V.3A.1). The logic model details CIS intended activities, outputs, goals, and impacts and demonstrates the expected logic between these activities and impacts. For example, outputs measure if program activities occurred, and these activities (e.g., pre-tenancy services) if performed are expected to lead to short-term goals (e.g., increased access to housing), which in turn lead to long-term goals (e.g., improved health and wellbeing) that collectively lead to impacts (e.g., reduced utilization of acute services and total cost of care). This evaluation examined outputs to determine if CIS activities were being implemented and if they were being implemented as planned. It also examined progress towards goals (i.e., were activities associated with intended outcomes). The evaluation team used multiple data sources to assess outputs and progress towards goals, including quarterly reports from health plans, interviews with health plans and HSPs, and administrative data. Interviews, in particular, were useful for understanding outputs and challenges related to program implementation (activities and outputs).

Figure V 3A.1. Community Integration Services Logic Model



Activities

1. Identify potentially eligible members
2. Confirm eligibility
3. Obtain consent and enroll in CIS
4. Provide Pre-tenancy support/Tenancy sustaining services
5. Complete CIS assessment, housing assessment
6. Create person-centered housing support plan
7. Create a person-centered CIS crisis plan or eviction prevention plan
8. Connect members with the health plan benefits and social services
9. Provide housing quality and safety improvement services
10. Ongoing (re)assessment of CIS members

Outputs

1. # potentially eligible members identified
2. # confirmed CIS eligible members
3. # members consented & enrolled
4. # members receiving Pre-tenancy/Tenancy services
5. # CIS assessments and housing assessments completed
6. # person-centered housing support plans created
7. # person-centered CIS crisis plans, or eviction prevention plans created
8. # CIS members connected with plan benefits and social services
9. # beneficiaries housed or rehoused in appropriate housing
10. # members re-assessed

Goals

Short-term Goals

Member-Level

- Improved access to healthcare
- Improved connection to appropriate social services
- Access to appropriate and stable housing

Long-term Goals

Member-Level

- Fully integrated members of the community
- Decreased utilization of hospital facilities and emergency rooms
- Ongoing receipt of outpatient care services
- Improved health and wellbeing

System-level

- Reduced administrative burden by streamlining access to care for enrollees with changing health status
- Slower rate of expenditure growth in managed care
- Increased control/stabilization of health needs
- Increased use of outpatient care services

Impacts

- Reduction in homelessness
- Improved health care status among homeless beneficiaries
- Appropriate utilization of the health care system
- Decreased utilization of acute services (emergency and inpatient utilization)
- Decreased total cost of care

Evaluation Questions

Initial research questions from the evaluation proposal primarily focused on assessing long-term goals and impacts (Table V.3A.2). These questions assumed that program activities would be completed as planned, that short-term goals would be reached, that members would be stably housed while in the program, and long-term outcomes would be achieved within the demonstration period. However, the evaluation team could not rely on these assumptions for several reasons. First, poor data quality during much of the evaluation period made it difficult to track program activities (e.g., how many people received services) and to determine who, if anyone, had been housed or the current housing status of CIS members.

Table V.3A.2. CIS Original Research Questions

RQ 3A.1: Do program participants who are stably housed decrease utilization of acute services (emergency and inpatient utilization)?
RQ 3A.2: Do program participants who are stably housed increase utilization of outpatient care services?
RQ 3A.3: Is total cost of care lower for participants who are stably housed?
RQ 3A.4: Does individual health and wellbeing improve as participants' progress through the program?
RQ 3A.5: How does program effectiveness vary by client needs and experiences?

Additionally, implementation challenges led to necessary changes in program design and delays in implementation that hindered the ability to assess long-term goals and impacts. For example, the vast number of members who received tenancy or pre-tenancy services did not enroll in CIS until 2022, meaning that at the time of the writing of this report, few members could have been housed for a long enough period of time to be considered "stably housed"—a concept that was not defined or tracked. Therefore, the evaluation team amended research questions to match the program's stage of implementation and to account for available data (see Table V.3A.3). These questions focused primarily on program process (i.e., activities and outputs) and short-term goals (e.g., housing) that precede long-term impacts (e.g., lower health care costs). A focus on process is an appropriate evaluation approach for a program at this stage of implementation; however, the evaluation team aims to answer original evaluation questions in future demonstration periods as the CIS program matures and members are stably housed for longer periods of time.

Table V.3A.3. CIS Amended Research Questions

RQ 3A.1 amended: Is CIS operating as intended?
RQ3A.2 amended: Is CIS reaching the intended population (e.g., high utilizers of emergency services, members with high total cost of care, members with physical and mental health needs, and members experiencing homelessness or who are at-risk for homelessness)?
RQ3A.3 amended: How are members who received CIS tenancy and pre-tenancy different from those identified for CIS but who do not receive services?
RQ3A.4 amended: Do CIS members who receive services achieve housing stability?

Evaluation Methods

Data Sources

To examine these amended questions, the evaluation team used multiple data sources, including qualitative and quantitative data. Quantitative data included:

- member level data submitted quarterly by health plans, including housing assessment and re-assessment data not captured by other traditional systems;
- archival data, and homelessness services data–including program data from providers and Homeless Management Information System Data (HMIS);
- data submitted to MQD's HPMMIS system showing the status of each member within the program and any relevant status changes ("H Codes");
- Raw, unformatted data ("data dumps") of any and all data collected from health plans on 1115 waiver programs;
- administrative encounter data from MQD's HPMMIS system; and
- quality measures.

Qualitative data included interviews with health plans and homeless service providers, participant observations of meetings, and qualitative responses in the quarterly health plan reports. These data provided important context for quantitative data and allowed for deeper insight into the program process. The evaluation relied most heavily on H Code and encounter data, which are described in more detail below.

H Code Data

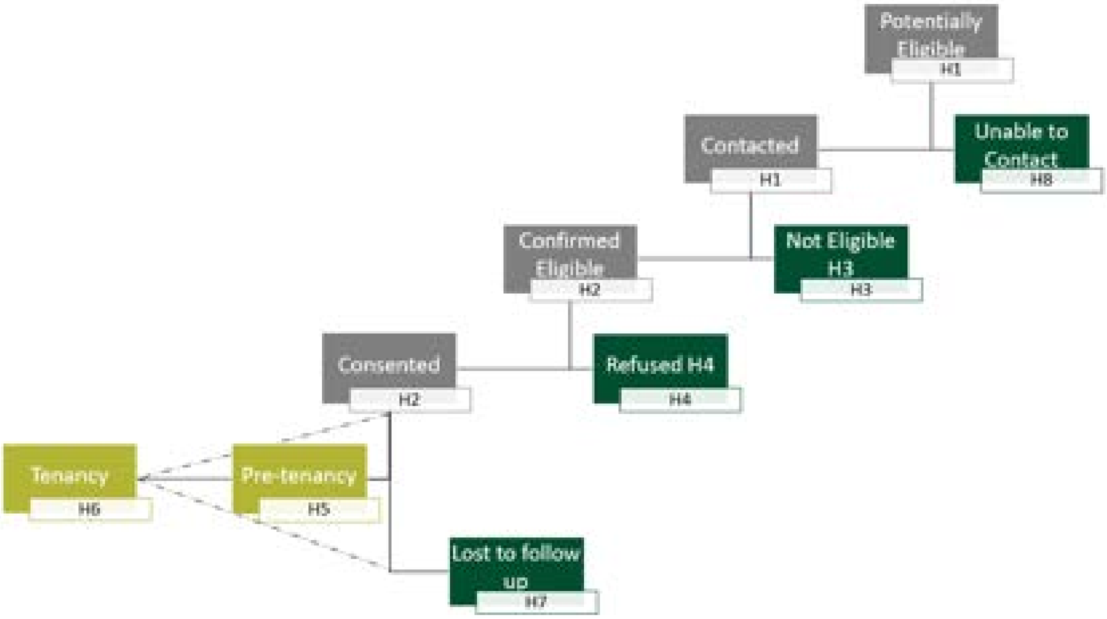
MQD developed H Codes to designate member status in the program (see Table V.3A.4). Health plans submit a daily file to MQD's HPMMIS system providing updates on CIS beneficiaries' statuses. Potentially eligible members are assigned H1 and once contacted, deemed eligible (H2) or ineligible (H3) for CIS. Those members who are unable to be reached, move to H8. Eligible members who provide their consent, move to tenancy (H6) or pre-tenancy (H5) services dependent upon need. Those members who refuse consent, move to H4. Members who are enrolled (H5 or H6) but are lost to follow up, move to H7. Each time a member's CIS status changes, health plans submit a H Code update to MQD, closing out the previous H Code status (if applicable) and opening a new one.

Table V.3A.4. CIS H Code Status

H Code	Status Description
H1	Potentially Eligible
H2	Contacted - Eligible
H3	Contacted - Not Eligible
H4	Contacted - Eligible but Refused
H5	Consented - Receiving Pre-tenancy Services
H6	Consented - Receiving Tenancy Services
H7	Consented - Lost to Follow Up
H8	Potentially Eligible, Unable to Contact

Based on memo QI 2003 (MQD, 2020), the expectation is that members will move through status codes as they are identified as eligible, contacted, consented, and provided services (see Figure V.3A.2). However, members may move through multiple statuses in a day. Because dates cannot overlap, only the last status code is reported for the day. Therefore, some transitions may not be captured with this data.

Figure V.3A.2. H Code Status Flow Chart



H Codes and the H Code Flow helped the evaluation team understand how members identified for CIS moved through the program and how those who are identified eligible but never receive services differ from those who do receive services (RQ3A.3). For the sake of this report, those members in H5 or H6 are considered enrolled. Those in H1 and H2 are considered to be potential CIS members but not enrolled, and those in green in Figure V.3A.2.H are not enrolled. We recognize that members who have consented but have yet to receive services could be considered “enrolled” as well. However, the current H code status system does not allow for us to differentiate those members (i.e., members in H2 may or may not have consented).

Encounter Data

In addition to H Code data, the evaluation team examined encounters reported by health plans to MQD during the evaluation period through March 2023. These encounters included both pended and non-pended encounters for services related to CIS (see memo QI 2105 [MQD, 2021]): outreach (HCPCS code: T1023); completion of assessments and plans (HCPCS code: T2024), provisions of housing and other coordination or social services (HCPCS codes: H0043, H0044), and case management (HCPCS code: T1016). UH evaluators used encounter data to understand how many unique members had claims submitted for CIS and what types of services were provided.

Analysis

The evaluation team matched data from encounters (including demographics and H Codes data), quality measures, and health plan reports/data releases to gain a comprehensive understanding of unique CIS members and their characteristics. It was then able to compare CIS members to all Medicaid recipients above the age of 18 years on key indicators. Statistical comparisons among members reaching various H

Code Status and/or those that exited the program were conducted to determine whether members who received pre-tenancy (H5) or tenancy (H6) services differed significantly from those who were deemed not eligible (H3), eligible but refused (H4), lost to follow-up (H7), or unable to be contacted (H8).

Definitions

Below are the definitions used in the evaluation analyses:

CIS Member. Member who has been assigned any H Code during the evaluation period (closed or open).

Exited. Anyone whose last H Code has an end date.

Ever Enrolled. A member who has ever consented to CIS and been assigned to H5 or H6.

Enrolled. Someone is currently enrolled if they have an open H5 or H6 code (i.e., the last end code is H5 or H6 with no end date).

Not Enrolled. Member who has never enrolled but may (H1, H2), never enrolled and likely will not (H8, H3, H4) or has disenrolled (H7). While we would expect members who have disenrolled and never enrolled to be "exited", not all of these members have an end date on their last H Code status, meaning that their status could still change.

Results

The results section is organized by results related to outputs (program process) and outcomes (progress towards meeting short- and long-term goals and outcomes).

Outputs

This section details CIS outputs identified in the logic model and provides data on members identified for CIS and their characteristics, members who received services (i.e., enrolled members), assessments completed, and provision of services. This data is triangulated from encounter data as well as the quarterly reports from health plans.

CIS Members

During the evaluation period—January 2020 through March 2023—a total of 4,656 members had enrolled in any H Code (H1-H8). Despite assumptions in the H Code status flow (see Figure V.3A.2), results show that most (88%) but not all CIS members' initial H Code was H1 (see Table V.3A.5). For example, 6% of CIS members had an initial H Code of H5 (Pre-Tenancy), and 2% of H6 (Tenancy).

Table V.3A.5. CIS Members with Any H Code by Initial and Final H Code, 2020–2023

	Initial H Code		Final H Code	
CIS Members by Current Status Code	**n**	**Percent**	**n**	**Percent**
H1: Potentially Eligible	4,101	88.1	1,754	37.7
H2: Contacted - Eligible	127	2.7	275	5.9
H3: Contacted - Not Eligible	27	0.6	415	8.9
H4: Contacted - Eligible but Refused	NR	NR	71	1.5

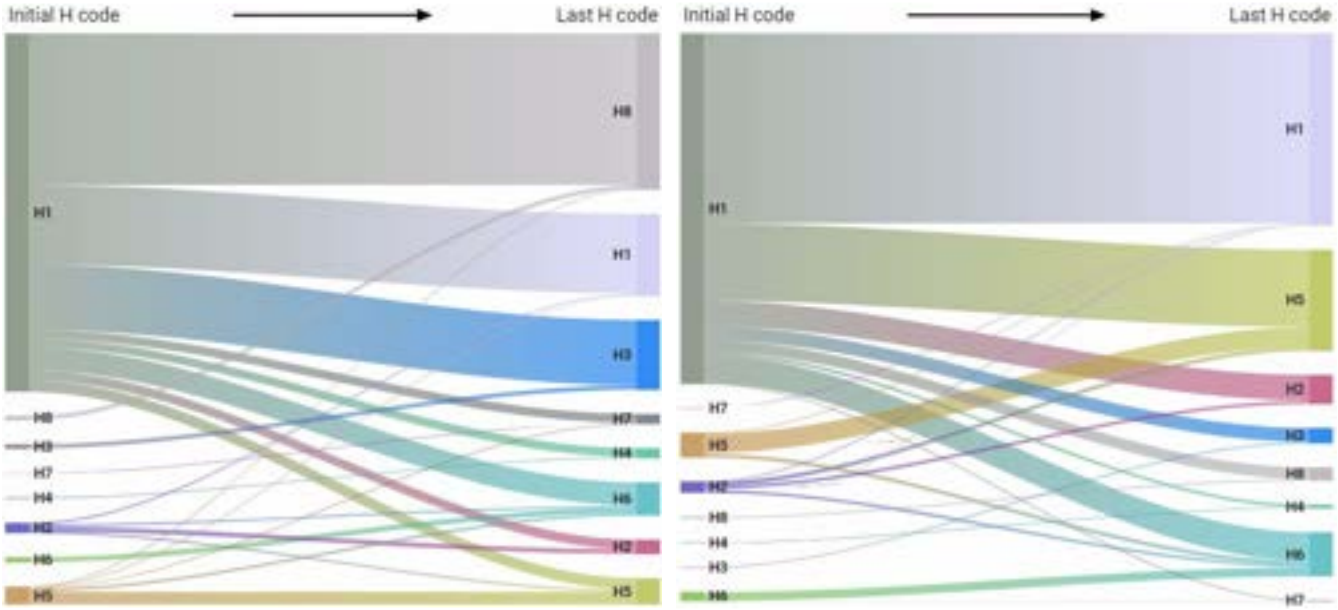
H5: Consented - Pre-tenancy	259	5.6	850	18.3
H6: Housing Tenancy - Receiving Services	92	2.0	464	10.0
H7: Consented but Lost to Follow-up	NR	NR	52	1.1
H8: Potentially eligible but unable to contact	33	0.7	775	16.7
Total	**4,656**	**100.0**	**4,656**	**100.0**

Note. Cells with 10 or fewer individuals have been suppressed (NR).

Similarly, the largest percentage of CIS members were also assigned H1 as their *final* H Code as of March 2023. However, this percentage (37.7%) was much lower than the percentage of all members who started in H1 (88.1%), suggesting that members were starting to flow through the H codes despite a notable backlog.

The evaluation team also looked at differences in H Code status flow for individuals who exited (*n* = 1,746) and those who were current members (*n* = 2,910) in March 2023. Of all current members (with an open H Code) who started in H1, 54.2% were in H1 as of March 2023, compared to 22.2% of exited members who started in H1. Approximately, thirty-nine percent (38.8%) of all exited CIS members had a final H Code of H8—unable to contact—suggesting a bottleneck in determining eligibility for potentially eligible members, a challenge noted frequently in HP's qualitative reports. See Figure V.3A.3 below.

Figure V.3A.3. Flow from Initial to Final H Code by CIS Members–Exited & Current

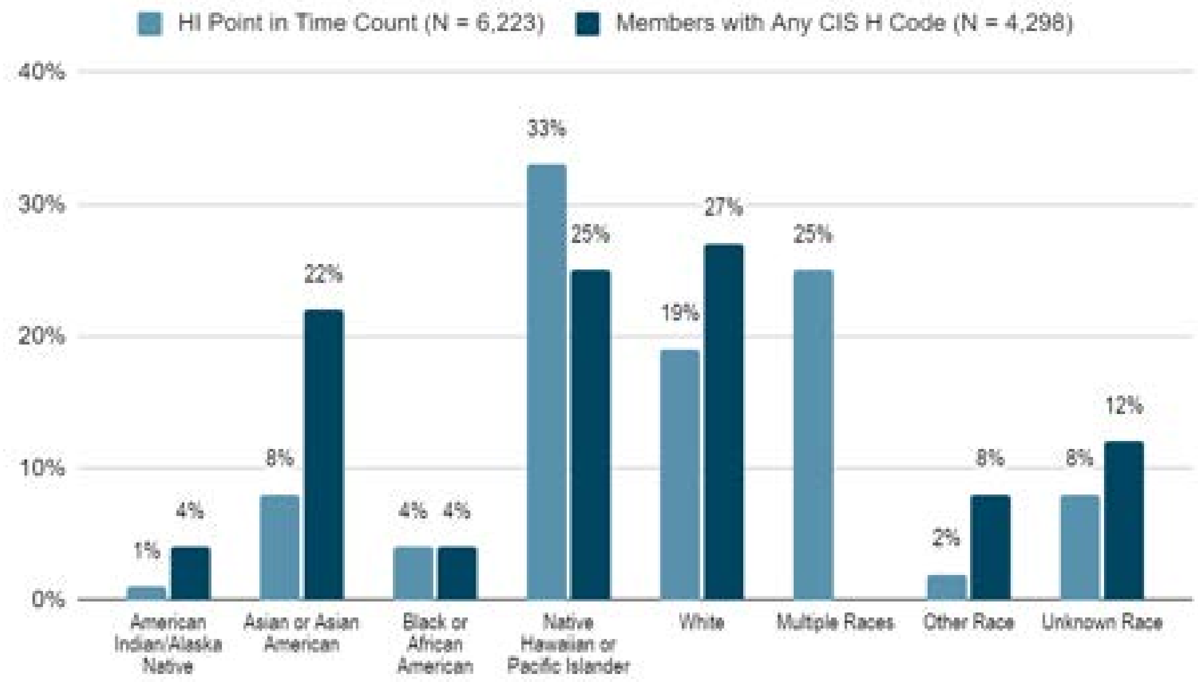


Left: Exited CIS members (closed final H code)

Right: Current CIS members as of March 2023 (open H code)

The largest percentage of all members who have been in any H Code were CIS members who identified as non-Hispanic White (26.5%; *n* = 1,137), followed closely by those who identified as NHPI (23.6%; *n* = 1,015). The evaluation team compared CIS racial breakdown to the racial breakdown of the 2023 Point in Time (PIT) count for the state (Figure V 3A.4). The PIT provides a census of the number of sheltered and unsheltered houseless individuals on a given night in January. CIS members disproportionately identified as Asian, White, American Indian/Alaska Native, and Other Race when compared to the state homeless population. People who identified as NHPI were disproportionately less likely to be CIS members when compared to their representation in the state's homeless population. This finding suggests that CIS may not be identifying CIS eligible NHPI members.

Figure V 3A.4. Race of Members with Any CIS H Code Compared to the 2023 State Point in Time Count



Note. Point in Time Count race percentages were calculated using data tables available in the appendices of the O'ahu 2023 Point in Time Count Comprehensive Report for Honolulu County and the 2023 Bridging The Gap CoC Homeless Point-in-Time Count report for Kaua'i, Hawai'i, and Maui Counties.

The evaluation team also examined racial equity with regard to members who actually received services (enrolled members) compared to all CIS members (all identified for services; Table V.3A.6). Compared to their representation of all CIS members, members who identified as White, Japanese, and Native Hawaiian were slightly more likely to move into tenancy whereas American Indian/Alaska Native, Chinese, Black or African American, Samoan, "other", and unknown race were slightly less likely to move into tenancy. For example, individuals who identified as Native Hawaiian comprised 19.5% of all CIS members and 23.0% of members in tenancy, while individuals who identified as "other" comprised 8.4% of all CIS members and 6.5% of members in tenancy. Compared to their representation of all CIS members, members who identified as White were also more likely to move into pre-tenancy whereas those who identified as Other Pacific Islander, Black or African American, and unknown race were less likely to move into pre-tenancy. These findings suggest that some racial groups are more or less likely to be outreached and to receive services once identified for CIS. Notably, CIS data is incomplete for individuals who identify as multiple races. For example, it appears that if an individual identifies as more than one race, the race that comes first in alphabetical order is the only race captured for that individual in MQD databases. This strategy for data reporting erases certain racial identities and obfuscates potential disparities associated with those identities. Thus, interpretation of this data should be made cautiously.

Table V.3A.6. CIS Members' Race by Enrollment

Race/Ethnicity	Enrolled Ever				CIS Members (Any H Code)	
	Tenancy		Pre-Tenancy			
	n	Percent	n	Percent	n	Percent
American Indian/Alaska Native	11	2.5	36	3.1	149	3.5
Asian	111	24.8	269	23.3	956	22.2
Asian Indian	0	0.00	0	0.0	NR	NR
Chinese	25	5.6	76	6.6	258	6.0
Filipino	42	9.4	111	9.6	396	9.2
Japanese	27	6.0	57	4.9	184	4.3
Korean	NR	NR	18	1.6	59	1.4
Other Asian	NR	NR	NR	NR	45	1.0
Vietnamese	NR	NR	NR	NR	NR	NR
Black or African American	16	3.6	44	3.8	175	4.1
Native Hawaiian/Pacific Islander	118	26.4	269	23.3	1,015	23.6
Guamanian	0	0.0	NR	NR	NR	NR
Hawaiian	103	23.0	229	19.8	836	19.5
Other PI	11	2.5	18	1.6	97	2.3
Samoan	NR	0.9	21	1.8	75	1.7
Other	29	6.5	101	8.7	360	8.4
White (non-Hispanic)	133	29.8	327	28.3	1,137	26.5
Unknown	29	6.5	111	9.6	506	11.8
Total	447	100.0	1,157	100.0	4,298	100.0

Note. Cells with 10 or fewer individuals have been suppressed (NR).

Enrolled CIS Members

Of all members identified for CIS, 1,396 (30.0%) were ever enrolled, meaning they presumably received some form of CIS services—tenancy or pre-tenancy—at any time during the evaluation period. The largest number of service recipients (*n* = 1,248; 26.8% of all members identified) received pre-tenancy services. Ten percent (10.3%; *n* = 480) received tenancy services (Table V.3A.7).

Table V.3A.7. CIS Members by Services Provided

Services Provided	n	Percent
Identified for CIS but did not receive Services	3,260	70.0
Received CIS Services	1,396	30.1
Pre-tenancy Services Only	916	19.7
Tenancy Services Only	148	3.2
Both Tenancy & Pre-tenancy Services	332	7.1
Total	4,656	100.0

The evaluation team also examined CIS-related encounters to understand how many members received services. According to encounter data, 377 unique people had 5,190 CIS-related billable encounters reported during the evaluation period through March 2023 (See Table V.3A.8). Three hundred twentytwo (322) members had encounters coded as supportive housing per month (3,316 encounters). This number is substantially lower than the number of members reported in H5 or H6 (*n* = 1,396). For the purposes of this report, we focus primarily on those members reported in H5 or H6 because this data allows for comparison of CIS members to non-CIS Medicaid beneficiaries while recognizing that this number is likely an over-estimate of the number of members who have received CIS. This choice was further justified by our awareness of billing challenges experienced by several HSPs, causing fewer claims to be submitted than services provided, and a substantial proportion of submitted claims to be rejected due to insufficient experience in submitted healthcare claims by HSPs.

Table V.3A.8. CIS Billable Encounters, January 2020 through March 2023

CIS Billable Encounter Procedure Codes	Number of Unique People*	Number of Encounters	Percent of Encounters
T1023--Outreach	327	697	13.4
T2024—Assessments, plan development	301	1,167	22.5
Assessments/Reassessments	283	599	11.5
Plan development	218	475	9.2
Unspecified	32	93	1.8
H0044—Supportive housing per month	322	3,316	63.9
T1016-U2—Case management to support members lost to follow up	NR	NR	NR
Total	377	5,190	100.00

Note. Cells with 10 or fewer individuals have been suppressed (NR).
*Unique people may have more than one encounter.

CIS Enrolled Member Assessments

Of the 1,396 members who were ever assigned to H5 or H6 (tenancy or pre-tenancy services), health plans reported assessment (first assessment, reassessment, or both) data on 335 members. Of those 335 members, 228 members (16.3% of all enrolled members) had first assessment data, and 125 (9.0% of all enrolled members) had re-assessment data (Table V.3A.9). Of those members with first assessment data, only 72 were mostly complete, representing just 5.2% of all members who were ever enrolled in CIS. It is unclear if additional or more complete assessments exist. Assessment data is reported quarterly by health plans based on assessments conducted internally or collected from HSPs who conduct them externally. Lags in data collection and reporting may be partially to blame for the large percentage of CIS members with no assessment or incomplete assessment data. However, the number of members with reported assessments is similar to the number of members with assessment-related encounters. Encounters data shows that 599 assessments were conducted with 283 unique members.

Table V.3A.9. CIS Enrollees by First Assessment Data Type

First Assessment Data Type	n	Percent
No First Assessment Data	1,168	83.7
First Assessment Data	228	16.3
Mostly Complete	72	5.2
Mostly Incomplete	156	11.2
Total	1,396	100.0

Of the 125 members with reassessment data reported by health plans, 20 had been reassessed more than once. Notably, only 18 of the 125 members with a reassessment had received a first assessment (Table V.3A.10). It is unclear if this discrepancy resulted from an error in labeling (data was actually first assessment but labeled as reassessment), error in reporting (first assessment was completed but not logged or submitted to evaluation team), or another error in data reporting or implementation. Therefore, this data is of questionable quality, and caution should be exercised generalizing results to the broader CIS population.

Table V.3A.10. CIS Enrollees by Re-Assessment Data Types

Re-Assessment Data Type	n	Percent
No Re-Assessment Data	1,271	91.1
Re-Assessment Data	125	9.0
With First Assessment	18	1.3
Without First Assessment	107	7.7
Total	1,396	100.0

CIS Services Provided

The evaluation team examined encounter-tracking codes for CIS tenancy and pre-tenancy supports in order to understand what types of services were provided during the evaluation period (see Table V.3A.11). The most frequently reported codes were for case management (*n* = 492) and housing supports (*n* = 400), comprising 48.0% and 39.0%, respectively, of all encounter-tracking codes (*n* = 1,026). No other encounter-tracking code comprised more than 5% of all codes, including the code for supports related to medical re-engagement and care coordination—a key goal of CIS (see introduction and logic model).

Table V.3A.11. CIS Encounter-tracking Codes, January 2020 through March 2023

CIS Tracking Encounter Procedure Codes	Number of Unique People*	Number of Encounters	Percent of Encounters
T1016-U1—Case management	41	492	48.0
H0043-U3—Provision of Housing Supports	80	400	39.0
H0043-UB—Re-assessment & plan revision	25	41	4.0
H0043-UC—Other services	14	24	2.3
H0043-U4—Medical re-engagement & care coordination supports	NR	NR	NR
H0043-0—Unknown service	16	18	1.8
H0043-UA—Other supports not identified elsewhere	NR	NR	NR
H0043-U5—QUEST & other DOH program referral supports	NR	NR	NR
H0043-U8—Provision of financial assistance supports	NR	NR	NR
H0043-U6—Provision of safety supports	NR	NR	NR
H0043-U9—Employment & housing readiness supports	NR	NR	NR
H0043-U7—Provision of supports to address social risk factors	NR	NR	NR
Total	117	1,026	100.00

Note. Cells with 10 or fewer individuals have been suppressed (NR).
*Unique people can have more than one encounter-tracking code.

CIS Outputs Summary

Returning to CIS outputs—the measurement of program activities identified in the logic model: of the 4,656 members with any H Code during the evaluation period, 38.4% (*n* = 1,787) were confirmed eligible. This number includes members ever assigned to H5, H6, H2, or H4. Of those members confirmed eligible, 78.1% (*n* = 1,396) moved into tenancy and pre-tenancy services at some point during the evaluation period. However, the number of members with encounters was significantly fewer than the number of members ever assigned to H5 or H6, with housing support encounters for 322 members.

Of those members who moved into tenancy (H6) and/or pre-tenancy services (H5), 5.2% (*n* = 72) had a first assessment with completed data and 1.3% (*n* = 18) had both a first assessment and a re-assessment. Because of significant data quality issues, the evaluation team was unable to determine the accuracy of assessment data as well as whether an assessment was a first assessment or a reassessment. Encounters data show 283 people have an assessment-related encounter. Additionally, a total of 218 unique members had encounters for developing a person-centered housing support plan. Based on lack of data, the evaluation team was unable to determine if other program activities related to creating crisis or eviction prevention plans, connecting to plan benefits and social services, providing housing or housing improvement services were completed. Additionally, the team was unable to determine how many members of those determined eligible were consented to participate in CIS because no H Code exists for consented but not yet receiving services (Table V.3A.12).

Table V.3A.12. CIS Logic Model: Outputs

Activity	Output	Definition/Data Source	Number
1. Identify potentially eligible members	1.# potentially eligible members identified	Members with any H Code	4,656
2. Confirm eligibility	2. # confirmed CIS-eligible members	Members ever assigned H5, H6, H2, or H4, H5 or H6.	1,787
3. Obtain consent and enroll in CIS	3.# members consented & enrolled	Members ever assigned H5 or H6 + Any H7	Unknown*
4. Provide tenancy and pre-tenancy services	4. # members receiving Pre-tenancy/Tenancy services	Members ever assigned H5 or H6	1,396
	# MEMBERS WITH SUPPORTIVE HOUSING PER MONTH ENCOUNTERS	Claims and encounters data	322
5. Complete CIS Assessments and Housing Assessments	5.# CIS assessments and housing assessments completed	Assessment data from HP quarterly reports	228 (72 with complete data)
	# MEMBERS WITH ASSESSMENT/RE-ASSESSMENT ENCOUNTERS	Claims and encounters data	283
6. Create person-centered housing support plan	6.# members with plan development encounters	Claims and encounters data	218

7. Create person-centered crisis plan or eviction prevention plan	7. # person-centered CIS crisis plans or eviction prevention plans created	Data not tracked	Unknown
8. Connect member with plan benefits and social services	8.# CIS members connected with plan benefits and social services	HP quarterly reports–data too incomplete to determine	Unknown
9. Provide housing quality and safety improvement services	9.# members housed or rehoused in appropriate housing	Data not tracked; unclear if service is provided	Unknown
10. Ongoing (re)assessment	10.# members re-assessed # MEMBERS WITH RE-ASSESSMENT ENCOUNTERS	Re-assessment data from HP quarterly reports Claims and encounters data	125 (18 also had a first assessment) 25

Note. HP = health plan.
*Limited to no data–no H Code for Consented but not receiving services. This data is captured in quarterly reports, but the quality of this data is poor and unusable for analysis.

Outcomes: Goals and Impacts

In addition to outputs, the evaluation team examined key outcome measures related to CIS goals and impacts, including emergency department (ED) visits, total cost of care, and CIS member health and wellbeing. However, the team was unable to examine changes in these measures over time due to the fact that the program was not fully implemented until late 2022. Additionally, of the exited members who ever enrolled in services, only a small percentage were presumably housed at any point (i.e., receiving tenancy supports), and housing impacts on outcomes are unlikely in this short time period. Thus, the evaluation team examined these outcome measures at baseline to understand the members' characteristics and to answer revised research questions for the project. In addition to baseline measures, the evaluation team examined exited members' trajectories through CIS. Understanding how members who exited the program flowed in and out of CIS can aid in understanding both program process and program progress toward goals.

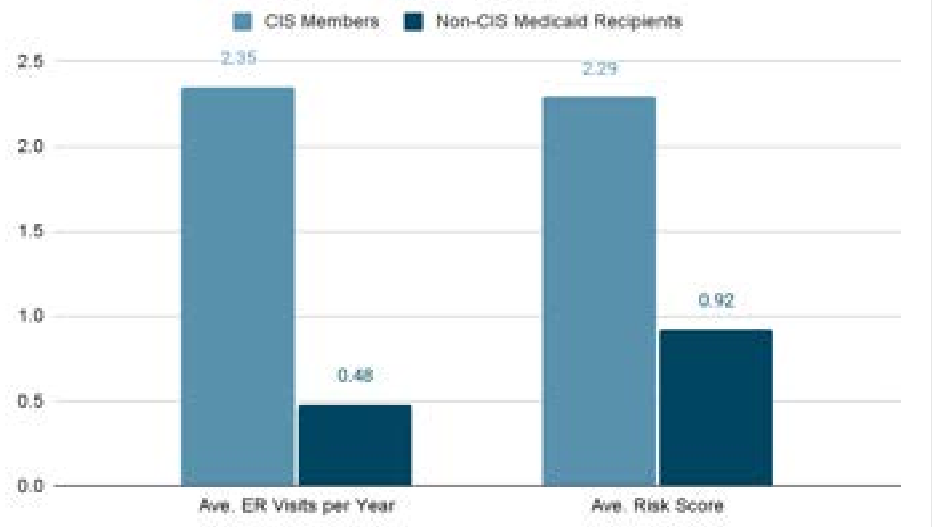
Emergency Department Visits and Risk Scores

On average, members identified for CIS had a higher average number of annual ED visits in the year prior to CIS enrollment compared to non-CIS Medicaid recipients. CIS members had an average of 2.35 ED visits per year, which is more than four times the average number of ED visits for non-CIS Medicaid members (0.48; Figure V.3A.5). Enrolled members had higher average number of annual ED visits compared to members identified as potentially eligible for CIS but who did not receive services (Table V.3A.13). For example, members whose final H Code as of March 2023 was H5 (pre-tenancy) had an average of 3.45 ED visits in 2021; those in H6 (tenancy) had 2.55, compared to 2.14 for members who were eligible but did not receive services. Notably, those members identified as potentially eligible but eventually determined ineligible (H3) had an average of 2.19 ED visits, which is still much higher than the average non-CIS Medicaid recipient, suggesting that these members may need additional supports outside of CIS.

The team also examined risk scores, which are used to estimate future cost and morbidity, for CIS members compared to other non-CIS Medicaid recipients. CIS members had an average risk score of

2.29 compared to 0.92 for the average non-CIS Medicaid recipient. Examining CIS members by final H Code status, members who were determined eligible but did not receive services and those who were lost to follow up had the highest average risk scores (3.13 and 3.30, respectively), even higher those of members who received CIS tenancy and pre-tenancy services.

Figure V.3A.5. Average Risk Score and Annual ED Visits by CIS Member Status



Note: The number of member annual ED visits was extrapolated by dividing the number of ED visits by the number of months the member was enrolled in Medicaid and the resulting number multiplied by 12.

Total Cost of Care

Examining total cost of care in 2022, the evaluation team found that members identified for CIS tended to have higher costs of care compared to non-CIS Medicaid members. Among Medicaid members over 18 years-old who received any care in 2022 (N = 217,378), the overall total cost of care averaged $12,548 *(data presented in section V.0 Results, Overall Demonstration Evaluation, Outputs),* while the cost of care for CIS members averaged $20,297. Notably, CIS members whose final H Code in March 2023 was H2 (confirmed eligible but not yet receiving services) had a higher average total cost of care ($29,114) than any other H code.

Table V.3A.13. CIS Members' Acute Services Utilization, Risk Scores, & Total Cost of Care by Final H Code

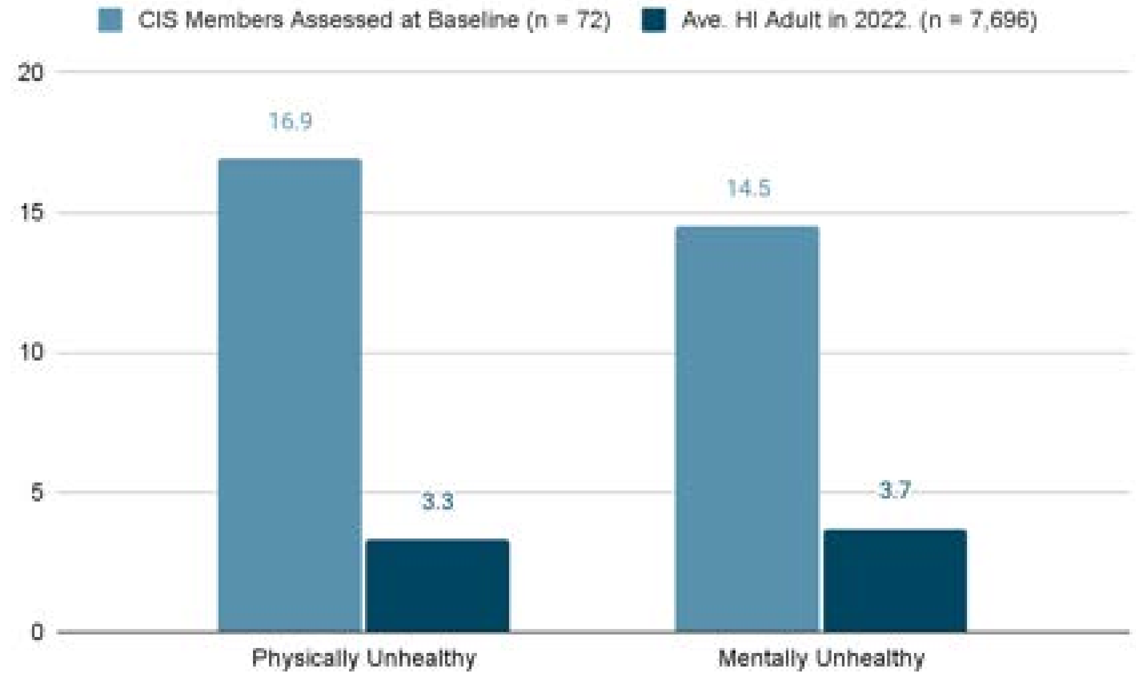
Final Status Code	ED Visits		Risk Score		Total Cost (2022 health plan)	
	n	Mean	n	Mean	n	Mean
H1: Potentially Eligible	1754	2.40	1754	2.20	1365	$17,829
H2: Contacted - Eligible	275	2.14	275	3.13	247	$29,114
H3: Not Eligible	415	2.19	415	2.59	347	$24,783
H4: Refused	71	1.71	71	1.66	56	$11,185
H5: Pre-tenancy	850	3.45	850	2.74	779	$23,698
H6: Housing Tenancy	464	2.55	464	2.90	431	$22,072
H7: Lost to Follow-up	52	1.62	52	3.30	44	$20,455
H8: Unable to contact	775	1.23	775	1.41	485	$13,541
Total	4,656	2.35	4,656	2.29	3754	$20,297

Note. This table does not represent long-term changes in H-code movement as some members entered directly into H5 or H6.

Member Health and Well-being

To examine member self-reported health and well-being at baseline, the evaluation team analyzed assessment data for CIS enrolled members. A total of 72 members had complete first assessment data. These 72 members reported feeling physically unwell an average of 16.9 days in the previous month at first assessment. This number is substantially higher than the 3.25 (95% CI: 3.02–3.47) days reported by the average adult in Hawaiʻi in 2022 (USCDC, 2022). Similarly, CIS enrolled members reported a substantially higher number of mentally unwell days compared to the general state population, at 14.5 days compared to 3.7 (95% CI: 3.28–3.96) days. The average number of days members reported that they were unable to do their daily activities due to mental and physical issues was high at 16.9 days in the last month at first assessment, compared to 4.4 reported by the general state population. These data further support the evaluation team's preliminary findings that CIS is reaching members with high mental and/or physical medical needs. However, the evaluation team was unable to analyze change over time because of incomplete data and the fact that so few members had both a first and reassessment. The evaluation team hopes that with data quality and reporting improvements, it will be able to assess changes in these in the near future.

Figure V.3A.6. Average Number of Unhealthy Days Reported in Last 30 Days at First Assessment by CIS Members in 2021-2023 Compared to the Average Adult in Hawaiʻi in 2022,



Note: Average Hawaiʻi adult data retrieved from U.S. Centers for Disease Control. (2022). Behavioral Risk Factor Surveillance System (BRFSS) 2022.

Exited CIS Member Trajectories

To understand trajectories through CIS by status code, the evaluation team examined H Codes for any members identified for CIS who have exited CIS at first code and last code as well as final H Codes for exited members who were ever confirmed eligible and who ever received tenancy and pre-tenancy services. A member is considered “exited” if the last H Code for that member in Med-QUEST’s HPMMIS system has an end date. In this section, we present findings on exited CIS members’ initial and final H Codes from January 2020 through March 2023.

A total of 1,746 CIS members had exited CIS by March 2023—about 37.5% of all CIS members with any H Code (Table V.3A.14). The largest percentage of exited members had a final H Code of H8, unable to contact (*n* = 678; 38.8%), followed by H1, potentially eligible (*n* = 356, 20.4%), and H3, not eligible (*n* = 303, 17.4%). It is unclear why members’ last H Code would be H1, potentially eligible. One possible explanation is that health plans were able to determine a member was not eligible prior to contacting them. Additionally, members may have disenrolled from Medicaid, changed health plans, passed away, or moved to another state before health plans were able to assess eligibility.

Table V.3A.14. Exited CIS Members' Final H Code Status as of March 2023

CIS Members by Current Status Code	n	Percent
H1: Potentially Eligible	356	20.4
H2: Contacted - Eligible	63	3.6
H3: Contacted - Not Eligible	303	17.4
H4: Contacted - Eligible but Refused	44	2.5
H5: Consented - Pre-tenancy	114	6.5
H6: Housing Tenancy - Receiving Services	144	8.3
H7: Consented but Lost to Follow-up	44	2.5
H8: Potentially eligible but unable to contact	678	38.8
Total	1,746	100.0

Note. This table does not reflect movement back and forth throughout members' time in the program. For example, one member may start out as potentially eligible (H1), confirmed eligible and move into pre-tenancy (H5), then into tenancy (H6) before exiting the program. In this case, only H1 and H6 would be reflected in this table.

Of the 1,746 exited CIS members, 439 (25.1%) were confirmed eligible at some point during the waiver period (i.e., ever assigned H2). Of these members that were confirmed eligible, 20% were assigned H5 (Pre-Tenancy), and 32.8% were in H6 (Tenancy) as their final H code. Notably, 23% of those ever confirmed eligible remained in H2 at exit, and 12% were lost to follow-up. These findings suggest that of those members found eligible for CIS, 33.0% (*n* = 145) were receiving tenancy or pre-tenancy services at exit.

Of those members who exited CIS, 153 (8.8%) were enrolled in tenancy at some point, the vast majority of which (93.5%; *n* = 143) remained in tenancy (H6) at exit. Two hundred fifty-five members (*n* = 255; 14.6% of members who exited) were in pre-tenancy at some point during the waiver period. Forty-five percent (*n* = 114; 44.7%) of these members in pre-tenancy were still enrolled in pre-tenancy at exit, and 39.2% (*n* = 100) had transitioned to tenancy at exit. Taken together, these findings suggest that of those exited members who received tenancy services, the majority remained housed at exit, while 44.7% of members receiving pre-tenancy services exited without stable housing.

However, a significant limitation is that data is not collected on exit destinations. Therefore, assumptions based on H Code status at exit must be considered cautiously. For example, it is possible that members who exited while still in pre-tenancy may have exited because they secured stable housing and no longer needed tenancy or pre-tenancy services. To address this limitation, MQD added exit destination information to CIS forms and assessments as part of the "CIS Reboot" discussed below.

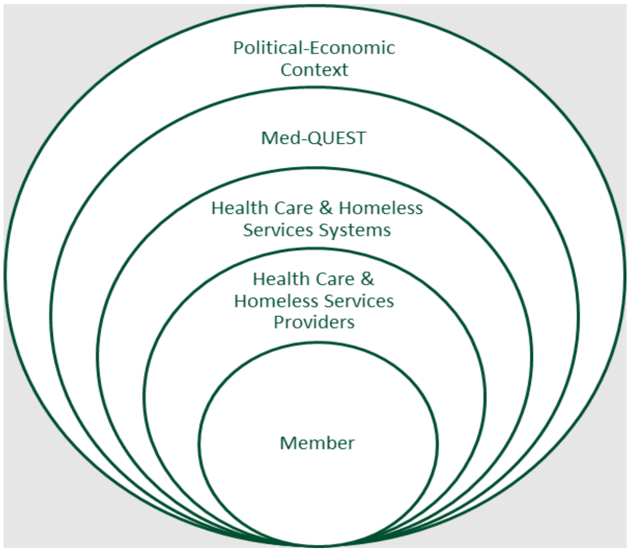
Program Implementation

Based on interviews with health plans and providers, participant observations of hours of meetings, and qualitative portions of quarterly data, the evaluation team documented program implementation challenges and responses to those challenges. These findings also provide context for quantitative data.

Implementation Challenges

Many of the following challenges were initially brought up in interviews conducted in the early stages of CIS implementation (Summer 2021) and remained barriers to implementation throughout implementation of the CIS program. Reviewing these challenges, the evaluation team realized that many of them were reflective of other states who have implemented similar Medicaid supported housing benefits (Thompson et al., 2021). Experiences of other states that are further along in the implementation process offer the opportunity for Hawaiʻi to benefit from their lessons learned. The evaluation team organized these challenges within a multilevel framework (see Figure V.3A.7). Taking a multilevel approach to program implementation and evaluation can help stakeholders identify how challenges at one level can impact other levels as well as can be useful in determining what challenges are solvable and by whom.

Figure V.3A.7. Community Integration Multilevel Framework



Housing Supply Issues

One of the most common challenges involved housing supply. While referring to the lack of affordable housing broadly, particularly for low-income renters, housing supply issues also include lack of sufficient housing subsidies to address the needs and limitations of Medicaid support coverage (e.g., inability to use funds to pay rent). Additionally, finding appropriate housing for members with special needs—a large proportion of those eligible for CIS—can be challenging. For example, many CIS members have complex physical health needs that require certain housing characteristics (e.g., wheelchair access) that are in low supply. While this issue is largely dictated by the political-economic context—and thus, outside of the control of the health plans and providers—it is an issue that impacts every other level, including the CIS member. This issue may also explain the relatively small percentage of members who transitioned from pre-tenancy to tenancy.

Enrolling and Retaining Members

Many states, Hawaiʻi included, have difficulty enrolling and retaining members in CIS-type programs. One reason for this difficulty includes the fact that members belonging to a population that is medically vulnerable and experiencing housing instability/homelessness are hard to reach precisely because of those vulnerabilities. Typical strategies for engagement do not work (e.g., phone calls, mailers), and reaching these members requires daily coordination between health plans and HSPs. The health plans noted increased difficulty in reaching members throughout COVID-19 as there have been restrictions on face-to-face interactions which is one of the only ways that many members within this particular population can be reached regularly. Additionally, determination of eligibility and subsequent enrollment require access to both homelessness services and Medicaid systems that are siloed and are not easily accessible across silos. These roadblocks can lead to “churning enrollment” in CIS as members are lost to follow up and lose eligibility despite continued need for the benefit (Thompson et al., 2021, pg. 20). These issues have direct consequences for members, with those experiencing housing instability being most at risk for not being enrolled in programs for which they qualify. These challenges also may help explain racial disparities identified in H Code data. It may be more difficult to find members in geographic locations where certain racial groups may be more likely to reside (e.g., rural areas of the state that have higher concentration of Native Hawaiian and Pacific Islander groups).

Bridging Two Siloed Systems: Healthcare and Housing Services

The coordination between healthcare and housing services is vital to the success of a program like CIS. These systems are complex and often siloed. CIS-type programs have struggled to bridge the two sectors without overburdening either health plans or HSPs, both of whom often struggle to find a shared language. Almost every other challenge identified is related directly or indirectly to this issue. Here in Hawaiʻi, most HSPs are not medical providers and have limited background in health care or capacity to bill for services. This lack of capacity has proven to be a challenge, particularly when it comes to assessments and associated data collection and sharing. As it stands, HSPs and health plans use different data collection and sharing platforms, and sharing access between systems has proven difficult. Currently, no infrastructure exists for sharing the data, and much of the assessment data is faxed and filed on paper rather than inputted into a connected, electronic system. Additionally, each health plan has their own system in place, requiring HSPs to understand and navigate five separate processes to ensure a successful partnership.

Contracting and Paying Homeless Services Providers

Directly related to bridging health and homeless services, contracting with and paying the HSPs participating in CIS has proven challenging for CIS in Hawaiʻi and across the US. The contracting process is often long and tedious and is an administrative burden for HSPs. Once contracted, HSPs often lack the capacity to manage and submit claims, resulting in rejected claims and delayed payment, which is often inadequate to cover costs of service provision. MQD began addressing this issue in the 2023 CIS “reboot” discussed later. HSPs also face “supplantation” challenges which involve piecing together multiple funding sources to serve members while ensuring that funding sources do not overlap (Thompson et al., 2021, pg. 24). This challenge has impacted the number of participating HSPs and system capacity to provide CIS. All of these challenges are exacerbated by the fact that many CIS-type programs don’t not cover start-up funding or overhead costs, which are necessary to implement the program at the HSP level. Some local HSPs have noted their desire to be contracted but said they are waiting to contract when implementation is fine-tuned and challenges have been addressed.

Recruiting and Retaining Staff

health plans and HSPs reported hiring difficulties, a challenge reported across industries nationwide. For example, here in Hawaiʻi, 15 homelessness service agencies were hiring for over 40 positions at the end of June 2023 (PIC Weekly Update, 2023). Health plans and HSPs nationwide reported recruiting difficulties due to the lack of job security that the impermanence of a waiver demonstration creates. They also noted difficulties finding staff that have both the skills to provide services and to document and bill for them. Often the individuals who are most skilled at providing direct services are those with less formal training and qualifications. Beyond the challenge of hiring the staff, building a cohesive unit of staff across sectors was a common challenge mentioned that leads to retention issues. An integrated health and housing program requires many types of staff working together, and these staff members often have different levels of expertise, have different values, and lack a shared language.

Durability beyond Current Waiver

Another concern regards the uncertainty about the continuation of funding beyond the funding cycle. This uncertainty can lead to less buy-in from stakeholders given the potential for discontinuation of the program after the demonstration. In Hawaiʻi, this concern impacts the extent to which HSPs are willing to participate in the program—particularly small HSPs with less capacity. Given the start-up costs and administrative burden of integrating Medicaid billing into existing financial structures, many local HSPs have adopted a "wait and see" approach before investing time and money into what could be a short-term program.

CIS "Reboot" and Technical Assistance

In response to these challenges, in January 2023, MQD developed an internal "Core CIS Team." The team consisted of two CIS leads (one with a public health background and another with a social work background), a project manager, an administrator with health plan background and billing expertise, an administrator with extensive Medicaid knowledge, and a local homelessness research psychologist from the evaluation team. Through collaboration with health plans, homeless service providers, homeless service system leaders, and the evaluation team, the core team re-envisioned CIS to fit within the local context and could be used to meet local needs. It also worked to resolve specific issues related to program implementation. In particular, the team addressed the billing and payment issue and worked to carefully balance stakeholder needs and requests. The team also worked to reduce bureaucratic barriers for both HSPs and members. For example, it significantly reduced the length of assessment and action plan forms in order to streamline the process and maximize other data collection forms and clinical assessment information. The team continues to hold bi-monthly meetings with both health plans and providers.

In addition to the reboot, MQD collaborated with health plans to troubleshoot issues related to forms, data, and reporting. For example, beginning in January 2022, MQD and the evaluation team began providing ongoing technical assistance to health plans related to CIS reporting and H Code status assignment. In April 2022, in response to HP challenges with reporting member level data (discussed in limitations below), MQD worked with the evaluation team and a consulting group to map the report template to CIS forms and to include formulas to assist health plans in calculating their progress toward key performance indicators.

HP Success Strategies

health plans also developed internal strategies to meet these challenges. For example, to enroll and retain hard to reach members, health plans reported accessing and checking the state's Homeless Management Information System (HMIS) and patient charts internally for information, scheduling face-to-face meetings rather than phone contact, connecting regularly with HSPs, and working together to plan and troubleshoot. Additionally, in order to develop sustainable partnerships with HSPs, health plans worked to integrate into and invest in the community and to leverage existing relationships with service agencies (e.g., those involved in CCS). To continue help build system and HSP capacity, health plans reported providing ongoing education and outreach to HSPs and the local Continua of Care (CoCs).

Limitations

All results and conclusions should be considered in light of the following limitations.

Data Quality

Data quality proved to be a consistent issue throughout the evaluation period. Health plans often submitted quarterly reports with a considerable amount of missing data, in formats that were inconsistent with the reporting templates, and with quantities that were inconsistent with other forms of data submission. For example, it was common for the total number of CIS members reported in detailed member-level files to not match numbers reported in the corresponding aggregate tables or the qualitative sections of the same report. Additionally, these numbers did not match H Code data or encounter data submitted through other mechanisms to MQD's HPMMIS system. These inconsistencies made both RCAs and overall evaluation analyses difficult because the evaluation team was unsure which data gave the most accurate and complete picture of CIS implementation. In 2022, MQD hired a consultant group to work with health plans to improve data quality through technical assistance as well as by updating reporting tools to include data validation functions. Subsequently, the evaluation team has seen a noticeable improvement in data quality; however, continued improvement and consistency in reporting will be necessary to determine long-term impacts of CIS.

Lack of clarity between stakeholders

As noted previously, in using the RCA process, the evaluation team and other stakeholders had hoped for regular, ongoing improvements to the program. However, healthcare and homelessness service systems can be slow to change even when all updates are agreed upon and being put into motion. Throughout the evaluation period, there were cases in which the lag between recommendations, agreed upon changes, and actual formalized updates created confusion between stakeholders. For example, deciding on what it meant for a member to be "enrolled" in CIS or deciding if "days" in the original memo is referring to calendar days or business days. While these questions may seem trivial, stakeholders all held their own definitions and interpretations, which impacts the data collected and the conclusions that can be drawn.

Data do not show impact or outcomes

Although the initial evaluation plan included an analysis of long-term goals and impacts, the current data submitted to and obtained by the evaluation team does not allow for such analyses. CIS faced considerable roadblocks in the early stages of implementation (e.g., lag with contracting and onboarding HSPs, data quality issues, needed clarifications and edits in the memo and reporting documents) that resulted in a delay in implementation and data collected. Additionally, the data collected is not exhaustive of the CIS experience and does not capture variables needed to determine progress towards long-term goals and impacts. For example, without information on exit locations (e.g., were CIS members housed when they exited the program?) or specific services received (e.g., were they ever housed?), the evaluation team was unable to get a clear picture of all impacts and outcomes.

Conclusions and Recommendations

Despite limitations, the evaluation team was able to answer most amended research questions and to provide the following conclusions and recommendations based on triangulation of data.

RQ 3A.1 amended: Is CIS operating as intended?

Qualitative and quantitative data suggests that CIS has undergone major and necessary programmatic changes in order to best serve members and to adapt to local system needs. MQD worked to reduce bureaucratic barriers by reducing form length and frequency and by simplifying billing. MQD also provided ongoing technical assistance and improved the reporting process. To make these changes, MQD collaborated with health plans, government agencies, CoCs, and experts across the homelessness services system. By mid-2023, CIS was operating more smoothly and collaboratively at the systems-level.

How CIS is operating at the member level is less clear. Member reported data is captured in assessment data reported quarterly by health plans, but this data has suffered from data quality issues regarding collection and reporting. Overall, challenges related to data and reporting make it difficult to determine how many members have received CIS. The number of people who have been in pre-tenancy or tenancy statuses is three times the number of members who have had CIS-related claims submitted. Even fewer have had assessments reported. Anecdotal feedback from health plans suggests that H Code status data for pre-tenancy or tenancy may be inflated due to errors in status code assignment early in the program implementation. These errors predate technical assistance and may stem from miscommunication and confusion over when to assign a member to pre-tenancy or tenancy.

A major assumption of CIS and the initial evaluation questions is that members will be housed or will achieve housing stability during the program. However, this intermediate but important outcome was not consistently monitored. Much of the program activities and outputs tracked are administrative in nature (e.g., filling out assessments and reassessments). Services and their immediate outputs (e.g., number of people housed) were not tracked as consistently. These activities represent a crucial intermediate step to achieving program outcomes and impacts. It is imperative that MQD and health plans consider tracking intermediate goals and outputs of the program, particularly those related to housing outcomes. In response to this concern raised in RCAs, MQD has included housing outcomes on its revised assessments and action plans as part of the CIS Reboot.

Findings suggest that CIS has undergone major and necessary programmatic changes in order to best serve members and to adapt to local system needs. Effectiveness of CIS as operating at the member level (e.g., how many people have been served and what services they received) is less clear.

RQ3A.2 amended: Is CIS reaching the intended population?

Findings suggest that CIS is, in fact, identifying the intended population–members who are high utilizers of emergency services and likely to be associated with higher costs and morbidity as predicted by risk score. Members identified for CIS have a higher average number of annual ED visits, average total cost of care, average risk scores, and rates of homelessness compared to the average non-CIS Medicaid recipient, suggesting the program is identifying high utilizers of emergency services, those with high health care costs, those with physical and mental health needs, and those who are homeless or at-risk for homelessness. Likely the need for housing and health care services outweighs the capacity of HSPs to address them as seen in the higher number of members who are eligible for CIS but are not receiving services. However, those members who are eligible but do not receive services and those lost to follow up are still at risk and may benefit from CIS. Additionally, CIS members whose final H Code in March 2023 was H2 (confirmed eligible but not yet receiving services) had a higher average total cost of care ($29,114) than any other H code.

Quantitative and qualitative data suggest a backlog both in determining eligibility and in providing services once eligibility is confirmed. Overall, these findings are consistent with barriers brought up within qualitative data that was submitted quarterly by the health plans throughout the CIS program. Health plans discussed challenges with physically finding members who were referred. Additionally, since health plans were delegating the CIS assessment paperwork to HSPs, they relied on their contracted organizations to have the capacity to assess the members, which may not always be the case for smaller agencies, leaving members in limbo between referral and determining eligibility. Health plans listed even larger backlogs of members awaiting confirmation of eligibility and services in their quarterly submissions than were included within this report.

Data suggests that health plans are identifying the intended population for CIS; however, much of those members have yet to receive services due to backlog and lack of HSP capacity.

RQ3A.3 amended: How are members who received CIS tenancy and pre-tenancy different from those identified for CIS but do not receive services?

Because racial disparities exist regarding which groups experience homelessness and housing insecurity, the evaluation team attempted to examine race for those who were identified for CIS as well as for those members who actually received CIS. On Oʻahu, individuals who identify as White are under-represented in the homeless population but are over-represented in permanent supportive housing programs (Pruitt et al., 2022). On the other hand, individuals identifying as Native Hawaiian or Pacific Islander (NHPI) are over-represented in the homeless population and under-represented in permanent supportive housing programs.

Results suggest that people who identify as White are more likely to both be identified for CIS and to receive services once identified. NHPI members are less likely to be identified for CIS when compared to their proportion of the overall homeless population, suggesting that eligible NHPI members may not be being identified for CIS and/or may not be receiving Medicaid. More outreach to these populations may be needed. Additionally, examination of policies and procedures for potential implicit racial bias may be necessary. For example, the criteria to qualify for CIS, particularly for at-risk for homelessness, may be too restrictive and/or more likely to capture risks experienced by certain demographics. Research suggests that Native Hawaiians are more likely to list breakup of family as a cause of homelessness (PIC, 2022) and thus, are unlikely to have a written eviction letter. Amending criteria to account for risks and experiences of certain demographics may be necessary.

Additionally, those members identified as potentially eligible but eventually determined ineligible (H3) had an average of 2.19 ED visits, which is still much higher than the average non-CIS Medicaid recipient, suggesting that these members may need additional supports outside of CIS.

Examining those exited members who were eligible for CIS, approximately half received tenancy or pre-tenancy services. Given that only about half of exited CIS members who were confirmed eligible actually received services, it appears there is a backlog. Thus, there is a need for more on-the-ground and field work to reach these members. Additionally, due to the fact that there is no way to accurately track members who were consented but didn't receive services, we are unable to fully answer this question. We suggest MQD work with health plans to either develop an H Code status for Members who have consented or develop another strategy for capturing this data. This strategy may also address issues with inflated H5 and H6 numbers.

While those members receiving tenancy and pre-tenancy services had the highest average annual ED visits, those who were eligible for services but not receiving them had the highest average total cost of care, suggesting the need to address the backlog to have systems-level impact on cost of care. Additionally, findings suggest that members identifying as White may be disproportionately likely to receive tenancy and pre-tenancy services once identified for CIS.

RQ3A.4 amended: Do CIS members who receive services achieve housing stability?

It is unclear if CIS enrolled members achieve housing stability due to limited data and lack of clarity on what is meant by "stably housed". We recommend MQD define "stably housed" and continue to build in mechanisms to capture housing status of CIS members throughout the program. The CIS reboot has added some of these metrics to the CIS Action Plan, including exit destinations. Based on the data available, the number of members moving to H5 (pre-tenancy) suggests progress toward housing. Additionally, those members in H6 (tenancy) tend to stay in H6, suggesting stability. More data and definition are needed to determine if services lead to housing stability.

While a third of members who were in pre-tenancy had transitioned to tenancy at exit, it is unclear if this transition represents stable housing and whether these members ever received services. Clearer definitions of stably housed is needed.

Other Conclusions

Data collected and emphasized by MQD heavily focuses on health care outcomes. Given that services provided are primarily housing-related, it is difficult to assess short-term goals and outcomes that necessarily precede long-term health impacts and particularly impacts on the healthcare system.

Race data suggests disparities in service provision; however, the strategy for reporting race data erases certain racial identities and obfuscates potential disparities associated with those identities. Given that a quarter of Hawaiʻi residents identified as two or more races in 2022 (US Census Bureau, 2022) and the fact that known disparities exist in housing and healthcare for certain racial groups, it is imperative that MQD and health plans capture race data accurately so that they can ensure CIS is not inadvertently perpetuating racial disparities.

Encounters for supports related to medical re-engagement and care coordination—a key goal of CIS—comprised less than 5% of all encounters. Given that CIS eligibility criteria includes having a physical health need and HSPs have reported difficulties in serving medically vulnerable clients, it is imperative that health plans work to provide health coordination for CIS members.

The RCAs were valuable in that they allowed MQD to course correct in real-time. MQD responded to recommendations and issues, leading to significant progress in the first half of 2023. The RCA would have been a useful tool for the pilot program. Unfortunately, the evaluation team learned of the pilot upon its conclusion. In future pilot projects, the evaluation team recommends leveraging RCAs to better understand program process and impacts.

Many of the challenges described here are expected when implementing a novel program like CIS. Despite these challenges, CIS has the potential to have impacts at the system and individual level. Recognizing this potential impact and the need for collaboration, MQD began "rebooting" CIS in January 2023. The "reboot" approach has resulted in more providers applying for MQD provider status, including clean and sober programs, and in increased collaboration among MQD, health plans, HSPs, and other systems involved in homelessness services. For example, MQD is working with the two CoCs to integrate CIS into the coordinated entry system and is regularly meeting with state agencies involved in coordinating statewide homeless response. This intense, hands-on approach has led to increased awareness of CIS among HSPs and in reduced burdens for health plans, HSPs, and hopefully by extension, eligible members.

Recommendations

Based on available data and findings, the evaluation team makes the following recommendations:

Clean H Code Status Data

Given that monthly capitation payments are based on status code data, the evaluation team recommends that MQD work with health plans to clean this data so that it more accurately represents the number of members receiving tenancy and pre-tenancy services. MQD has implemented a risk corridor to retrieve capitation payments not tied to actual service provision; nonetheless, more work is needed to achieve alignment in reporting and service provision.

Continue to Improve Race Data Collection and Reporting

MQD has made substantial improvements in reporting over the evaluation period. The evaluation team recommends continued investment in data quality and reporting improvement. Given the importance of detecting and addressing racial disparities in health and homelessness service provision and the issues related to race data, the evaluation team recommends that MQD implement improved race data collection and reporting, especially for members who identify with multiple races. Race data should be collected and reported in a disaggregated format.

Use CIS to Meet System Needs

Given the high level of need and lack of capacity as seen in the backlogs of members potentially eligible and eligible but not receiving services, it will likely be necessary for health plans to prioritize eligible members. The evaluation team suggests that MQD and health plans examine existing needs and gaps in the homelessness service system when identifying who to prioritize. For example, the homelessness service system's coordinated entry system prioritizes people with complex physical and mental health and housing needs (i.e., people who qualify for CIS) for permanent supportive housing—a much more intensive program than CIS. CIS might be most effective when paired with other less intensive programs that serve high needs people due to lack of resources. In other words, CIS might be paired with a voucher or other housing program that provides money for rent but not for wraparound services.

Emphasize Health Coordination and Re-engagement Services

Results show that CIS members are highly vulnerable mentally and/or physically. However, existing data suggests the amount of health coordination and re-engagement in care services are few. The evaluation team suggests that health plans work to emphasize these services, which will likely require more on-the-ground work on the part of the HP and their health coordinators.

Capture Housing-Related Data

The evaluation team recommends MQD continues working to implement forms and data collection methods that capture current housing for CIS members as well as exit destinations for exiting members. This data will help illuminate progress toward short-term goals related to housing upon which long-term goals and impacts rely.

Include Member Perspectives and Perspectives of Those with Lived Experience

Homeless and housing leaders with lived experience are heavily involved in homelessness services and advocacy and offer an opportunity to learn from people on the ground what they need to take care of their health and meet their housing needs. For example, the Oʻahu Lived Experience Council has a list of these leaders with both current and past lived experience with homelessness who are available for consultation and speaking engagements. The evaluation team highly suggests that MQD and health plans involve members with lived experience in their programming and in determining success of the program. For example, meeting outcomes such as decreased total cost of care might not actually show success at the member level if those members may need to be reconnected to care (and thus, may see a short-term spike in cost).

Project 3B: Assessing the Process of Planning and Implementing Support Strategies Addressing Social Determinants of Health

Introduction and Background

Social determinants of health (SDOH) refer to the conditions in which people are born, grow, live, work and age that shape health. Socio-economic status, discrimination, education, neighborhood and physical environment, employment, housing, food security and access to healthy food choices, access to transportation, social support networks and connection to culture, as well as access to healthcare are all determinants of health. These factors impact social groups differently, which leads to disparities in health outcomes. In Hawaiʻi, the island geography and historical context has given rise to great diversity at the local community level. Different communities face unique challenges related to access to healthcare, transportation, and other resources (Wong et al., 2008). Rural communities, for example, may have limited access to healthy food options and struggle to attract healthcare providers, which can further exacerbate health disparities between different groups (Yoshimura et al., 2015). Additionally, factors such as higher poverty rates, discrimination, and cultural barriers may make it more difficult for some communities to access healthcare and engage in healthy behaviors (Mau et al., 2009). Moreover, historical trauma and ongoing colonization experienced by Native Hawaiians can further contribute to poorer health outcomes (Sentell et al., 2016).

Addressing SDOH has been a key guiding principle for MQD in achieving the goals of the HOPE strategy (MQD, 2017). During the 1115 waiver demonstration period, MQD intended to develop integrated solutions that address SDOH within the context of the healthcare delivery system. To this end, MQD released a quality strategy in 2020 (MQD, 2020) that dedicated a major objective (Objective 11) to the description of various intended SDOH initiatives. Objective 11 outlined a multi-pronged strategy to assess and address SDOH needs across the population, including the development of a statewide SDOH Transformation Plan, along with aligned work plans at the health plan level that operationalize the goals of the statewide plan; identification of social risk factors through robust data collection, and linking and referring members to support supports to addressed identified risk factors; augmenting efforts to address SDOH by integrating SDOH work into the Advancing Primary Care (APC) initiative and increasing investment in SDOH through the targets set within the APC initiative; enhancing attention to health disparities through reporting and quality improvement initiatives; and incorporating SDOH efforts as feasible into MQD's VBP efforts.

Subsequent to the release of the Managed Care Quality Strategy, MQD re-procured its managed care contract in 2021 with substantial new requirements related to SDOH included within the new contracts. In 2022, MQD contracted a consultant to support the development of the Statewide SDOH Transformation Plan.

The purpose of this evaluation is to assess the extent to which health plans, MQD, and the State of Hawaiʻi are currently measuring and addressing SDOH and reducing health disparities among members. Specifically, this evaluation aims to answer three research questions: (1) What kinds of support strategies and interventions addressing the social determinants were chosen by health plans and how do these strategies translate to provider and patient behaviors? (2) In what ways did health plans develop and adopt a SDOH Work Plan within their Quality Assessment and Performance Improvement (QAPI) plans? and (3) In what ways did the State develop the SDOH statewide Transformation Plan?

Evaluation Approach

This evaluation takes a realist evaluation approach to understanding how MQD has influenced the ecosystem of strategies and interventions that address the SDOH. The research questions for this project are provided in table V.3B.1.

Table V.3B.1: SDOH Original Research Questions

RQ 3B.1: What kinds of support strategies and interventions addressing the social determinants are chosen by health plans and how do these strategies translate to provider and patient behaviors?
RQ 3B.2: In what ways did health plans develop and adopt a SDOH Work Plan within its Quality Assessment and Performance Improvement (QAPI) plan?
RQ 3B.3: In what ways did the State develop the SDOH statewide Transformation Plan?

Data Sources and Descriptions

Health Disparities Report

The Health Disparities Report was created during this waiver demonstration period with the new managed care contract in 2021. In 2020, MQD required health plans to begin submitting member-level quality measure data files that include quality measure and utilization data to support and augment efforts to conduct disparities-based analyses. These data are used by health plans within the Health Disparities Report to identify health disparities across a select set of quality measures, and to develop support strategies and interventions to target specific health disparities affecting their member populations. The Health Disparities Report focuses on HEDIS measures, which are already gathered and reported by the health plan in four areas within which health disparities may exist: (1) Cancer screenings, specifically breast cancer screening; (2) Access to preventative pediatric care for children and adolescents, as measured by the Early and Periodic Screening, Diagnostic, and Treatment (EPSDT) Screening Ratio; (3) Early intervention for mental illness and substance use, including Follow-Up After Hospitalization or ED Visit for Mental Illness or AOD Abuse or Dependence, Engagement with AOD Abuse or Dependence Treatment, and Depression Screening and Follow-up Plan; and (4) Plan All-Cause Readmissions. Within the report, health plans are required to stratify these data across race/ethnicity, members for whom English is a second language, geographical region, and members living with and without serious mental illness in order to identify disparities across these four dimensions. Next, health plans are asked to select three disparities they identify in their reports, justify their selection, and develop interventions to address and mitigate these disparities. Health plans continue to report on the progress and results of the interventions they selected throughout the calendar year. The report rotates to a new measurement year of data for the same HEDIS measures in the following year and the quality improvement cycle restarts.

Quality Assessment and Performance Improvement Program (QAPI)

MQD has developed and maintained a Medicaid Quality Strategy for the state of Hawaiʻi as a comprehensive program built on continuous quality improvement; the most recent revision to the Quality Strategy was completed in 2020. As part of the Quality Program, and in conjunction with the new managed care contract in 2021, MQD developed and implemented a revised data-driven, outcomes based, continuous Quality Assessment and Performance Improvement Program (QAPI) report requirement for its health plans. The QAPI report requires health plans to report on the progress of their QAPI plan; and focuses on rigorous outcome measurement of relevant targets that are matched against specified benchmarks, and supports providers and beneficiaries in advancing quality goals and health outcomes. This process includes considerations for tracking outcomes and addressing deficiencies when improvement is not occurring. The QAPI aims to meaningfully demonstrate alignment with MQD-developed plans. It covers all demographic groups, care settings, and types of services. With the QAPI, health plans are expected to address the delivery and outcomes of clinical medical care, behavioral health care, member safety, and non-clinical aspects of service, including the availability, accessibility, coordination, and continuity of care.

The QAPI report is a critical resource used by MQD to ensure population health management, including the capability to identify subpopulations (for example, by race, ethnicity, primary language or special populations) experiencing disparities. The health plan’s QAPI plan is required to clearly describe such capabilities as:

- The established practice guidelines, policies and procedures that support utilization management.
- The established mechanisms for the use of predictive analytics to identify populations at risk for poor health outcomes and high cost, stratify and report metrics at the state and regional or service area level, by subpopulation and at the patient or provider level.
- The established mechanisms for detecting and addressing both under-utilization and over-utilization of services.
- The established mechanisms for assessing and addressing care furnished to populations with special health care needs, members enrolled in Dual Special Needs Plan (D-SNPs), and members using long-term service supports.
- The evidence-based approaches to Performance Improvement Projects (PIPs), including alignment and collaboration across health plans.

Health plans collaborated with DHS, other state agencies, and as needed, with other health plans, to develop and implement a SDOH work plan within their QAPI plans that adopts a whole-person-care approach through the provision of SDOH resources at the community and member levels. Health plans include information about their SDOH work plans within their QAPI reports; SDOH work plans are evaluated by the second research question.

Social Determinants of Health State Transformation Plan

In 2022, MQD developed a Social Determinants of Health (SDOH) Transformation Plan in partnership with various community partners and providers including, but not limited to, its health plans. This plan represents MQD’s strategy to identify, evaluate, and reduce, to the extent practicable, health disparities based on age, race, ethnicity, sex (gender when available), primary language, and disability status. The SDOH Transformation Plan aims to develop a shared MQD and health plan Road Map to address health disparities comprehensively and systematically. Early implementation stages of the plan emphasize the use of analytics and analytic methods by MQD and the health plans to identify and monitor health disparities, and increase identification of unmet social needs through enhanced data collection methods. Later implementation stages focus on identifying and fortifying community-based SDOH supports, addressing social needs through referrals and resources, and targeting efforts to address the needs of populations at high risk for adverse health outcomes through socially and culturally appropriate mechanisms. Simultaneously, the SDOH Transformation Plan paves the way for the development of financial mechanisms to address and mitigate health disparities and unmet social needs.

Key Informant Interviews conducted with Health Plans

The initial evaluation plan proposed to conduct 25 qualitative, in-depth interviews with stakeholders chosen from the health plans to enquire about their SDOH strategies and interventions. Instead, evaluators conducted Key Informant Interviews to allow for greater flexibility of interview topics. Key Informants are individuals who are particularly informed about the SDOH Health Disparities reports for each of the health plans contracted with MQD. The loosely structured interviews rely on a list of issues or questions based on review of the quantitative data contained in the Health Disparities reports. The conversational approach to Key Informant Interviews allows for a free flow of ideas and information in a structured setting. Interviews were conducted in 2023. Fifteen Key Informants were interviewed, from four of the five health plans contracted with MQD.

Topics raised by Key Informants include the reliance of health plans upon community partners who understand the effective means to engage vulnerable population and increase access to care, and difficulties in accurately describing vulnerable populations using the existing demographic categories. The latter issue is especially pertinent in Hawaiʻi, where many individuals conceive their identity using highly specific ethnic and racial descriptions. Discussion of the former issue pertaining to health plans' relationships with community partners identified that information privacy policies required for transmission of the sensitive information that comprises health records creates barriers to coordinated engagement with individuals whose needs are identified by community partners. Further opportunities to collaborate with MQD in alignment of SDOH concepts were also requested.

Hawaiʻi Med-QUEST SDOH Initiatives: Current State Assessment and Resources

In preparation for the SDOH Transformation Plan, MQD conducted a statewide assessment to detail SDOH initiatives in progress in Hawaiʻi; the assessment helped influence the development and content of the State Transformation Plan. Details around the process and findings of the assessment will be described in the results of evaluation research question 3.

Data Analysis

This section of evaluation relies on qualitative data. The evaluation team members reviewed three documents mentioned in the data source section and analyzed the data using thematic coding based on the research questions. Each document was coded independently by at least two members of the evaluation team. The evaluation team met regularly to debrief and discuss the coding process and to resolve any concerns or inconsistencies. The evaluation team identified exemplar quotes of themes and included these within the outputs section.

Results

In this section, we first describe health disparities and their root causes that are identified by health plans and guide HPs’ program development to address health disparities. We then present three subsections—strategies and interventions addressing SDOH, adoption of SDOH work plan, and development of the statewide SDOH Transformation Plan, to answer the three research questions respectively.

Health Disparities in Hawaiʻi

To guide the development of work plans that target existing health disparities, the Health Disparities Report first asked health plans to report on several outcome measures across areas of potential disparity, including among racial/ethnic groups, geographical regions, groups with different language abilities, and people with serious mental illness. These disparities were examined across the utilization of several health services, including screening for depression and follow-up plan (18–64 years), adults' access to preventive/ambulatory health services, breast cancer screening, Early and Periodic Screening, Diagnostic and Treatment (EPSDT), initiation and engagement of alcohol or drug (AOD) abuse or dependence treatment, and plan all-cause readmissions. These results were used by health plans to guide the development of special programs targeting health disparities.

Across health plans, patterns of disparities emerged:

- Members identifying as Native Hawaiian, other Pacific Islander, Filipino, and White had lower utilization of preventive health services, breast cancer screening, and follow-up after hospitalization for mental illness compared to other ethnic and racial identity groups. Members identifying as Japanese, Filipino, and Chinese had higher rates of screening for depression across age groups compared to other ethnic and racial identity groups.
- Members for whom English is not their first language (ESL) had lower utilization of preventative health services, fewer EPSDT screenings, and reduced rates of initiation of substance use disorder treatment compared to members for whom English is their first language.
- Rural communities (i.e., Hanalei/Kapaʻa, Lānaʻi/Molokaʻi, Lihue/Waimea, Nanakuli/Waianae, North Shore Oʻahu, North Shore/Upcountry Maui, South Hawaiʻi) reported fewer breast cancer screenings and EPSDT screenings compared to more urban communities. However, other disparities existed across specific neighborhoods regardless of urbanicity. For instance, initiation of AOD abuse or dependence treatment occurred at lower rates for some urban areas (i.e., Aiea/Pearl City/Waipahu, Downtown/Waikiki) and rural areas (i.e., Hanalei/Kapaʻa, Lānaʻi/Molokaʻi, Nanakuli/Waianae), thus highlighting the need to take a fine-grained approach to geographical service disparities.
- Individuals living with serious mental illness (SMI) also showed higher rates of plan all-cause readmissions and lower utilization of initiation and engagement of AOD treatment compared to members not living with SMI.

Potential Root Causes of Health Disparities

health plans were also asked to describe potential root causes of health disparities within the Health Disparities report. Among the potential root causes of health disparities that health plans identified, several patterns of SDOHs were highlighted including:

- Lack of transportation
- Language barriers
- Cultural beliefs about health services
- Limited health literacy skills
- Unstable housing or homelessness
- Unemployment, having to work multiple jobs, or jobs with unreliable schedules
- Lack of daycare support for parents
- Discrimination

- Stigma of mental illness in the community
- Healthcare access and quality

Several health plans emphasized that their patients had to forgo healthcare due to a lack of transportation or not being aware of the availability of transportation services. For example, one health plan noted that:

> *"Health Center A reported getting calls regularly from patients who need to cancel their appointments or postpone their appointments because they just can't find transportation to the clinic. Because of this, these patients either have important health care delayed, or, in some cases canceled altogether. Public transportation is extremely limited, and access to Medicaid-paid transportation is also limited on these islands."*

Another significant SDOH contributing to health disparities among members were language barriers and cultural beliefs about health services, and their impact on limited health literacy skills. Health plans noted several barriers that stemmed from language barriers or cultural beliefs about health services:

> *"Language barriers and a lack of cultural understanding and norms, among other social need disparities, have prevented many from getting the care they need. These barriers have made chronic disease awareness, education, and understanding of treatment options very difficult among these populations, which creates and sustains health disparities in our community."*

> *"For Samoan women, important predictors for obtaining a mammogram include access to care, knowledge about risk factors and screening guidelines, psychosocial factors, and culture-specific beliefs. It is likely that access to care and health education, combined with culture-specific beliefs and mistrust of the health system contribute to disparities in screening rates."*

health plans agreed that experiencing housing instability or homelessness is often associated with barriers to accessing healthcare or causes disruptions to services already initiated. Health plans indicated that regions with geographical health disparities were overlapped with regions with high homelessness rates.

> *"In this region, there is a high percentage of members who are homeless while experiencing a substance use disorder, creating additional social barriers to accessing care."*

> *"It is difficult to quickly identify and coordinate with members who need to initiate and stay engaged with treatment, particularly members who are difficult/unable to locate such as those who are homeless."*

Multiple causes regarding healthcare access and quality were identified by health plans, such as long travel distance to the healthcare provider, lack of availability for appropriate services, limited appointment availability, lack of care coordination, and healthcare system inconsistency.

> *"Results from our outreach revealed that members did not want to switch from their assigned PCP due to the provider's multiple clinics being in close proximity to member homes/working locations."*

> *"Appointments are not always available to complete EPSDT screenings [in a] timely [manner]."*

> *"Services at the clinically appropriate level of care may not be readily available when the member does reach a stage of change and is ready to take advantage of services."*

In summary, as part of the Health Disparities report, the health plans provided data on health disparities across specified domains and identified a breadth of potential root causes leading to these disparities. Common themes emerged across reports submitted by health plans and serve as an encouraging first step in monitoring health service disparities. These data and root causes were used as the foundation for developing support strategies and interventions to address SDOH, detailed below.

Strategies and Interventions Addressing SDOH

This section aims to answer the research question 1: What kinds of support strategies and interventions addressing the social determinants are chosen by health plans and how do these strategies translate to provider and patient behaviors?

health plans described support strategies and interventions addressing SDOH in their SDOH work plan within QAPI reports and Health Disparity Reports, which provide answers to the first evaluation question.

Strategies and Interventions Identified in SDOH Work Plans

Health plans have begun to work on SDOH workplans within their QAPI plans. As part of this work, specific quality activities were proposed or implemented across multiple levels to address SDOH, including for members and health plan employees, and at the health plan systems level.

In total, 24 quality activities were reported across health plans. At the member level, two health plans proposed or implemented quality activities focusing on homelessness, including programs that focus on landlord engagement and triage for unsheltered members. The landlord engagement program enrolled 31 landlords, housed 108 chronically homeless veterans, and assisted 146 homeless veterans. Triage for unsheltered members vetted 592 members for participation in outreach, connected 469 to next step resources, and housed 19 members. Three health plans proposed or implemented quality activities focusing on food insecurity, including programs that provide members in need with meals, produce, or financial supplements to ensure proper nutrition. Health plan 5 provided monthly food credit and transportation to the grocery store for 15,400 Dual-Eligible Special Needs Plan (DSNP) members. Health plan 3 provided meals for low-income pregnant women and new moms, and provided fresh produce for those who are food insecure. Additional member-level activities described by health plans focused on reducing emergency department utilization, promoting maternal health, providing educational opportunities for members (e.g., high school equivalency certificate program), developing programs to provide Native Hawaiian traditional practices (e.g., lomilomi, hula, ho'oponopono), encouraging COVID-19 recovery efforts targeting Native Hawaiian and Pacific Islander communities, improving access to information about social services, and addressing social isolation.

At the health plan employee level, SDOH training for staff was proposed by one health plan. At the health plan system level, two health plans proposed quality activities that aimed to develop a system to screen and document SDOH data and improve coordination of social services. Health plan 3 reported that 133 providers were enrolled in the web-based coordinated care network focusing on coordinating resources to address SDOH and treat needs of the whole person. health plan 5 established a web-based resource and referral platform and made 112 referrals to free or reduced cost, need-based social services in 2022.

Strategies and Interventions Identified in Health Disparity Reports

Support strategies and interventions implemented (or to be implemented) in the Health Disparities Reports included efforts to increase patient or community engagement and outreach; and improve health care coordination and access to health care through such interventions as providing transportation or relieving travel burden, and scheduling access to services outside of the regular weekday clinic hours.

Patient engagement and outreach activities were proposed to address root causes of SDOHs such as language barriers, cultural beliefs about health services (e.g., stigma), and limited health education and literacy skills. These activities included incentives that encourage patients to seek preventive services, creation of multi-language communication toolkits, participation in regional health fairs, and mailing campaigns containing education materials and healthcare provider information. See Table V.3B.2 for examples of patient engagement and outreach activities.

Table V.3B.2: Example Patient Engagement and Outreach Activities for SDOH

Example Patient Engagement and Outreach Activities
Health plan 1 will implement an engagement strategy with members and providers in which members are incentivized with a $25-dollar gift card for completing the well child visit, and office staff are incentivized for outreach associated with successful attendance of well child visits.
Health plan 2 will employ a Motivational Interviewing approach to encourage members to access services, utilizing Certified Substance Abuse Counselors and Certified Peer Support Specialists as part of a member engagement strategy.
Health plan 4 has preliminarily developed a disparity toolkit for the Filipino population. The toolkit provides an evidence-based framework for use when communicating directly with members (in-person, over the phone, and via email), developing materials (written, electronic, and recorded), and developing interventions. Components of the toolkit includes messaging checklists for use when developing educational materials for members, intervention recommendations when developing programs, and multicultural messaging charts
Health plan 5 will run a ‘Pink Ticket’ mailing campaign targeting eligible members from underperforming regions who did not complete a breast cancer screening in 2022. The mailer will educate members on the importance of mammography and will encourage them to schedule a free mammogram with a provider. It will also offer tips on how to prepare for a mammogram and will provide the address and contact information for imaging centers or facilities that are convenient to the member’s location.

Each health plan also described interventions that focus on collaboration with communities, community-based organizations, community health workers, and peer-support specialists. These community-based interventions integrated programs that improve patient engagement and health coordination. The collaboration with communities was proposed to address SDOH with the intent of addressing the following community-level challenges: (1) Ethnic communities and community leaders often have significant cultural, social, and language capital, including trust with patients, which may be key to engaging patients within groups that experience health disparities; (2) navigation and coordination services supported by communities expand access to healthcare for patients, and may address root causes such as lack of availability to appropriate services, limited appointment availability, and healthcare system inconsistency. See Table V.3B.3. for examples of health plan community-based engagement activities.

Table V.3B.3. Health Plan Community-Based Engagement Activities

Health plan Community-Based Engagement Activities

Health plan 2 is partnering with community health clinics to create a Community-Based Chronic Kidney Disease Care Management Program. This effort intends to reduce disparities for Native Hawaiian and Pacific Islander (NHPI) communities. The most crucial component of this effort will be utilizing Community Health Workers, Patient Navigators, Interpreters, Health Educators, and other support specialists from NHPI communities.
Health plan 3 is partnering with community health clinics and CIS providers as part of a member engagement strategy given the number of homeless individuals with co-occurring substance use disorders.
Health plan 3 is identifying members due or overdue for breast cancer screening and scheduling them for mammogram appointments. Planning includes partnering with different community organizations to provide education on different health related topics.

Lastly, other interventions focused on expanding existing service options, including providing transportation or mobile services, promoting awareness of transportation benefits, and expanding services outside of the regular weekday clinic hours, see Table V.3B.4.

Table V.3B.4. Health Plan Service Expansion Activities

Health plan Service Expansion Activities
Health plan 2 has partnered with a community health center to provide a van and non-emergency medical transportation program that will support closing the transportation gap on the island.
Health plan 3 is piloting Saturday Health Fairs to provide access to services outside of the normal Monday-Friday clinic hours
Health plan 5 has developed a mailer that includes information about the non-emergency medical transportation benefit available for members who have no other transportation options available

Overall, health plans proposed several support strategies that target patient engagement, community engagement, and service expansion in order to address some of the root causes of health disparities noted above. Some support strategies specifically target disparities identified in the data from the Health Disparities Reports (e.g., expanded outreach for breast cancer screenings, incentives for EPSDT screenings), while others target root causes identified by health plans (e.g., transportation, scheduling).

Adoption of SDOH Work Plan

The following themes are summarized to answer research question 2: In what ways did health plans develop and adopt a SDOH Work Plan within its Quality Assessment and Performance Improvement (QAPI) plan?

The health plans' SDOH work plans were submitted as a component of the QAPI plan, and each plan specified timelines, benchmarks, milestones, and deliverables. The health plans' initial SDOH work plans were required to include:

- Plans for increasing the systematic collection and documentation of member-level SDOH data through screening.
- Plans for promoting the use of the International Classification of Diseases Tenth Version (ICD-10) Z codes for SDOH documentation.
- Plans to increase provider understanding of SDOH.
- Plans for incorporating SDOH strategies into the overall QAPI by:
  - Linking beneficiaries to identified SDOH needs; and

    - Providing relevant SDOH value-added services offerings.
- A description of how the health plans directly address and adapt their QAPI to accommodate SDOH needs for the following target populations:
    - Special Health Care Need (SHCN), Expanded Health Care Need (EHCN), and LTSS populations, including adults and children, for whom social needs have been identified through the SHCN, EHCN, and LTSS assessment;
    - CIS populations; and
    - Other populations with complex physical, behavioral, and social conditions.

The evaluation team reviewed quality activities identified by health plans in their SDOH work plans and evaluated how the quality activities meet the requirements for the initial SDOH work plans.

Systematic Collection and Documentation of Member-Level SDOH data

Health plan 2 and health plan 4 implemented three quality activities that aimed to systematically collect and document member-level SDOH data through screening. For example, health plan 2 indicated that they are leveraging available data to proactively identify members may be experiencing one or more social risk factors in order to link them to interventions. Additionally, the health plan indicated that they created an SDOH Flag to prompt providers to ask members SDOH-pertaining questions regarding their living situations and access to food, every 6 months.

International Classification of Diseases Tenth Version (ICD-10) Z Codes for SDOH Documentation

Health plan 3 identified an initiative to promote the use of ICD-10 Z codes for SDOH documentation for CIS members. The initiative started with screenings on homeless members first and where appropriate, referral of members into the CIS workflow. Collaborating with primary care providers and educating providers/clinical partners about this process are also included in this initiative.

Increase Provider Understanding of SDOH

Along with promotion of ICD-10 Z codes for SDOH documentation, health plan 3 also provided annual trainings to educate providers and clinical partners on this process. Health plan 3 aimed to raise awareness and build the SDOH documentation into workflows. Another activity by health plan 3 built a web-based coordinated care network to connect health care providers and social services providers and enrolled 78 providers in the network. This network focuses on coordinating resources to address SDOH and treat the needs of the whole person, which is naturally expected to increase providers' understanding of SDOH. As previously described, health plan 5 established a web-based resource and referral platform and made 112 referrals to free or reduced cost, need-based social services in 2022.

Incorporating SDOH Strategies into the Overall QAPI

As described in above section “Strategies and Interventions Identified in SDOH Work Plans,” health plans incorporated SDOH strategies in the QAPI reports by initiating quality activities at multiple levels to address SDOH, including for members and health plan employees, and at the health plan systems level.

Those quality activities focused on homelessness, food insecurity, reducing emergency department utilization, promoting maternal health, providing educational opportunities, providing Native Hawaiian traditional healing practices, encouraging COVID-19 recovery efforts targeting vulnerable communities, improving access to information about social services, and addressing social isolation, SDOH training for staff, and the development of a system to screen and document SDOH data.

Accommodate SDOH Needs for Target Populations

Among quality activities to address SDOH in the work plan, activities focusing on reducing emergency department visits among homeless individuals attempt to address SDOH needs for target populations, including members enrolled in SHCN and CIS. For example, health plan 3 initiated a COVID-19 homeless triage and transfer program that provided public health outreach to the most vulnerable unsheltered homeless. Health plan 1 initiated an “ER high needs program” for members with high needs but without regular primary care source and/or connection to community supports.

Additionally, the evaluation team also identified themes such as health plans’ understanding of social risk factors, their collaborations with other parties to address SDOH, and the measurement of their progress in addressing SDOH.

Social Risk Factor (SRF) Understanding

health plans appear to have a clear understanding of how to tie interventions to social risk factors (SRFs) when it comes to food insecurity and homelessness, in that they appear to be aware that experiencing housing and food insecurity has negative impacts on members’ health outcomes, and have proposed specific interventions to address these SRFs. Given that there is no natural bridge between the healthcare system and social services systems, there are many barriers to addressing these SRFs, and the health plans’ proposed interventions represent an important first step in implementing such a bridge. For example, some health plans are attempting to create an electronic referral process, so that a provider can prescribe/refer members to a social service (e.g., a food bank), and this referral is electronically conveyed through a bridging system to the social service provider (who reaches out to the member, provides the outreach, and communicates back with the provider through the system). These types of systems are becoming increasingly popular, and when implemented can connect to various types of social services based on the needs of members. We look forward to health plans continuing to expand their reach in addressing social risk factors beyond food insecurity and or homelessness, such as their efforts to improve access to healthcare with providing transportation and alternative appointment times outside of the standard Monday to Friday workday to target working families and those who cannot afford transportation and/or live in rural areas in Hawaiʻi.

health plan 1 described a project that provides linkage to adult education programs for members to attain high school equivalency. This health plan specifically noted that they aim to target adult educational level as a SDOH and provide a clear link between their activity and the SDOH they aim to address. Although this example could benefit from more details about why adult educational level is linked to health outcomes, it is a clearly defined program that targets a specific SDOH.

Collaboration with other Parties

Health plans are expected to collaborate with DHS, other state agencies, and as needed with other health plans, to develop and adopt an SDOH work plan within its QAPI. Plans for collaboration with parties outside of health plans were documented in the “Contributing Partner(s)” column in the SDOH work plan. Three health plans noted collaboration with community sites (e.g., schools, community health centers, Office of Aging, Honolulu Police Department), healthcare providers (e.g., hospitals, physicians, nurse practitioners, and emergency department staff), and social services providers. Only one health plan specified plans to collaborate with another health plan. Two health plans lacked clear plans to collaborate with partners outside of their organization across any quality activities. The managed care reporting workflow provides opportunities for MQD to monitor, evaluate, and send feedback to health plans where gaps are noted to support iterative and continuous process and quality improvements.

Measurement of Progress

Although health plans were expected to develop timelines, benchmarks, milestones, and deliverables for their quality activities, only 12 (50%) of the 24 quality activities included a performance measure. Among these 12 quality activities, two quality activities did not include any follow-up data for milestones or deliverables.

Many of the indicated progress measures lack the details necessary to evaluate the fit of the measure to the quality activity. For example, for the quality activity focusing on emergency department visits, the listed performance measure is simply “ED High Needs Program” with some data that lacks adequate context for interpretation. Data driven QAPI reporting is a new concept for MQD’s health plans. Quantifying the types of activities occurring; and identifying measures that evaluate the efficacy of these activities require substantial technical assistance and support to health plans. Unlike with the CIS program, UH SSRI collaborators have not engaged in rapid-cycle assessments to support iterative improvements in understanding of MQD’s expectations for other programs.

Six quality activities reported clear quantitative measures that included a Year 1 Target, milestones, and deliverables. For example, one quality activity focused on a program that provides food assistance proposed the use of the “percent of members who used the benefit,” as the performance metric and successfully reported data across three quarters. MQD intends to build health plan capacity by building upon these types of examples of successful initiatives with clear objectives, performance measures, and targets.

Development of SDOH Statewide Transformation Plan

This section aims to answer research question 3: In what ways did the State develop the statewide SDOH Transformation Plan?

To develop the statewide SDOH Transformation Plan, MQD worked with partners to complete an assessment to (1) understand the current state of SDOH initiatives in Hawaiʻi; (2) articulate the desired future state of SDOH initiatives in Hawaiʻi; and (3) identify strategies to make progress toward that future state of SDOH initiatives in Hawaiʻi. MQD utilized interview and survey methods to collect information from several community stakeholders including health plans, hospitals, federally qualified health centers (FQHCs) and Native and Hawaiian Health Centers, community-based organizations, and state and local government agencies. This information was used to prepare the Current State Assessment and Resources document to inform the SDOH Transformation Plan.

Med-QUEST’s SDOH Transformation Plan is organized around four goals:

Screening and Referrals: Healthcare organizations and community-based service providers use validated, evidence-informed standardized screening and assessment tools to identify individuals’ health-related social needs and connect individuals to community resources;

SDOH Data and Information Sharing: Data, information, and interoperable IT systems facilitate gathering and sharing of individual health-related social needs and information on community resources at the point of care;

Community Supports: Strong networks of community-based resources to address SDOH needs, with a focus on access to health and social services benefits including housing, financial assistance, and nutrition; and

Payment and Funding: Incentives, value-based payments, and braided resources that support SDOH work.

Regarding the first goal, the assessment recommended enhancing SDOH information sharing, providing standardized tools and additional guidance, and expanding SDOH screening domains and population screened. The SDOH Transformation Plan identifies key strategies to support health plans in expanding, enhancing, and aligning SDOH screening and referrals. Planned support include providing billing and coding guidance on social risk factors screening and referrals and including SDOH screening domains in the Health and Functional Assessment.

For the second goal, health plans recognized a need for a centralized approach to gather and share SDOH information to streamline data collection, referral sharing, and service navigation. Priority activities included: (1) Development and submission of a Planning Advanced Planning Document (PAPD) application to support a planning period to gather information and test the feasibility of data exchange platform options that encompass SDOH information; (2) Development of guidance based on national best practice to support the collection of race, ethnicity, and language (REL) and sexual orientation, gender identity, and expression (SOGIE) population and subgroup data; and (3) Development of resources to support health plans to develop evidence-based interventions to address health disparities identified through the health plan Health Disparities Report.

Regarding the third goal, stakeholders recognized a need for the development of referral workflows and payment models that balance the different operational needs of healthcare and social service providers. The SDOH Transformation Plan identifies strategies to strengthen the CIS program and expand access to other social services and public programs. MQD noted a commitment to working with health plans and provider partners to implement programmatic operational changes to support successful implementation of CIS, and work with community partners and other state agencies to identify opportunities to strengthen connections with social services and public programs that address SDOH needs.

For the fourth goal, the key strategy is to expand opportunities to leverage Medicaid funding and development of payment incentives to support SDOH services and the delivery of integrated care that addresses an individual’s social and health needs. Three priority activities identified include: (1) the expansion 1115 demonstration authority to pay for SDOH services and interventions via the renewal process (that MQD is seeking as part of the 1115 waiver renewal process); (2) support for health plans’ ability to utilize in Lieu of Services (ILOS) benefits to meet SDOH needs; and (3) sustain and expand existing hospital SDOH pay-for-performance opportunities.

Conclusions and Recommendations

There has been an increasing interest in understanding how the social determinants of health interact with health and healthcare; a growing body of literature has demonstrated a causal connection between the presence of social risk factors and poor health outcomes. Medicaid agencies by their very nature target and serve populations that are disproportionately impacted by social risk factors that put them at risk for higher morbidity and mortality. Therefore, it is unsurprising that Medicaid agencies are leading the way nationwide in attempting to implement strategies that seek to identify, address and mitigate these additive negative impacts on the health and cost of care for their populations. A related concern is the impact of health disparities on health outcomes, where certain subpopulations (typically differentiated based on one or more demographic characteristics such as race, geography or language; but also based on the presence of one or more social risk factors) experience relatively poorer health outcomes. For Medicaid agencies, it is important to be aware of the sociocultural contexts within which healthcare is delivered, and the need to intentionally focus on efforts to reduce healthcare disparities through a variety of methods.

The National Academies of Sciences, Engineering, and Medicine (NASEM, 2019) proposed a framework for integrating social care into the delivery of healthcare that focuses on (1) improving Awareness of social risk factors through increased screening in the healthcare setting; (2) utilizing SRF data to make Adjustments as appropriate to clinical regimens; (3) providing patients Assistance by linking/referring them to additional services to address their social needs; (4) achieving Alignment across community settings and organizations to mitigate emerging social needs; and (5) supporting healthcare organizations and social care organizations in engaging in Advocacy to promote policies that support greater coordination and alignment of systems of care to prevent the emergence of unmet social needs.

This qualitative analysis sought to evaluate three research questions that focused on the Hawaiʻi Medicaid program's progress in addressing SDOH during the current 1115 waiver demonstration period. The three questions focused on MQD's implementation of the statewide SDOH Transformation Plan (RQ.3); MQD's translation of its SDOH goals into its managed care contract and subsequent requirements for its health plans to develop and adopt SDOH Work Plans (RQ.2); and the actual work to date by Health Pans in implementing a variety of strategies and interventions on the ground that support SDOH efforts in general, and additionally attempt to reduce identified health disparities (RQ.1).

Overall, information gathered from a variety of reports indicate MQD and its health plans have conducted substantial planning and begun to implement a variety of strategies to address SDOH across multiple levels, including the patient-, provider-, health plan- and systems-levels. During the demonstration period, MQD successfully included a number of SDOH requirements into the health plans' managed care contract that was reprocured in 2021; implemented a new QAPI report that requires data-driven evaluations of the health plans' QAPI including but not limited to their SDOH Work Plans; implemented a new Health Disparities Report that requires health plans to identify and implement interventions to address health disparities across a series of quality metrics stratified by multiple demographic dimensions; and worked with partners statewide to implement a SDOH Transformation Plan that includes a roadmap for continued work to support SDOH efforts at multiple levels of the healthcare system.

Through our investigation, the evaluation team learned of several interventions and support strategies identified by both MQD and health plans to address the root causes of SDOH, improve data collection and outcome measurement, and implement interventions that mitigate identified social needs. However, the majority of these activities remain in planning and have not yet been implemented; and of those activities that are implemented, the quality, depth, and breadth of such strategies varied significantly. Nonetheless, it is heartening that much work has begun and effective planning for additional work has been completed.

In their Health Disparities Report, most health plans successfully identified pockets of disparities across all the measures evaluated (including breast cancer screening, all-cause readmission or adult's access to preventive/ambulatory health services, and initiation/engagement of alcohol and other drug abuse dependence treatment). These varied by geographical regions and race/ethnicity, with substantial disparities identified among NHPI and Filipino populations. Health plans identified several health disparities in the utilization of health services by members for whom English is a second language, and among members living with serious mental illness.

However, when asked to identify the root causes of these disparities, details regarding the etiology of the disparity were often lacking. For example, health plans noted that issues such as discrimination or homelessness often overlap with health disparities, but they did not explain how discrimination or homelessness might cause health disparities. Moreover, the interventions that health plans implemented were often limited and generally not at a systems level. For example, some health plans addressed transportation barriers by providing a van, but they did not have adequate financial support to sustain it and reach many rural/urban regions in the state. Another health plan opened Saturday Health Fairs to increase access to breast cancer screenings and adolescent wellness checkups, due to many members not being able to go to appointments during the weekdays; however, this intervention does not address the issue at a systems level.

Health plans highlighted differences in cultural practices/beliefs and how that could be related to mistrust in healthcare providers, but solutions were more focused on language barriers and relying on community partners to help. Healthcare coordination was mentioned as an issue, especially for those with serious mental illnesses and experiencing homelessness, but the health plan's solutions were not outlined specifically at this stage. Thus, although the health plans proposed several projects to target SDOH, it is unclear the extent to which they target SDOH via underlying root causes. The evidence-based interventions that were described were often somewhat limited, preliminary, and needed more funding to continue or be successful. Progress tracking was often delegated to the community partners rather than performed primarily by the health plans themselves. The health plans were concerned about SDOH and wanted to better educate providers and inform members about the importance of screening as an intervention to increase access to healthcare and improve health outcomes.

Regarding the QAPI plan, health plans similarly identified several projects to target SDOH at the member, provider, and health system level. The focus areas covered a rich range of SDOH, including housing and homelessness, food insecurity, education, cultural factors, and social isolation. However, similar to the strategies noted above, the root causes of these SDOH were often unclear or lacked detail. Additionally, the quantitative measures selected to track the effectiveness of these interventions were only reported for half of the projects, and often reflected engagement in the program rather than specific health-related outcomes that would reflect the effectiveness of the intervention.

For health plans to identify interventions that effectively target social determinants of health, it will be important for them to accurately and specifically identify and define the mechanisms of these root causes. There may be a role for rapid-cycle assessments (RCAs) and other strategies to support health plans in evolving their understanding of SDOH and in brainstorming innovative solutions to address the issues identified. Further, health plans may learn from examples of effective interventions in the context of collaborative learning communities.

In summary, while SDOH have a strong impact on health outcomes, and addressing them in the context of healthcare is important, the implementation and operationalization of these important priorities into strategies, initiatives, and activities is new and underdeveloped. Data driven approaches to measuring performance and evaluating the impact of interventions also represent an area of emerging knowledge. MQD has established a clear pathway to implementing SDOH interventions for Hawai'i's Medicaid Program, and required itself and its health plans to operationalize initiatives with demonstrable efficacy. Tremendous progress has been made, and work to impact SDOH has begun at multiple levels. Continued and consistent effort is needed for MQD to realize the potential of the work that has begun. Additional resources including investments in systems, and opportunities for shared learning and collaboration are needed, to support the state's ability to successfully address SDOH as part of its overall HOPE initiative.

Lessons Learned and Future Recommendations

MQD's intention to promote SDOH initiatives with data-driven quality improvement has been clarified, however, the health plans continue to struggle to understand and meet these expectations. The evaluation team recommends the inclusion of RCAs to strengthen the formative evaluation of managed care delivery system across various key areas of the 1115 waiver demonstration, particularly in novel areas such as SDOH where health plan experience is limited. Given that it is a new expectation for health plans to identify and address specific root causes of SDOH, it is recommended that they be provided with common resources to educate staff about SDOH, including the most prevalent SDOH impacting members in Hawaiʻi, research on root causes of SDOH, and evidence-based interventions for addressing SDOH.

More resources need to be provided at the state and federal levels to aid health plans in selecting outcomes measures that adequately indicate whether a particular intervention is effective in addressing the root causes of SDOH. As a next step, health plans are encouraged to communicate more with each other to address SDOH and identify more effective, evidence-based strategies and interventions. Also, member-level data collected over longer periods of time, rather than only quarterly or over one year, will lead to better tracking of health disparities and the effectiveness of interventions for different groups and locations. Data privacy issues need to be addressed carefully to help health plans collaborate with community partners to better serve the needs of their members.

Overall, the SDOH State Transformation Plan is a vital step to improve population health and health plans are becoming more informed, so they will be better positioned to improve access to health care and the quality of care for their members.

VI. Conclusion

In this concluding chapter, we bring together the key findings and insights from the Medicaid demonstration evaluation. The evaluation focused on six priority areas including (1) Primary Care, (2) Care Coordination for Beneficiaries with Complex Conditions, (3) Home- and Community-Based Services, (4) Value-Based Purchasing, 5) Community Integration Services, (6) Social Determinants of Health.

We offer a summary of the main findings for each priority area as well as two overarching lessons learned throughout this demonstration period focused on reporting and measurement developments on the one hand and outcomes on the other.

Main Conclusions by Priority Area

Primary Care

First, Med-QUEST (MQD) developed several novel and useful operational definitions to track primary care spending and set targets for additional investments (i.e., primary care visits, beneficial primary care services and primary care supports). Overall, spending and utilization of primary care services decreased during the waiver demonstration period, however, this decrease was not uniform across categories. Spending reduced significantly more than utilization, with spending per primary care visit remaining relatively steady, likely the result of the Primary Care Provider-Enhancement program's stabilizing effects on the rate of reimbursement per visit. Primary care visits were linked to an increase of several preventive care quality metrics, including increased adults' access to preventive services, well-child visits, and optimal comprehensive diabetes care. Effects of beneficial services and supports however, will need more time to materialize due to the noted delay in the impact of the outcomes. Results show support for efforts taken by MQD to increase the use of valuable primary care services, and encourage a continued investment in this area.

Health Coordination Services (Expanded and Special Healthcare Needs)

Second, continuous, multi-year engagement with health coordination services (HCS) was associated with increased home health and primary care services expenditures, lowered inpatient and emergency department utilization and emergency department cost. However, a high proportion of individuals eligible for and enrolled in HCS, including expanded and special health care needs populations, were not continuously engaged in services, underscoring the need to develop long-term engagement strategies. Although these results are derived from a single health plan, they suggest HCS has the potential to shift spending and utilization from emergency services to primary care and home health services for populations with high health needs.

Long-Term Services and Supports / Home- and Community-Based Services

Third, evaluation of home- and community-based services (HCBS) demonstrated that members receiving At-Risk services and those residing at home stayed longer in community dwellings, had higher goal attainment, and lower total cost of care. Long-term services and supports-receiving members with similar level of care scores, age, and sex at baseline who were in home settings had a substantially lower rate of functional decline over time than those in community-care foster homes or nursing homes. There appear to be benefits to in-home care that may surpass those realized with care provided in community-care foster homes, which mirrored outcomes observed in nursing homes. Furthermore, the likelihood of placement in diverse settings varied widely by level of care and diagnosis, suggesting the need for greater in-home supports for people with higher functional needs. These findings suggest that continued investment in At-Risk and HCBS will assist in rebalancing efforts while promoting longer community integration tenures.

Value-Based Purchasing

Fourth, we found that health plans are increasingly successful in meeting benchmarks set by MQD in its pay for performance program. Health plans have designed and implemented several value-based purchasing (VBP) programs aimed at improving health outcomes in line with MQD intentions. At this time, most initiatives implemented by health plans are focused on primary care. Most VBP arrangements are based on a fee-for-service payment structure, with only two initiatives incorporating risk-based payments. Seven arrangements include population-based payments, specifically including per-member, per-month payments. These population-based arrangements are generally aimed at providing supplemental payments that go beyond the prevailing reimbursement model as incentives for providing care to high risk, complex-needs populations, and do not yet extend to comprehensive, integrated population payments for the full member population. Efforts by MQD to develop basic functional concepts for VBP programs and disseminate this information to health plans have been successful. More work is needed to identify successful elements across initiatives and promote the use of these elements across health plans; and encourage or incentivize the development of more innovative VBP programs targeting different provider types and quality outcomes.

Community Integration Services

Fifth, findings suggest that the community integration services (CIS) program has benefited from evaluation rapid-cycle assessments (RCAs). CIS has undergone major, necessary programmatic changes in order to effectively serve members and to adapt to local system needs. Health plans are identifying the intended population for CIS (i.e., members with high total costs of care and who are high utilizers of emergency services); however, many of those members have yet to receive services due to backlog and lack of Homeless Service Provider capacity. Much of the data health plans reported to MQD does not yet capture important short-term goals related to housing, and long-term outcomes are still being monitored. Additionally, clearer definitions of ‘housing stability’ are needed, as long-term goals and impacts such as reduced cost of care rely on members achieving this status. Ongoing efforts to improve data collection will allow for monitoring of members receiving CIS services and impacts on health outcomes and total expenditures as the program matures.

Social Determinants of Health

Sixth, information gathered from a variety of reports indicates that strategies have been identified to address social determinants of health (SDOH) and eliminate health disparities across multiple levels, including patient-, provider-, and system-level interventions. However, the quality, depth, and breadth of such strategies varied significantly by health plan, suggesting a need for education and enhanced technical assistance. Finally, MQD took a community participatory, multi-stakeholder approach to develop the State’s SDOH Transformation Plan which will allow a coordinated and systematic approach to eliminating health disparities statewide.

Lessons Learned and Future Recommendations

Across the different programs and initiatives started during this demonstration period, we can draw two main lessons.

1. **This demonstration period initiated significant collaborations between MQD, health plans, and the evaluation team to transform program development, improvement, measurement and reporting in all priority areas**

MQD used this demonstration as a vehicle to implement the Hawaiʻi ʻOhana Nui Project Expansion (HOPE) Initiative. MQD made strong developments in measurement and reporting for this demonstration period across all priority areas. Prior to this demonstration, health plans were generally not required to collect or report member-level data beyond administrative encounter data. Collaborative fora in which to discuss challenges, prepare strategies for process/program improvements, and learn about data-driven approaches were not typically employed. Transitioning to a robust data collection system required MQD, health plans and UH SSRI to engage in substantial collaboration, as well as capacity-building and coordination. The implementation of collaborative RCAs for CIS created the foundation for establishing shared learning and program improvement models for other novel initiatives implemented by MQD. These strategies may lay a foundation for robust data culture and reporting strategies which integrate data-driven decision-making over future demonstration periods and into the long term. Below, we outline some of these advancements.

First, in the area of primary care, innovative definitions of primary care were developed to track increased utilization of high-impact primary care services and reduction of low-value services, and health plan reporting mechanisms were developed in accordance with these new definitions. As health plans become familiar with these new definitions as well as reporting the care provided, it will become easier for health plans and researchers to monitor process and outcome developments continuously over the course of years.

Second, in the area of care coordination, health plans in collaboration with members of the evaluation team and MQD set up the first reporting and evaluation collaboration for the 1115 waiver evaluation. Experiences in this collaboration serve to further revise reporting guidelines to improve consistency across plans with specific attention to defining care coordination and operationalization of care coordination in practice by different health plans for SCHN populations. This resulted in ongoing transformation of reporting guidelines and improved reporting quality for SCHN/EHCN and LTSS.

Third, value-based health care reports were developed to map the advancement of payment transformation to more advanced forms of reimbursements both qualitatively and quantitatively. This effort resulted in a well-defined reporting framework that allows for analysis of yearly advancement in accordance with the advanced payment model (APM) Framework. Improvements in provider attributions to VBP programs and lessons learned from attributing members to different providers participating in these programs will provide a data infrastructure that will support robust evaluations in the future to provide essential analysis of ongoing payment transformation.

Fourth, RCAs were implemented for CIS, allowing for speedier data collection and regular feedback to stakeholders, which promoted iterative refinement of the program. The RCA proved to be a particularly useful device for the implementation of the new and innovative CIS program. Although some challenges were imposed on stakeholders and UH SSRI project collaborators due to the high turnaround demanded by the RCA, it has resulted in program improvement and increased collaboration among all stakeholders.

The benefits of RCAs may also prove useful for other priority areas in the future—providing substantial opportunities for collaborative learning as programs are developed and implemented.

Fifth, MQD and UH SSRI collaborated to improve reporting templates and to provide technical assistance to health plans. Streamlined and improved reporting templates, including key metrics identified by evaluation staff during this waiver period, will allow for ongoing monitoring of program maturation, examination of CIS processes and outcomes and refinement of ability to produce data quickly for RCAs.

Sixth and lastly, MQD developed an SDOH transformation plan including new requests by MQD to health plans on addressing SDOH. For example, under the new managed care contract, health plans are required to submit SDOH reports on health disparities and quality improvement activities. Health plans also developed and adopted an SDOH work plan within the Quality Assessment and Performance Improvement Program (QAPI) plan which is used to monitor the impact and progress of SDOH quality improvement activities.

Reports, measurements, and opportunity for process evaluations through RCA made strong improvements throughout the evaluation, and health plans gained experience and familiarity with the structure of reporting. Thus, the current demonstration period served as an initiation period and groundwork for more detailed evaluation in further demonstrations. This waiver demonstration period marked the first time that health plans in Hawaiʻi were required to provide such a high volume of detailed, individual-level metrics; incorporate those data and metrics into their quarterly reports; and participate in RCAs as part of the implementation of a new program. These enhanced evaluation and monitoring needs required substantial collaboration between UH SSRI, health plans and MQD. As the reporting transformation is ongoing, the newly-established infrastructure will aid further evaluation and improvement efforts in future demonstrations, and should involve other crucial stakeholders, such as patient advisory groups and providers.

Recommendation: Continue revisiting and improving reporting and measurement methodologies, focused on reducing reporting burden while capturing crucial process and outcome metrics that align across health plans that are informed by cross-stakeholder feedback, including members and providers. Expand the use of RCAs to other novel program implementations as needed.

Recommendation: Focus on developing a systematic process for incorporating member feedback into evaluation, program development, and program improvement.

2. The impact of the investments made by health plans and MQD in the priority areas are only partially visible at the time of evaluation due to ongoing implementation efforts and multi-year theory of change timelines

The results from most of the program evaluations did not mark conclusive, significant improvements in health outcomes, utilization of care services, and spending throughout the short period of evaluation. In part this may be due to the multi-year timelines needed to examine the impact of innovative, multi-stakeholder, and systems-changing strategies of the HOPE initiative. However, some encouraging signals were already observable for members receiving HCS and HCBS, and health plan achievement of quality outcomes set in MQD’s value-based P4P program. Results indicate that continuous engagement in HCS and HCBS is associated with improved health outcomes. Also, in the realm of value-based care, health plans made advancements towards achieving higher rates of performance (i.e., improved member health outcomes) in MQD’s P4P program. For CIS, short-term outcomes suggest that the program is enrolling the intended population with significant physical and behavioral health needs; and long-term effects will be measurable in future demonstration periods. Similarly, health plans' strategies to measure and develop interventions to address root causes of SDOH are likely to lead to measurable impacts on reducing health disparities.

Nevertheless, more time and work are needed to establish effectiveness of the implemented programs as reporting of process and outcome measures improve over time. Several factors impacted our ability to draw definitive conclusions from the current data.

First, new reporting mechanisms were developed, and data quality improvement activities were ongoing during the demonstration period. Essential information such as member engagement in HCS and CIS, service providers' activities, implementation of VBP program quality development, and records of program specific outcomes such as achieving housing for CIS, were not yet collected or reported across health plans. Furthermore, inconsistencies in reporting by health plans were noticed across these programs. While these are being addressed by MQD, quality and unified reporting (with minimal administrative burden) is needed to reliably track the level of implementation over time and their relation to the intended outcomes.

Moreover, the evaluation hypotheses are broad and focused on long-term outcomes that are impacted by many factors. The effects of the various components of the demonstration are entangled, implemented simultaneously and often targeting large, overlapping populations (e.g., populations with social needs, homeless population, and LTSS beneficiaries). To meet the HOPE objectives, these components were designed to be cross-cutting and mutually reinforcing. The crossover delivery of programs engenders inability to perform random assignment of members, creating analytical challenges to the evaluation. With increased access to data reports, it will become possible to specify both short- and long-term goals for each priority area in future demonstration periods. This will allow the evaluation team to isolate effects of different programs and how they might intersect to contribute to the system-wide goal of reducing costs and improving outcomes.

In addition, most investments are aimed at long term effects that have not yet occurred in the short period during which the changes were evaluated (2019–2022). Many changes and investments were progressively implemented throughout the demonstration period, resulting in delayed occurrence of change. The evaluation team furthermore did not address all factors that contribute to health and cost outcomes such as the impact of the COVID pandemic during the evaluation period. MQD sought additional authorities and waivers of existing authorities relating to the public health emergency that may have impacted eligibility requirements, payment models, and delivery of services in specific areas such as LTSS, therefore affecting specific evaluation priority areas.

Finally, implementation of several programs is still relatively limited. In the case of SCHN/EHCN, only 15.3% of enrolled members for the health plan under study were continuously engaged and receiving services. This lack of implementation is potentially linked to case burden of individual case managers. Most health plans have described issues with capacity, and on average, health plans have reported caseloads of 100–300 members per care coordinator. Further root cause analyses are needed to identify other causes of disengagement, so that effective strategies to increase participation and engagement in these services can be implemented.

Health plans have faced several restraints in costs and available care workers during the COVID-19 pandemic that can explain limited implementation. Consequently, more investments need to be made to achieve the intended effects of the implemented programs on a larger scale.

COVID-19 impacts on implementation and evaluation

The COVID-19 pandemic and resulting public health emergency likely had a profound impact on both outcomes and the implementation. First, the pandemic is expected to have had a broad-based impact on several outcome measures of interest, affecting several evaluation priority areas (e.g., service utilization and total cost of care). This makes the impact of several interventions and programs implemented potentially invisible due to the far-reaching consequences of these unforeseen circumstances on members' health conditions, ability to seek care, and provider's restraints in implementation new forms of care provision. Second, the pandemic further aggravated an already strained access issue caused by provider shortages across the state. Third, the economic impact of the pandemic may ultimately affect the interventions implemented by health plans and MQD; this evaluation design proposes a multitude of new initiatives tied to MQD's managed care re-procurement. Larger budgetary constraints may morph or dictate MQD's decisions on how and when these interventions are implemented, further impacting evaluation design and restraints.

Concluding Remarks

The UH SSRI evaluation team greatly appreciates our collaboration with MQD and associated health plans, who collectively established and refined these innovative programs during this demonstration period. We are additionally grateful for the chance to contribute to the substantial efforts made by the health care providers in delivering these programs for the benefit of the Medicaid population. We look forward to on-going collaborations and partnerships aimed at advancing evidence-based programs and policies in the State of Hawaiʻi.

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VIII. Appendices

Appendix I. Approved Evaluation Proposal Summary Tables

Demonstration Objective 1. Improve health outcomes for Medicaid beneficiaries covered under the Demonstration

Project 1A: Assessing Utilization, Spending, and Quality of Primary Care and its Association with Health Outcomes	
Component	**Description**
Corresponding Demonstration Hypothesis	Increasing utilization for primary care, preventive services, and health promotion will reduce prevalence of risk factors for chronic illnesses and lower the total cost of care for targeted beneficiaries.
Target populations	● Populations with one or more chronic conditions such as diabetes, hypertension, and chronic kidney disease ● Pregnant women ● Infants and children eligible for well child visits ● All adults
Evaluation questions and testable hypotheses	Evaluation Hypothesis H1.1: (1) Hypothesis 1.1.1: What are time trends in utilization, spending (as a percentage of total spending), and quality of primary care for Demonstration populations? a. Hypothesis: The Initiative will increase utilization, spending (as a percentage of total spending), and quality of primary care for demonstration populations, as measured by progressively broad definitions of primary care. (2) Hypothesis 1.1.2: a. Are changes in primary care utilization associated with plausibly relevant health outcomes? b. Are changes in primary care spending associated with plausibly relevant health outcomes? and c. Are changes in primary care quality associated with plausibly relevant health outcomes? Selection of health outcomes will be based on literature review and stakeholder (i.e., provider and beneficiary) consultation to identify and select health measures which are plausibly

	relevant to improvements in primary care utilization, spending, and quality, respectively (see Methodology and Limitations sections above).
Data Strategy, sources and collection frequency	**Administrative data.** Potential administration data for analysis include encounter, claim, and beneficiary-level report data regarding primary care utilization, spending, and quality measures, as well as beneficiary sociodemographic characteristics. The administration data are housed in the data warehouse of the State of Hawaiʻi Department of Human Services (DHS). Indicators that would be considered include HEDIS, state-defined health care quality and outcome measures, measures of total costs of care per beneficiary, as well as the measures of patient satisfaction and patient-reported outcomes e.g., Consumer Assessment of Healthcare Providers and Systems (CAHPS). Indicators chosen will depend on data availability and quality. Current indicators under consideration include HEDIS measures pertaining to Adult Access to Preventive/Ambulatory Health Services for distinct age groups, as well as other HEDIS measures and other quality measures as feasible. Examples of specific HEDIS measures that may be chosen for the evaluation include: ● Well-Child Visits in the First 15/30 Months of Life (W15/30-CH); ● Well-Child Visits in the Third, Fourth, Fifth and Sixth Years of Life (W34-CH); ● Prenatal and Postpartum Care (PPC-AD); ● Adolescent Well-Care Visits (AWC-CH); ● Adults' Access to Preventive/Ambulatory Health Services (AAP); and ● Children and Adolescents' Access to Primary Care Practitioners (CAP-CH). Examples of specific CAHPS measures that may be chosen for evaluation include: ● Getting Needed Care ● Getting Care Quickly

Statistical framework for measuring impacts	For all quantitative analyses, regression analysis using matching will be applied. Patient use of primary care is not random, and characteristics by plans, providers, and patients may systematically differ on observable characteristics. Propensity score matching will be used to assess whether use of primary care (as an endogenous treatment) is associated with changes in plausibly relevant health outcomes, based on a set of observable covariates. Time-series or longitudinal analysis will also be applied to examine time trends and discontinuities over time when data is available. (1) Hypothesis 1.1.1 a. Main Quantitative Analysis: Overall time trends in primary care utilization, spending, and quality will be examined, with a focus on geographic disparities and sociodemographic determinants and stratified by specific Medicaid demonstration populations (pregnant women, infants, children, etc.) b. Subgroup Quantitative Analysis: Medicaid beneficiaries who did not seek primary care prior to the current demonstration period will be identified. Changes in primary care measures of utilization, spending, and quality (using progressively broader primary care definitions) for these populations will be examined over time, with the expectation and hypothesis that primary care measures will increase over time. c. Qualitative analysis: In-depth interviews (n=25) will be conducted with plans, providers, and patients regarding patients who previously did not seek primary care to explore factors that led to changes in use of primary care and possible consequences or impacts of increased primary care utilization, spending, and quality. (2) Hypothesis 1.1.2: a. Hypothesis 1.1.2 is contingent upon seeing changes in Hypothesis 1.1.1. If there are no improvements in primary care observed, then this hypothesis is not relevant. b. Literature Review and Main Qualitative Analysis: This Hypothesis explores whether the changes in primary care as a result of this demonstration also lead to improvements in health outcomes. It cannot be assumed that increased primary care utilization, spending and quality necessarily leads to improvements in health outcomes (see Methodological Limitations). As such, for this study component, we propose to carefully choose a measure of health outcomes through literature review and stakeholder consultation in order to identify and select one health outcome that is plausibly associated with improvements in primary care utilization, spending, and quality. c. Quantitative analysis of the chosen health outcome will depend on the literature review and qualitative analysis. This basic form of this analysis would regress the chosen health outcome on a chosen measure of primary care utilization, spending, or quality, respectively, and holding other factors constant; and examined in the four years prior to the start of the program and each quarter thereafter.

Subgroup analyses to assess disparities and differences	Individual subgroup populations will be explored and may include consideration of factors or groupings, such as selection of one's health plan versus automatic assignment, selection of one's own Primary Care Physician (PCP) vs auto-assignment, participation in a Patient-Centered Medical Home (PCMH) vs not, or populations with discontinuous coverage vs those with full coverage.

Project 1B: Care Coordination for Beneficiaries with Complex Conditions	
Component	**Description**
Corresponding demonstration Hypothesis	Improving care coordination (e.g., by establishing team-based care and greater integration of behavioral and physical health) will improve health outcomes and lower the total cost of care for beneficiaries with complex conditions (i.e., high-needs, high-cost individuals).
Target populations	Medicaid beneficiaries identified as those having complex health needs
Evaluation questions and testable hypotheses	(1) Hypothesis 1.2.1: Care coordination for individuals identified as having complex health needs will result in improved health outcomes and (2) Hypothesis 1.2.2: Care coordination for individuals identified as having complex health needs will result in lowered utilization of the healthcare system, and a slower rate of expenditure growth
Data Strategy, sources and collection frequency	Administrative data will be used for analyses. Potential administration data for analysis include encounter, claim, and beneficiary-level report data regarding utilization, spending, and quality as well as beneficiary sociodemographic characteristics. The administration data are housed in the data warehouse of State of Hawaiʻi Department of Human Services (DHS).
Statistical framework for measuring impacts	For all quantitative analyses, regression analysis will be applied to assess whether individuals identified by MQD as having complex health needs experienced changes in plausibly relevant health outcomes and costs of care. MQD will provide information on the criteria for selection of individuals as having complex health needs. That criteria will be used to identify a plausible comparison group with similar or slightly lower levels of need and cost, which may lend itself to a regression discontinuity design. If a cutoff is not available (to enable regression discontinuity design), propensity score matching, using full optimal matching will be conducted. We will then pair the matching procedure with a time-series analysis to compare health outcomes, health utilization, can changes in expenditure growth in the four years prior to program evaluation and after the program was initiated on a quarterly basis for both the treatment and comparison groups.

Subgroup analyses to assess disparities and differences	Individual subgroup populations will be explored and may include consideration of factors or groupings, such as gender, age, and presence of multiple chronic conditions or behavioral health conditions.

Project 1C: Home- and Community-Based Services (HCBS)	
Component	**Description**
Corresponding demonstration Hypothesis	Improving care coordination (e.g., by establishing team-based care and greater integration of behavioral and physical health) will improve health outcomes and lower the total cost of care for beneficiaries with complex conditions (i.e., high-needs, high-cost individuals).
Target populations	● For hypothesis 1.3.1, the target population is Medicaid beneficiaries who use long-term services and support (LTSS) in the home- and community-based setting or institutional setting among individuals meeting NF LOC criteria. ● For hypothesis 1.3.2, the target population is individuals meeting NF LOC and receiving HCBS services. ● For hypothesis 1.3.3, the target population is beneficiaries who do not meet institutional level of care but are at-risk of deteriorating to an institutional level of care (i.e., the at-risk population).
Evaluation questions and testable hypotheses	Evaluation questions pertain to understanding whether: (1) Hypothesis 1.3.1: HCBS slow the deterioration of health as reflected in the level of care (measured by the timing of deterioration to a certain LOC level where entry into nursing home care becomes essential) among individuals meeting NF LOC criteria. (2) Hypothesis 1.3.2: Length of time to enter a nursing home, patient-reported health outcomes (PROs), and total cost of care vary depending on a variety of client characteristics among individuals meeting NF LOC criteria and receiving HCBS services. (3) Hypothesis 1.3.3: Length of time to enter a nursing home, PROs, and total cost of care vary depending on a variety of client characteristics among the at-risk population.
Data strategy, sources and collection frequency	**Administrative data.** Potential administration data for analysis include encounters, claims, and beneficiary-level report data such as LTSS utilization, Hawaii's health and functional assessment used to assess the health status of LTSS beneficiaries, and sociodemographic characteristics. The administration data are housed in the data warehouse of State of Hawaiʻi Department of Human Services (DHS). Functional assessment (LOC assessment) data are managed by an External Quality Review Organization — Health Services Advisory Group (HSAG). The LOC assessments are collected annually and when changes occur or when requested by beneficiaries in between two annual assessments.

	Primary data collection. Primary data may include the collection of patient-reported health outcomes annually and when changes occur.
Measures	The outcome measures include ● Length of time for the LOC to deteriorate to a certain level ● Length of time for beneficiaries to enter a nursing home ● Patient-reported health outcomes (e.g., beneficiaries' perception of health, quality of life, or satisfaction) ● TCOC We will consult the HCBS staff at the State of Hawai'i Med-QUEST Division to determine a certain LOC level as the threshold, and measure the length of time from the baseline (prior to any LTSS use) to the time point when a LTSS qualifying beneficiary's LOC reaches the threshold. Potential questions for patient-reported health outcomes may be adapted from nationally recognized sources such as PROMIS, GLOBAL10, and the HCBS survey from Consumer Assessment of Health Care Providers and Systems (CAHPS). Other measures pertaining to LTSS and variables for matching or controlling in the analysis may include, but are not limited to: ● Utilization of LTSS (e.g., whether one uses HCBS/nursing home, types of HCBS used, intensity and duration of HCBS/nursing home used, health plan). ● Factors that affect personal needs for care (e.g., health conditions and functional limitations). ● Factors that may predispose, enable, or impede those who use services (e.g., age and sex).

Statistical framework for measuring impacts	**Quantitative impact analysis.** For hypothesis 1.3.1, the evaluation will be based on a pre-post comparison of one period before the treatment (receiving HCBS or institutional care) and one or multiple periods after the treatment. Archived administrative data allow us to identify time points when Medicaid beneficiaries first started receiving LTSS and when they develop severe limitations in their functional status (as measured by the LOC and to be defined). The duration between the two time points is one measure of health outcome (i.e., length of time to duration). We plan to use a combination of matching methods and survival analysis. Matching methods are likely to create two balanced groups before beneficiaries receive the treatment. Matching variables may include, but not limited to, age, sex, health conditions, and the availability of caregivers. Hypotheses 1.3.2 and 1.3.3 will focus on identifying within-group comparisons. Specifically, we plan to examine subgroup differences in the patient-reported health outcomes, the deterioration to the institutional care, and the TCOC among individuals meeting NF LOC and receiving HCBS services and among the at-risk population using methods such as latent class growth analysis and survival analysis.
Subgroup analyses to assess disparities and differences	As described above, subgroup analyses are a major component of the HCBS evaluation. Specifically, we plan to examine subgroup differences in the patient-reported health outcomes, the deterioration to the institutional care, and the TCOC among HCBS users and the at-risk population using methods such as latent class growth analysis and survival analysis. Latent class growth analysis allows the evaluators to identify a specific number of unique classes, with each class containing a proportion of the overall sample who exhibit very similar trends over time. The class identification helps determine unique characteristics that are associated with program participants who are members of each class, some of which may have better, worse, or no change in the health outcomes and total cost of care. This analysis would inform further investigations about the reasons for the (lack of) change among subgroups in the future.

Demonstration Objective 2. Maintain a managed care delivery system that leads to more appropriate utilization of the health care system and a slower rate of expenditure growth

Project 2A: Value-based purchasing (VBP) reimbursed at the Health Plan and Provider levels	
Component	**Description**
Corresponding Demonstration Hypothesis	Implementing alternative payment methodologies (APM) at the provider level and value-based purchasing (VBP) reimbursement methodologies at the Health Plan level will increase appropriate utilization of the health care system, which in turn will reduce preventable healthcare costs.
Target populations	Medicaid beneficiaries

Evaluation questions and testable hypotheses	Evaluation questions pertain to understanding whether implementing VBP reimbursements at the Health Plan and provider level will: (1) Hypothesis 2.1.1: result in improved health outcomes; (2) Hypothesis 2.1.2: result in lowered utilization of the healthcare system; and (3) Hypothesis 2.1.3. result in a slower rate of expenditure growth The analyses will consider one or more VBP measures at the Health Plan level only, measures at the provider level only, and measures at both the Health Plan and provider levels.
Data strategy, sources and collection frequency	**Administrative data.** Potential administration data for analysis include encounters, claims, Health Plan-level quality data, and beneficiary-level report data (including beneficiary-level quality information). Health plan level VBP, and health plan data on provider-level VBP adoption and results, beneficiary-provider attribution data, and encounter data will be used in concert to identify beneficiaries served/services provided under different VBP structures.
Measures	The outcome measures may include one or more of the following: selected health outcome(s), total cost of care per beneficiary, and rate of expenditure growth in the managed care delivery system.
Statistical framework for measuring impacts	**Quantitative impact analysis.** To answer the first and second research questions, the evaluation will be based on data provided by MQD on beneficiaries' utilization of the health care system at the Health Plan and provider levels, and select Health Plan-level and beneficiary-level quality measure data as available (e.g., as reported to CMS in the Core Set of Health Care Quality Measures). The third question will be answered with administrative data (claims data), electronic records, and financial summaries submitted by health plans. We will use an interrupted time-series latent growth model to compare health outcomes, health utilization, can changes in expenditure growth in the four years prior to program evaluation and after the program was initiated on a quarterly basis.
Subgroup analysis to assess disparities and differences	As needed
Project 2B: Alternative Payment Models (APM) at the Provider level	
Component	**Description**
Corresponding demonstration Hypothesis	Implementing alternative payment methodologies (APM) at the provider level and value-based purchasing (VBP) reimbursement methodologies at the Health Plan level will increase appropriate utilization of the health care system, which in turn will reduce preventable healthcare costs.
Target populations	Medicaid beneficiaries

Evaluation questions and testable hypotheses	Evaluation questions pertain to understanding whether implementing one or more APMs at the provider-level will: (1) Hypothesis 2.2.1: result in improved health outcomes; (2) Hypothesis 2.2.2: result in lowered utilization of the healthcare system; and (3) Hypothesis 2.2.3. result in a slower rate of expenditure growth
Data strategy, sources and collection frequency	**Administrative data.** Potential administration data for analysis include encounters, claims, and beneficiary-level report data. Health plan tracking of providers' adoption of APM models, beneficiary-provider attribution data, and encounter data will be used in concert to identify beneficiaries served/services provided under different APM structures.
Measures	The outcome measures may include one or more of the following: selected health outcome(s), total cost of care per beneficiary, and rate of expenditure growth in the managed care delivery system.
Statistical framework for measuring impacts	**Quantitative impact analysis.** To answer the first and second research questions, the evaluation will be based on data provided by MQD on beneficiaries' utilization of the health care system, and select beneficiary-level quality measure data as available (e.g., as reported to CMS in the Core Set of Health Care Quality Measures) among one or more provider groups who have implemented an APM. The third question will be answered with administrative data (claims data), electronic records, and financial summaries submitted by health plans. We will use an interrupted time-series latent growth model to compare health outcomes, health utilization, can changes in expenditure growth in the four years prior to program evaluation and after the program was initiated on a quarterly basis.
Subgroup analyses to assess disparities and differences	As needed

Demonstration Objective 3. Support strategies and interventions targeting the social determinants of health

Project 3A: Community Integration Services (CIS)	
Component	**Description**
Corresponding demonstration Hypothesis	Providing community integration services and similar initiatives for vulnerable and at-risk adults and families will result in better health outcomes and lower hospital utilization.
Target populations	Medicaid beneficiaries who are eligible for and consent to participate in CIS.

Evaluation questions and testable hypotheses	Evaluation questions pertain to answering: Do program participants who are stably housed experience decreased utilization of acute services (emergency and inpatient utilization), greater engagement in outpatient care services, and decreased total cost of care? (1) Hypothesis 3.1.1: Participants who are stably housed will decrease utilization of acute services. (2) Hypothesis 3.1.2: Participants who are stably housed will increase utilization of outpatient care services. (3) Hypothesis 3.1.3: Total cost of care will be lower for participants after being stably housed. How does quality of life change as program participants progress through the CIS program? (4) Hypothesis 3.1.4: Individual health and wellbeing will improve as participants' progress through the program. How does program effectiveness vary by client needs and experiences? (5) Hypothesis 3.1.5: The effectiveness of the CIS program will vary depending on a variety of client characteristics.

Data strategy, sources and collection frequency	Archival administrative data will be used to identify trends in program participants' health care utilization at least one year prior to starting the program (compiled quarterly) and made available to the evaluation team. We aim to have service staff administer a validated electronic survey quarterly with their clients and have results made available to the evaluation team. **Administrative data.** Potential administration data for analysis include encounters, claims, and beneficiary-level report data such as CIS utilization, functional assessment, and sociodemographic characteristics. The administration data are housed in the data warehouse of State of Hawaiʻi Department of Human Services (DHS). **Primary data collection.** Housing and Case Management Assessment Tool (obtained face to face with client) Potential secondary data sources: ● Homeless Management Information System (HMIS) ● Contact hours and fidelity checklist The HMIS tracks client-level service utilization data across all homeless services providers. This system can be used to acquire social service use data not captured in health utilization records. Specifically, shelter stays, case management (not managed by a Medicaid provider) substance use treatment, and housing support. These records will help account for whether program participants are receiving concurrent services through other agencies. Service delivery hours will be a measure of dosage. These are the billable units filed by the case managers. This information, in conjunction with a fidelity checklist submitted by the case managers on a quarterly basis will be used to determine the extent that the program is being implemented as intended. **Note:** *DHS/MQD has not finalized the content of the eligibility screener, data collection forms used by health plans to support initial/ongoing assessment of CIS beneficiaries, and reporting requirements for the health plans. Evaluation methods will be adapted to the finalized tools as needed. The proposal submitted here assumes the use of certain tools for data collection. The evaluation team has offered its recommendations to MQD on the need for these instruments.*

Measures	Initial client needs and progress will be assessed using a validated survey tool. This tool was purposely designed to directly inform service providers of clients' needs and conditions while also providing a rich, empirically valid source of data for ongoing analysis. This tool will be administered quarterly to clients by the contracted providers. This tool will be used to track changes in self-reported access to healthcare, health outcomes, substance use, employment, income, service use/needs, and overall quality of life. The included measures were selected because they have shown adequate sensitivity to detect dynamic changes in wellness in a short time period and appropriate for the target population. Potential measures are outlined below: Access to Healthcare. A potential measure will include four items from the Behavioral Risk Factor Surveillance System (BRFSS; Centers for Disease Control and Prevention, 2013) that represent access to healthcare (e.g., "Do you have one person you think of as your personal doctor or health care provider?" and "Was there a time in the past month when you needed to see a doctor but could not because of cost?"). Two additional items ("How long do you have to travel to get to your health care provider?" and "If I need to see a specialist, it is easy for me to find one.") will be included to assess other domains of individual differences in participants' access to health care and to more fully capture the construct. Health-related Quality of Life Outcomes. Subjective perceptions of mental and physical health and stress will be measured. Overall perceived physical and mental health may be measured by the 9-item CDC Health-Related Quality-of-Life measure (HRQOL; the 4-item Core Module and 5-item Symptoms Module). The HRQOL is an empirically validated scale (Barile et al., 2013; Horner-Johnson et al., 2010) that consists of a 4-item physical health scale and a 4-item mental health scale that measures both anxiety and depression. Previous research using items from the HRQOL measure have demonstrated content, construct, and criterion validity with the Short-Form 36 (CDC 2000; Moriarty et al 2003; Moriarty et al 2005). Perceived stress will be measured by the Perceived Stress Scale-4 (Cohen, Kamarck, & Mermelstein, 1983; Cohen & Williamson, 1988). The Perceived Stress Scale also has been found to valid and reliable. This scale includes items such as, "In the last month, how often have you felt that you were unable to control the important things in your life?" Previous literature has found the measure to have a two-month test-retest reliability of .55 (Cohen, Kamarck, & Mermelstein, 1983) and to have construct and discriminant validity (Cohen & Williamson, 1988; Cohen, Tyrrell, & Smith, 1993). Substance Use. Substance Use may be monitored by including items from the Patient-Reported Outcomes Information System (PROMIS) Alcohol Use – Short Form. This measure assesses individuals' drinking behavior regarding the amount and impact by asking whether individuals drank heavily, had trouble controlling their drinking, or had difficulty getting the thought of drinking out of their head. This measure will be modified to assess any substance that a program participant has had a history of using. The measures chosen here are based on previous stakeholder feedback. However, the evaluation team may select additional or alternative measures based on literature review and stakeholder consultation to ensure that measures that are plausibly relevant to improvements in beneficiary health outcomes and total cost of care are considered comprehensively.

Statistical framework for measuring impacts	**Quantitative impact analysis.** Our primary evaluation questions will be assessed using multi-level sequential process growth mixture modeling (SPGMM), with adjustment for the nesting of participants within CIS case manager. We will answer secondary questions using latent class analyses and/or multinomial logistic regression. Latent growth modeling, more generally, is a method of estimating change over time that allows the researcher to test associations among time invariant (conditions that do not change) and time varying covariates (conditions that likely do change) and growth. Traditional latent growth curve modeling assumes that individuals within the sample likely change at similar rates over time. This level of homogeneity is unlikely, particularly with community-based samples. “Mixture” models allow the researcher to estimate heterogeneity in growth and identify naturally occurring “classes” or subsamples who follow similar trends. Multilevel modeling will be employed to account for the nesting of participants within case managers, as the outcomes for each participant are likely dependent upon how each case manager implements the program. To conduct a growth mixture model, the data analyst will systematically compare the fit and appropriateness of a series of models to the data with one or more “classes” – most commonly between 2 and 8. This approach aims to identify a specific number of unique classes, with each class containing a proportion of the overall sample who exhibit very similar trends over time. For our evaluation, we will employ sequential process growth mixture modeling because it will allow to identify unique classes before and after the start of the intervention, with class membership prior to start of the intervention likely predicting class membership after the start of the intervention. This process will allow us to determine what unique characteristics are associated with program participants who are members of each class, some of which may have excelled in the program while other deteriorated (or exhibited other unique trends over time). The first step in the analyses will be to identify growth trajectories based on longitudinal medical utilization records. The potential for two or more unique subgroups or classes that emerge from this data will then be examined, this is represented by Latent Class 1 in Figure 2. The second stage of the analyses identifies growth trajectories based on longitudinal data since starting the program (Latent Class 2). This will include medical utilization trends since starting the program (compiled quarterly) and predicted by covariates and moderators listed in Figure 2. Finally, associations between being a member of a specific class since starting the program and the patient reported outcomes, specifically the quality of life indices will be observed. This analytical approach will be used to assess the impact of the program on health care expenditures before and after the start of the program. **Hypothesis 3.1.1 and 3.1.2:** Slopes (changes over time) identified prior to the start of the program using health care utilization records will be used to identify statistically significant changes in slopes identified after the start of the program. These analyses can be conducted after participating in the program one year, with four quarterly aggregated expenditures observed before and after the start of the program. **Hypothesis 3.1.3 and 3.1.4:** Survey data assessing patient reported outcomes will be integrated into the health care expenditures model, with health care expenditure slopes being used to account for baseline needs when examining program outcomes, such as quality of life. Intermediate findings included in the rapid-cycle assessments will focus on the program’s implementation, fidelity, and adaptions. Dosage data, defined as the amount of face-to-face

	time that case managers spent with their client, and transitions from pre-tenancy to tenancy will be used to predict short-term outcomes. Depending on the number of case managers, multilevel modeling will be employed to account for the nesting of individuals with service providers (participants are nested within a case manager, and case manager are nested within their health care organization). Have multiple case managers will also allow us to examine the impact program implementation at the provider level. These intermediate, process-focused indicators will help inform providers of how implementation might be adapted to obtain the best results for their clients. The impact of dosage and other measures of fidelity will be used to predict classes or clusters of program participants demonstrated a range of success in the program as measured by the quality-of-life indicators and health expenditures in the previous six-months. These assessments will help identify necessary program adaptions and provide periodic updates on the health and well-being of participants. **Hypothesis 3.1.5:** will be addressed by examining the unique classes and trajectories of program participants. It is very likely that the program with not be equally successfully for all participants. Because of this, examining the subgroups defined by the classes will inform who might be the best candidate for the program. Potential predictors may include individuals' history of substance use, mental illness, trauma, or years experiencing homelessness.

Project 3B: Assessing process of planning and implementing support strategies addressing social determinants of health	
Component	**Description**
Corresponding demonstration Hypothesis	Providing community integration services and similar initiatives for vulnerable and at-risk adults and families will result in better health outcomes and lower hospital utilization.
Target populations	Medicaid demonstration populations

Evaluation questions and testable hypotheses	This evaluation takes a realist evaluation approach to understanding how MQD has influenced the ecosystem of strategies and interventions that address the SDOH to ask the following contextual questions: (1) What kinds of support strategies and interventions addressing the social determinants are chosen by health plans and how do these strategies translate to provider and patient behaviors? (2) In what ways did Health Plans develop and adopt a SDOH Work Plan within its Quality Assessment and Performance Improvement (QAPI) plan? (3) In what ways did the State develop the SDOH statewide Transformation Plan? We crudely essentialize these questions into the following binary hypotheses: (1) Hypothesis 3.2.1: Different support strategies and interventions addressing the social determinants chosen by health plans will alter provider and patient behaviors. (2) Hypothesis 3.2.2: Health Plans will develop and adopt a SDOH Work Plan within its Quality Assessment and Performance Improvement (QAPI) plan. (3) Hypothesis 3.2.3: The State will develop and implement the SDOH statewide Transformation Plan.
Data Strategy, sources and collection frequency	**Qualitative interviews** In-depth interviews with purposively chosen stakeholders from Health Plans, Regional Health Partnerships (if any), providers in regards to their SDOH strategies and interventions (n=25) with subsequent thematic analysis using grounded theory, and review of MQD-provided documentation including meeting minutes, SDOH methodology, and capitation methodology.
Statistical framework for measuring impacts	Not applicable
Subgroup analyses to assess disparities and differences	Not applicable

Appendix II. Data Sources

The evaluation included the following data sources:

- Hawaiʻi Prepaid Medical Management Information System (HPMMIS) Administrative Claims and Encounter Data (encounter data): Health Plans in Hawaiʻi are contractually required to submit complete, accurate, and timely encounter data to HPMMIS. Encounter and claims data were used by the evaluation team to access information on diagnoses, utilization of services, and cost of care over time for a variety of analyses requiring these parameters. MQD receives encounter data up to twice per month from Health Plans, and the data is subject to a comprehensive encounter data validation process. Encounters that do not meet validation criteria are either rejected or pended in the system. Health Plans are required to review their pended encounters, make corrections and submit replacements as needed. Hawaii's encounter data does not currently meet actuarially acceptable completeness and accuracy standards; a variance of up to 10–15% on average is detected during encounter data reconciliation. Additionally, encounter data does not capture services provided to beneficiaries that are not submitted via claims; this may include some non-emergency medical transportation; other value-added services; care and service coordination and housing supports provided by Health Plan administrative staff; self-directed chore services; quality bonuses and other supplemental payments; and sub-capitation payments made to providers (although the corresponding encounters may be submitted). The Hawaiʻi Medicaid program is actively engaged in a multi-pronged strategy to address these data quality issues. As data quality is enhanced, the completeness and accuracy of data will improve; while this improvement is beneficial for evaluation, various analytic considerations were accounted for differences that arise from increases in cost and utilization attributed to improved data quality, as opposed to the interventions.
- HPMMIS Health Plan Enrollment Data: HPMMIS is the Hawaiʻi Medicaid Program's enrollment system. As such, beneficiaries eligible for Medicaid are enrolled in a Health Plan and the managed care plan begins to receive capitation payments as of the date of enrollment. Data sent to Health Plans from HPMMIS, which includes member demographics extracted from the member's application (age, sex, race, geography, ethnicity, etc.), eligibility category (Aged, Blind, Disabled; Low Income Adult, etc.), enrollment in special programs (LTSS, "at risk", CIS, etc.) and capitation payment amounts, were extracted and provided for analysis. Most data pertaining to Health Plan enrollment and capitation payment is heavily reviewed and checked for quality.

- Actuarial Risk Score data: The evaluation team used the Chronic Illness and Disability Payment System (CDPS) This is "diagnostic-based risk adjustment model that is widely used to adjust capitated payments for health plans that enroll Medicaid beneficiaries." (hwsph.ucsd.edu). The evaluation team used individual risk scores for the evaluation purposes. An individual risk score is calculated on age and gender, and diagnoses categories, with multiple diagnoses for different categories leading to higher risk scores. Risk scores are developed for rate setting purposes and are considered predictors of costs. Scores provide insight into multimorbidity and are a predictor for care utilization. The scores are therefore used by the evaluation team to control for health status across population groups under study.

- Health Plan Reports (as dictated by Health Plan contract requirements): Clinical information to support the evaluation, such as a beneficiary's housing situation and functional limitations, were gleaned through Health Plan reporting requirements, independent of administrative claims or encounter data. MQD implemented new reporting requirements at the start of the demonstration period for Health Plans to provide information that would otherwise not be available through other standardized data sources. The evaluation team used reports developed by MQD for VHC, Primary Care, CIS, SCHN/EHCN, LTSS and QAPI. To construct the different reports, Health Plans retrieved information from EHRs, case management systems, etc., and standardized this information into MQD's standardized reporting format. Reports were under development for the duration of the demonstration; therefore, limitations were imposed on the evaluation team in the use and interpretation of the data reported.

- Healthcare Effectiveness Data and Information Set (HEDIS®) and Other Quality Measure data: MQD has historically collected data on HEDIS quality measures, and other performance measures, from Health Plans in an aggregate format. Beginning in 2021, MQD implemented a patient-level data file requirement that allows for more granular data collection. This file includes identifiers that allow for linking quality-based outcomes with other member-level information including demographics, utilization, cost of care, and other metrics. MQD began with a subset of measures for patient-level reporting to phase implementation, therefore reducing the total amount of data available for evaluation. Also, no historic patient-level data was available for comparison or analysis.
- External data sources holding information collected by MQD-contracted providers (e.g., HILOC database, HMIS data system)
    - HILOC Database: This database is maintained by the Health Services Advisory Group (HSAG), MQD's EQRO, and collects data on the level of care (LOC) assessments requested by Health Plans and community providers for Medicaid members who require nursing facility level of care (NF LOC) or who are "at risk" of deteriorating to the NF LOC. The dataset includes comprehensive assessments of individuals' functional status during the initial request, annual review, or as changes occur. It also includes information about demographic characteristics and the availability of caregivers, which allows the evaluators to conduct matching and subgroup analyses. The data are collected primarily through a secure Web application developed by HSAG. Through this application, submission and review/approval of LOC requests are accessible to registered users from the State, Medicaid Health Plans, and service providers. Compared to paper-based methods, this automated data collection and processing method is more efficient and can provide faster reporting with more accuracy. HILOC interfaces with the State's prepaid medical management information system and can provide the necessary information to produce monthly, quarterly, annual, and ad hoc reports. Data timeliness and completeness may be impacted by the COVID-19 pandemic; through additional public health emergency related waiver authorities, individuals receiving LTSS services may begin or continue to receive services without an assessment during the public health emergency period.
    - HMIS. The Homeless Management Information System (HMIS) is a local information technology system that is used to collect and report client-level data for individuals who have experienced homelessness or at risk of homelessness and receiving support services. In Hawaiʻi, Health Plans work closely with the Continuums of Care responsible for managing the database. The evaluation team leveraged this data to account for ancillary services that complement services delivered via the CIS project. The database is limited by the quality and timelessness of the data entered by service organizations who provide direct care to clients experiencing homelessness. It is also relatively rigid regarding the types of data that can be entered. Moreover, it is not designed to be a research tool, but as a mechanism for accessing individual client records and histories. Despite these limitations, the quality and timeliness of data entry is monitored by the Continuums of Care (there are two CoCs for the

state of Hawaiʻi) to ensure that data files are appropriate for program evaluation and monitoring purposes.

- Surveys and in-depth interviews developed by the evaluators explicitly for our purposes, such as in-depth interviews with Health Plans conducted by the evaluators or qualified contractors.