The Pennsylvania Rural Health Model (PARHM)

Third Annual Evaluation Report Appendix

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September 2023

The contents of this report are solely the responsibility of the authors and do not necessarily represent the official views of the U.S. Department of Health and Human Services or any of its agencies. Research reported in this report was supported by the Center for Medicare & Medicaid Innovation under HHSM-500-2014-00035I.

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Appendix A. Analytic Methods

This evaluation has multiple levels, reflecting Pennsylvania Rural Health Model's (PARHM) complexity and research questions to be addressed. We used an "embedded," "multiphase" mixed-methods design, involving both qualitative and quantitative data sources to characterize the structure of the participating hospitals; the contexts in which they operate; their activities; implementation experience and the support provided by the Centers for Medicare & Medicaid Services (CMS) Innovation Center and the Commonwealth through the Rural Health Redesign Center (RHRC); and associated outcomes. The qualitative approach to capture these model components, implementation, and outcomes includes document review; annual site visits and interviews with participating hospitals; and telephone interviews with other partners (that is payers, community partners, Commonwealth and RHRC staff, technical experts, or non-participating hospitals). We will descriptively assess participation in the model and the association between participation and outcomes, such as population health, spending and utilization, quality of care, and financial performance.

Qualitative Methods

We gathered primary data to understand the experiences and perspectives of PARHM's multiple stakeholders and provide insight into a variety of model-related topics.

Data Sources

This report draws on two qualitative data sources: 1) model documents and 2) virtual site visits and interviews (45-90-minute interviews using videoconference software).

Model Documents. The research team conducted a systematic review of the model documentation (for example, model agreement, model budgets, contracts, and hospital transformation plans). These documents informed key informant outreach and interview guide development.

Virtual Site Visits and Interviews. The purpose of the virtual site visits was to obtain firsthand information about the implementation of the model, motivations to participate, model-associated outcomes, challenges, and suggestions for improvement. The research team used a purposive sampling approach to select model implementation partners and the team members with a set of distinct roles (for example, leadership, clinical leaders, clinicians) associated with each participating hospital. Document review also informed the relevant hospital team member roles at each site. The final list of key informants included individuals from the following categories (number of individuals):

- Commonwealth leadership and implementation partners involved with the model (that is the Department of Health, state offices, agencies, technical experts) (6)
- Cohort 1 participating hospital leadership and staff (4)

- Cohort 2 participating hospital leadership and staff (17)
- Cohort 3 participating hospital leadership and staff (7)
- Participating and non-participating health system leadership (5)
- Community partners (4)
- Participating commercial payers (9)
- Patients (8)

The team developed semi-structured interview guides for the virtual site visits based on each category of key informants and tailored these interview guides in advance of each interview or virtual site visit. **Exhibit A.1** includes informant types and associated topics.

A two- or three-person team conducted 56 video interviews from July through September 2022.[a] A senior member of the team facilitated each interview using a semi-structured interview guide, and a research analyst took detailed notes during each interview. Each interview was recorded with the participants' consent and professionally transcribed following the interviews.

Appendix Exhibit A.1. Interview Topics by Informant Type

Informant Type	Interview Topics
Commonwealth leadership	■ Perspectives on model design and development ■ Barriers and facilitators to model implementation, including participant recruitment, global budgets, hospital transformation plans ■ Engagement with hospital and payer participants ■ Use of program data to monitor program ■ Perspective on model effectiveness ■ Lessons learned and sustainability of program
Implementation partners	■ Approaches to technical assistance ■ Perspectives on the model effectiveness and hospital readiness ■ Barriers and facilitators to model implementation and technical assistance ■ Lessons learned and potential areas of improvement
Hospital and health system leadership	■ Motivation for participating in the model ■ Process for decision-making and stakeholder engagement ■ Experiences with global budget planning implementation ■ Experiences with hospital transformation plan implementation ■ Perspectives on technical support and assistance ■ Model impact on hospital staffing and hospital leadership ■ Suggestions for the Center for Medicare & Medicaid Innovation and advice to other rural hospitals

[a] While we conducted interviews with 60 individuals, some video interviews were group interviews.

Informant Type	Interview Topics
Hospital staff	■ Experiences with planning and implementing hospital transformation activities and initiatives ■ Engagement with community partners and technical assistance providers ■ Changes and outcomes since the implementation of transformation activities ■ Barriers and facilitators to model implementation
Community partners	■ Relationship to the hospital and awareness of the hospital's involvement in the model ■ Designated roles and activities in the implementation of the model ■ Experiences with collaborating with other community organizations and technical assistance providers ■ Barriers and facilitators to collaboration efforts ■ Perspectives on model impact on community
Commercial payers	■ Background and involvement with the model ■ Motivation for participating in the model and discussion on the approval process ■ Perspectives on model implementation and hospital readiness ■ Perspectives on global budget and sustainability ■ Model impact on financial stabilization and quality of care
Patients	■ Knowledge of transformation activities and motivation to participate ■ Perspectives on new workflows and programs implemented as part of the model ■ Model impact on access to care, quality of care, and health and quality of life

Qualitative Analysis

Document Review Process for PY 3 (2021) Hospital Transformation Plans. The hospital transformation plans included eight high-level transformation categories: substance use, behavioral health, access, operational efficiency, care management, emergency department (ED) utilization, geriatric care, and "other." Due to the high degree of overlap among the goals and proposed action steps within these categories, we collapsed and combined several goals:

- collapsed and recoded geriatric care goals under care management given the goal alignment between the two categories;
- combined and reported care management and ED utilization goals together due to the thematic parallels between the two categories;
- combined behavioral health and substance use goals; and
- assigned a relevant category to goals listed as "other".

Using the hospital transformation plans, we inductively developed a codebook using a domain/process framework. The domain codes were used to categorize the goals and action steps by the specific subject matter areas hospitals focused on (for example, *primary care* or *diabetes*). The process codes delineated the proposed action steps hospitals would take to reach their transformation goals (for example, *engage community partners*, *develop and/or implement protocols or workflows*). More than one domain code and more than one process code could be applied to each goal and action step. Each hospital transformation plan was coded by a different coder three separate times with each round of coding reconciling previous rounds to improve inter-coder

reliability. The coding process identified a high degree of goal overlap, redundancies, similarities, and patterns across different hospital transformation plans and within individual plans.

Codebook Development for Semi-Structured Interviews. Using the interview guides and research questions, the team developed an initial set of codes and then updated the codebook with emerging themes throughout the analysis. The analysis employed both inductive and deductive methods to examine implementation partner, hospital, and payer participant perspectives on the implementation, financial, organizational, and programmatic features of the model. As part of the initial data collection efforts each year, the team reviewed and refined the codebook to account for the complexity of the model and associated changes relevant to participants' implementation experience.

Data Analysis. The team reviewed all of the transcribed interviews for accuracy and quality. Once each transcript was reviewed, an analyst uploaded the transcript to the Dedoose software® to facilitate coding and analysis. The team conducted thematic analysis of the data, identifying relevant themes and areas of convergence or divergence across the participants and implementation partners. Multiple team members coded the first set of interviews and met to discuss areas where the code application was unclear or inconsistent. This process served to improve the team's inter-coder reliability and identify any necessary revisions to the codebook. The analysis involved a review of findings within and across codes to understand themes across different hospital types and from the perspective of participants and implementation partners.

Quantitative Methods

This appendix includes additional information regarding the quantitative methods and analyses found in Chapters 2 (Model Participation) and 3 (Descriptive Assessment of Financial Performance and Interim Medicare Spending).

Market Area Definition

Our evaluation uses a market area definition based on each participating hospital's rural geographic area (RGA), which was defined as part of the Commonwealth's agreement with the Innovation Center. Each hospital's RGA is defined as the ZIP codes from which a participating hospital draws the majority of its patients.1 The model uses the RGA to inform key activities, including calculating total cost of care (TCOC) guardrails, monitoring participating hospitals' TCOC, monitoring leakage or unintended volume shifts and migration trends, monitoring trends in Medicare fee-for-service (FFS) enrollment and service area characteristics, and reporting population health quality metrics.[2]

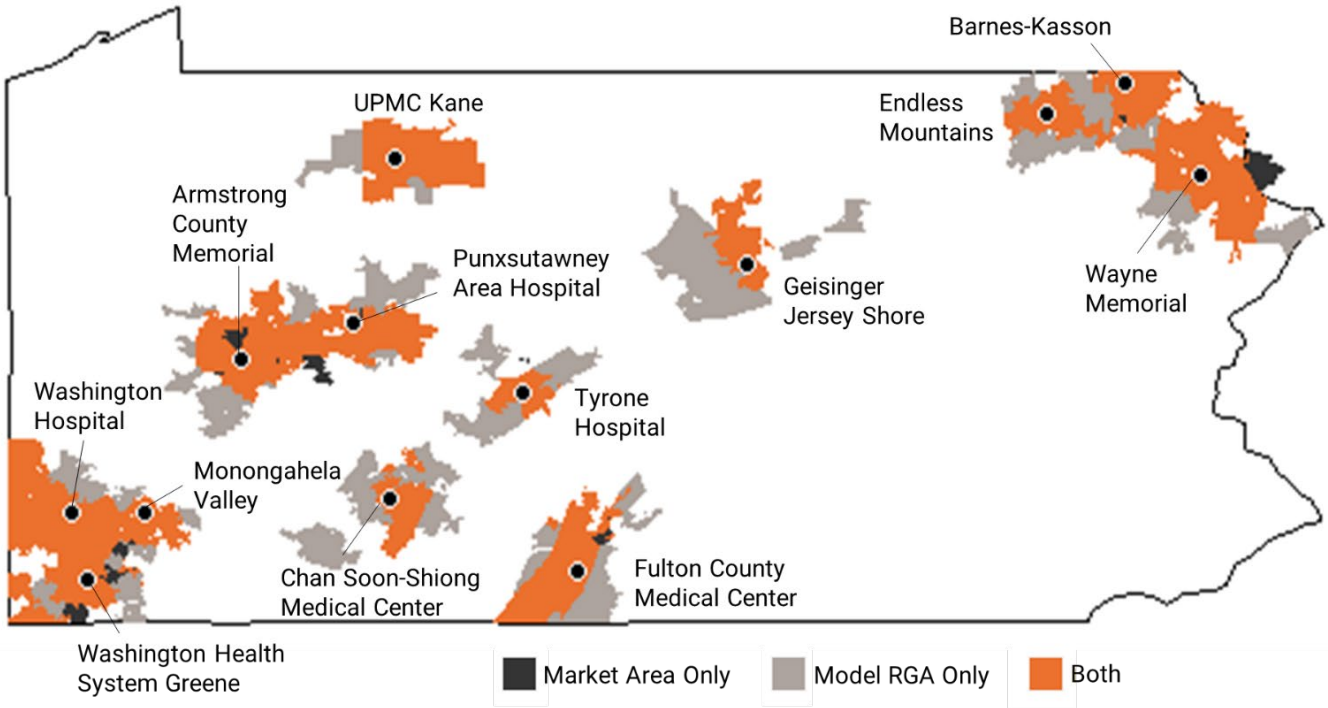
We use Medicare data to select ZIP codes for inclusion in the market area, calculated separately for each participating hospital. We define the market area using the following steps:

1) Using the Medicare Beneficiary Summary File for the year prior to each hospital joining the model, select patients living in Pennsylvania ZIP codes.
2) For patients identified in step 1, pull all Medicare FFS claims that are included in the scope of the model's global budget.

3) Using the claims identified in step 2, calculate the total revenue for the hospital in each Pennsylvania ZIP codes and rank in descending order.
4) Retain ZIP codes from step 3 that comprise at least 0.75% of a hospital's total revenue.
5) Using the claims identified in step 2, rank providers by total revenue in each Pennsylvania ZIP code.
6) Add any ZIP code wherein the hospital is one of the top two providers from step 5, if they are not already included in the list in step 4.

This market area definition includes areas where the hospital has the most market share and total revenue, which are the areas most likely to be affected by the model's transformation activities. This narrow definition allows the evaluation to assess model outcomes on areas directly targeted by model activities, rather than effects on a broader geographical area. The model's RGA follows the same steps 1 through 6 as listed above, but also includes all Pennsylvania ZIP codes that contribute to a cumulative 75% of revenue for each hospital, which is a broader definition than the market area definition we are using for the evaluation. **Appendix Exhibit A.2** displays the overlap between the ZIP codes included in the evaluation's market area definition and the model's RGA definition.

Appendix Exhibit A.2. Cohort 1 and Cohort 2 Market Area and Rural Geographic Areas



The choice of method for defining the hospital market area has a significant bearing on the analytic sample size. We utilized a modified version of the "blended logic" approach used by the Program Analysis Contractor to define the market areas because the market area definition struck a good balance between accounting for most of the participating hospitals' inpatient and outpatient overall revenue and the footprint of the hospitals, as measured by market share, in the selected market areas. **Appendix Exhibit A.3** presents the revenue and market

share thresholds as well as the analytic sample size for the two participation scenarios. We also considered an alternative market area definition based on a lower market rank threshold because none of the ZIP codes for one hospital in participation scenario #2 met the market rank criteria.

Appendix Exhibit A.3. Defining Hospital Market Areas

Participation Scenario	Number of Participating Hospitals	Revenue Floor	Market Rank Threshold	Average Hospital Revenue Share	Average Hospital Market Share	Number of ZIP Codes	Number of Patients in Selected ZIP Codes
#1	17	0.75%	Rank <= 2	84%	27%	162	**81,106**
	17	0.75%	Rank <= 3	84%	27%	194	**98,334**
#2	24	0.75%	Rank <= 2	83%	25%	210	**111,958**
	24	0.75%	Rank <= 3	85%	23%	252	**133,816**

NOTES: Revenue Floor Threshold – The overall contribution of the ZIP code to the hospital's inpatient and outpatient revenue should exceed this threshold in order for the ZIP code to be selected. Market Rank Threshold – The hospitals' inpatient and outpatient services market share ranking should be at or lower than the specified rank. Average Hospital Revenue Share – Average of the hospitals' revenue share attributable to the pool of selected ZIP code.; Average Hospital Market Share – Average of the hospitals' average market share of the selected ZIP codes.

While narrower than the RGAs defined within the model, the above methodology still captures fairly broad geographic areas where the impact of hospitals' transformation activities may be dilute and difficult to see in spending, utilization, and quality outcomes. As a sensitivity test, we also constructed a set of narrower market areas constructed out of the smallest set of ZIP codes necessary to comprise 50% of hospital revenue. That is, the ZIP codes were sorted based on the share of the hospital's revenue earned within those zip codes in descending order with those where the hospital is not among the top two providers in the zip code discarded. Zip codes are then selected in order until 50% of the hospital's revenue is covered.

Data Sources

Appendix Exhibit A.4. lists the data, years, and sources used for the quantitative analyses. We also include a description of how the data was used.

Appendix Exhibit A.4. Data Sources for Quantitative Analyses

Data	Years	Rationale	Source(s)
Medicare Parts A and B enrollment database and claims files	CY 2013-CY 2021	Assess Medicare fee-for-service interim payments, reimbursement, and service mix	Centers for Medicare & Medicaid Services (CMS) Chronic Conditions Warehouse Virtual Research Data Center
Medicare cost reports	FY 2013-FY 2020	Assess hospital profitability, liquidity, cost-based reimbursement, and capital, cost, and revenue structure	CMS
Pennsylvania Health Care Cost Containment Council (PHC4) files	FY 2013-FY 2021	Assess financial performance	PHC4 online database
Global budgets payments spreadsheets	CY 2019-CY 2021	Assess Global Budget payments	CMS
American Hospital Association (AHA) Annual Survey	2014-2018	Identify characteristics of hospital participants	AHA
AHRQ Compendium of U.S. Health Systems	2016, 2018	Identify characteristics of eligible non-participating, and participating health systems	Agency for Healthcare Research and Quality

Specifications for Descriptive Measures

Appendix Exhibit A.5. lists the hospital level financial performance measures, including specifications and sources for each measure. **Appendix Exhibit A.6.** lists the population level spending and utilization measures, including specifications and sources for each measure.

Appendix Exhibit A.5. Specifications for Financial Performance Descriptive Measures

Measure	Specification
Total Margins	Excess of revenues over expenses as a percentage of total revenue. Indicates the hospital's overall financial strength and ability to generate profits and resources required to invest in facilities, staff, and infrastructure. Formula: (Net Income / Total Revenue) Medicare Cost Report Data Elements: Worksheet G-3, Lines 3, 25, and 29
Salaries to Net Patient Revenue	Salary expenses as a percentage of net patient revenue. Indicates the staffing efficiency of the hospital. Formula: (Salary expense / Net Patient Revenue) Medicare Cost Report Data Elements: Worksheet A, Column 1, Row 200; Worksheet G-3, Line 3

Measure	Specification
Days Cash on Hand	Indicates the participating hospitals' cash flow relative to the size of their expenses. Formula: (Cash + Temporary Investments + Investments) / ((Total Expenses – Depreciation) / Days in Period)) Medicare Cost Report Data Elements: Worksheet A, Column 2, Lines 1-3; Worksheet A Column 3, Line 200; Worksheet G, Column 1-4, Lines 1-2, 31
Long-term Debt to Capitalization Ratio	Indicates the hospital's ability to sustain accumulated debt. Formula: (Long-Term Debt / (Long-Term Debt + Net Assets)) Medicare Cost Report Data Elements: Worksheet G, Column 1-4, Lines 40, 50, and 59

Appendix Exhibit A.6. Specifications for Spending and Utilization Descriptive Measures

Measure	Specification
Total Medicare Spending	The "Claim Payment Amount" field in the DME, HHA, Outpatient, Carrier, hospice, and SNF header files was used to determine the interim Medicare FFS payment. For the inpatient header file, the pass through payments ("Claim Pass Thru Per Diem Amt" field times the "Claim Utilization Day Count" field) were added to the "Claim Payment Amount" Field. Inflation adjustments were made using CPI.
Medicare Global Budget Spending	The "Claim Payment Amount" field in the Outpatient and SNF header files was used to determine the interim Medicare FFS payment. For the inpatient header file, the pass through payments ("Claim Pass Thru Per Diem Amt" field times the "Claim Utilization Day Count" field) were added to the "Claim Payment Amount" Field. Only SNF claims pertaining to swing bed stays at critical access hospitals were included. Only inpatient and outpatient claims originating from acute care hospitals were included. Inflation adjustments were made using CPI
Inpatient Admissions	Claims on the inpatient header file were grouped into distinct episodes based on their admission and discharge dates. If a claim recorded an admission date within 1 day of a prior discharge, this claim was grouped with the prior one if 1) the provider was a different hospital than the prior claim (indicating a transfer) or 2) the discharge status from the prior claim was 30 (still patient) and the new admission is to the same facility. Claims with overlapping date ranges were grouped regardless of provider listed. Admissions is the total number of resulting episodes. For the purposes of measuring bypass, only claims from acute care hospitals were considered. For all other measures, any inpatient stay, regardless of facility, was considered.
Length of Stay	For inpatient admissions described above, the length of stay was determined by counting the number of days between the earliest admission date and the latest discharge date on the set of claims comprising the episode.
ED Visits	Claims on the Outpatient header file were filtered to those with an associated line with at least one of the following revenue center codes ("0450", "0451", "0452", "0453", "0454", "0455", "0456", "0457", "0458", "0459", "0981"). Claims that had overlapping or identical dates for the same patient were then combined into a single episode. Episodes that were followed by an inpatient admission within 1 day were excluded. For Medicaid the Other Services File was used.

Measure	Specification
Observation Stays	Claims on the Outpatient header file were filtered to those with an associated line with a revenue center code “0762” and one of the following HCPCS codes ("G0378", "G0379"). Claims that had overlapping or identical dates for the same patient were then combined into a single episode. Episodes that were followed by an inpatient admission within 1 day were excluded.
Ambulance Utilization	Claims on the Outpatient header file were filtered to those with an associated line with a revenue center code in the list ("0540", "0541", "0542", "0543", "0544", "0545", "0546", "0547", "0548", "0549") and one of the following HCPCS codes ("A0425", "A0426", "A0427", "A0428", "A0429", "A0430", "A0431", "A0432", "A0433", "A0434", "A0435", "A0436"). Overlapping claims for the same patient and provider were grouped together. Only ambulances going to acute care hospitals, skilled nursing facilities, and FQHCs were considered. Air ambulance utilization was determined by taking the subset of the above with lines with HCPCS codes in the list ("A0430", "A0431", "A0435", "A0436"). For Medicaid, the Other Services File was used. No restrictions on ambulance destination were placed on the Medicaid analysis
Medicare FFS Initial Preventive Physical Examination (IPPE) and Annual Wellness Visit (AWV) Utilization	Claims on the outpatient file and carrier files were filtered to those with an associated line with at least one of the following HCPCS codes ("G0468", "G0402", "G0438", "G0439"). If multiple claims from a single patient in a single year were identified, only one was counted. Only claims on the outpatient file associated with FQHCs and RHCs were considered. These claims had a provider number with the 3rd and 4th digit in the list ("10", "11", "18" "19", "34", "38", "39", "85", "86", "87", "88", "89") and the 3rd-6th digit were not in the list ("1990", "1991", "1992", "1993", "1994", "1995", "1996", "1997", "1998", "1999")
Evaluation and Monitoring Utilization	Claims on the outpatient file and carrier files were filtered to those with an associated line with at least one of the following BETOS codes (“M1A”, “M1B”, “M2A”, “M2B”,”M2C”, “M3”, “M4A”, “M4B”, “M5A”, “M5B”, “M5C”, “M5D”, “M6”). If multiple claims from a single patient in a single year were identified, only one was counted. Only claims on the outpatient file associated with FQHCs and RHCs were considered. These claims had a provider number with the 3rd and 4th digit in the list ("10", "11", "18" "19", "34", "38", "39", "85", "86", "87", "88", "89") and the 3rd-6th digit were not in the list ("1990", "1991", "1992", "1993", "1994", "1995", "1996", "1997", "1998", "1999") For Medicaid, all claims on the Other Services file meeting the BETOS code restrictions were considered.
Imaging, Procedure, and Testing Services	Claims on the outpatient file and carrier files were filtered to those with an associated line with at least one of the following BETOS codes: 1) Imaging ("I1A", "I1B", "I1C", "I1D", "I1E", "I1F", "I2A", "I2B", "I2C", "I2D", "I3A", "I3B", "I3C", "I3D", "I3E", "I3F", "I4A", "I4B") 2) procedures ("P0", "P1A", "P1B", "P1C", "P1D", "P1E", "P1F", "P1G", "P2A", "P2B", "P2C", "P2D", "P2E", "P2F", "P3A", "P3B", "P3C", "P3D", "P4A", "P4B", "P4C", "P4D", "P4E", "P5A", "P5B", "P5C", "P5D", "P5E", "P6A", "P6B", "P6C", "P6D", "P7A", "P7B", "P8A", "P8B", "P8C", "P8D", "P8E", "P8F", "P8G", "P8H", "P8I", "P9A"); 3) tests ("T1A", "T1B", "T1C", "T1D", "T1E", "T1F", "T1G", "T1H", "T2A", "T2B", "T2C", "T2D"). If multiple claims from a single patient in a single year were identified, only one was counted. Only claims on the outpatient file associated with FQHCs and RHCs were considered. These claims had a provider number with the 3rd and 4th digit in the list ("10", "11", "18" "19", "34", "38", "39", "85", "86", "87", "88", "89") and the 3rd-6th digit were not in the list ("1990", "1991", "1992", "1993", "1994", "1995", "1996", "1997", "1998", "1999")

Case Study Approach

Based on prior interviews and the document review, we selected three topics of interest to investigate in more detail using a case study approach. A case study approach is an ideal method for in-depth and multi-faceted exploration of complex issues in real world settings. It is also a valuable method to capture explanatory information relevant to "why" hospitals chose (or did not choose) to participate in the model, "how" the model is being implemented and received on the ground, and "what" barriers and facilitators impact implementation.[3] The mixed-methods case studies included (1) Recruitment and Participation of System-affiliated Hospitals, (2) Engagement and Coordination with Community Organizations and Providers, and (3) Exploring Service Line Changes, and aimed to achieve the following goals:

- **Recruitment and Participation of System-affiliated Hospitals:** Examine system-affiliated hospitals' motivations for participation and non-participation in the model.
- **Engagement and Coordination with Community Organizations and Providers:** Identify how participating rural hospitals are transforming care through coordination and engagement with primary care providers, community providers, and social service organizations; and examine barriers and facilitators to implementation.
- **Exploring Service Line Changes:** Describe how service line changes have unfolded under the model and the associated influence of model design features on rural hospital decision-making about service line additions, expansions, and contractions.

Parallel methodologies were used to examine each case, including a combination of implementation partner, hospital staff and leadership, community provider, and patient interviews, documentation review, and quantitative data analysis. **Exhibit A.7** illustrates the specific data sources that informed each case study.

Appendix Exhibit A.7. Case Study Data Sources

Case Study	Document Review	Implementation Partner, Hospital, Payer, and Community Partner Interviews			Patient Interviews	Quantitative Data*
		2020	2021	2022	2022	
Recruitment and Participation of System-affiliated Hospitals	X	X	X	X		X
Engagement and Coordination with Community Organizations and Providers	X			X	X	X
Exploring Service Line Changes	X	X	X	X		

NOTE: *See Appendix Exhibit A.4 for the quantitative data sources.

Limitations

Our analysis has several limitations. First, the small number of participants [18 participating hospitals in PY 3 (2021)], which makes most comparisons to eligible non-participating hospitals or national or statewide benchmarks infeasible. Second, due to sample size, our analyses are insufficiently powered to detect impacts in the expected range of 5% or less; thus, we determined an impact analysis was not feasible. The results of our quantitative descriptive analyses cannot be attributed solely to the model. For the descriptive assessment, we are solely observing the trends in outcomes of interest, not isolating the impact of the model on those outcomes. Third, our analyses include qualitative data from only a sample of participating hospital staff, participating payers, and community partners. While this data includes representation from a variety of hospital types (CAH and PPS) and hospital ownership/affiliations (independent and system owned), this data does not include all hospital participants. Finally, the small number of hospitals coupled with important differences in hospital type and affiliation, limits the external generalizability of the findings in our case studies.

Appendix B. Quality Measures

This appendix proposes a comprehensive set of measures and targets for population health outcomes, access, and quality in accordance with the framework and principles outlined in Section 15 of the Pennsylvania Rural Health Model State Agreement as amended and restated (thereafter, the "State Agreement"). These population health outcomes, access, and quality measures and targets will be evaluated under the model and may also be used as the basis for the financial support for participant rural hospitals described in Section 15.c.

Appendix Exhibit B.1. PARHM Quality Measures and Targets

Chronic Conditions – Table 1

Model Goal Domain	Category (Quality, Population Health, or Access)	Measure	Steward	Identifier	Type	Data Source	Anticipated Payer Alignment
Chronic Conditions	Population Health	Inpatient and emergency department (ED) visit for ambulatory care-sensitive conditions	Agency for Health Care Research and Quality	Prevention Quality Indicator 92	Outcome	Claims	Medicare and potentially commercial & managed care payers

Target*: Year over year, the mean rate for rural geographic areas must close the gap with the national rural, non-PA mean rate.

- If the national rural, non-PA rate is decreasing, the rate for rural geographic areas should also decrease (at a rate equal to or greater than the national rural, non-PA rate).

Chronic Conditions – Table 2

Model Goal Domain	Category (Quality, Population Health, or Access)	Measure	Steward	Identifier	Type	Data Source	Anticipated Payer Alignment
Chronic Conditions	Quality	Hospital-Wide All-Cause Readmission	Centers for Medicare & Medicaid Services (CMS)	National Quality Forum 1769	Outcome	Claims	Medicare

Target*: Year over year, the mean rate for rural geographic areas must close the gap with the national rural, non-PA mean rate.

- If the national rural, non-PA rate is decreasing, the rate for rural geographic areas should also decrease (at a rate equal to or greater than the national rural, non-PA rate).

Chronic Conditions – Table 3

Model Goal Domain	Category (Quality, Population Health, or Access)	Measure	Steward	Identifier	Type	Data Source	Anticipated Payer Alignment
Chronic Conditions	Quality	Plan All-Cause Readmission	National Committee for Quality Assurance (NCQA)	HEDIS PCR	Outcome	Claims	Commercial & managed care payers

Target*: Year over year, the mean rate for rural geographic areas must close the gap with the national rural, non-PA mean rate.

- If the national rural, non-PA rate is decreasing, the rate for rural geographic areas should also decrease (at a rate equal to or greater than the national rural, non-PA rate).

Substance Use – Table 1

Model Goal Domain	Category (Quality, Population Health, or Access)	Measure	Steward	Identifier	Type	Data Source	Anticipated Payer Alignment
Substance Use	Quality	Use of Pharmacotherapy for Opioid Use Disorder (OUD)[b]	CMS	National Quality Forum 3400	Process	Claims	Medicare

Target*: Year over year, the mean rate for rural geographic areas must close the gap with the national rural, non-PA mean rate.

- If the national rural, non-PA rate is decreasing, the rate for rural geographic areas should also decrease (at a rate equal to or greater than the national rural, non-PA rate).

Substance Use – Table 2

Model Goal Domain	Category (Quality, Population Health, or Access)	Measure	Steward	Identifier	Type	Data Source	Anticipated Payer Alignment
Substance Use	Quality	Pharmacotherapy for OUD	NCQA	HEDIS POD	Process	Claims	Commercial & managed care payers

Target*: Year over year, the mean rate for rural geographic areas must close the gap with the national rural, non-PA mean rate.

- If the national rural, non-PA rate is decreasing, the rate for rural geographic areas should also decrease (at a rate equal to or greater than the national rural, non-PA rate).

[b] All-payer reporting will use NQF 3400 as the measure, however, given the availability of data for Medicare FFS, pharmacotherapy for OUD will be collected using CMS' Integrated Data Repository data linked to Part D claims. Using this approach, performance for Medicare FFS will report an inverse value relative to NQF 3400 (that is, percent of patients with OUD diagnosis with NO evidence of pharmacotherapy for OUD treatment, rather than percent of patients with OUD diagnosis with pharmacotherapy treatment administered, as stated for NQF 3400).

Substance Use – Table 3

Model Goal Domain	Category (Quality, Population Health, or Access)	Measure	Steward	Identifier	Type	Data Source	Anticipated Payer Alignment
Substance Use	Population Health	Risk of Continued Opioid Use	NCQA	HEDIS COU	Process	Claims	All payer

Target*: Year over year, the mean rate for rural geographic areas must close the gap with the national rural, non-PA mean rate.

- If the national rural, non-PA rate is decreasing, the rate for rural geographic areas should also decrease (at a rate equal to or greater than the national rural, non-PA rate).

Access – Table 1

Model Goal Domain	Category (Quality, Population Health, or Access)	Measure	Steward	Identifier	Type	Data Source	Anticipated Payer Alignment
Access	Quality	Follow-up after ED visit for patients with multiple chronic conditions	NCQA	HEDIS FMC	Process	Claims	All payer

Target*: Year over year, the mean rate for rural geographic areas must close the gap with the national rural, non-PA mean rate.

- If the national rural, non-PA rate is decreasing, the rate for rural geographic areas should also decrease (at a rate equal to or greater than the national rural, non-PA rate).

NOTE: *In the event that the national rural, non-PA rates are trending in a negative direction, a review for exogenous factors would be pursued to understand the cause, and the target would be adjusted appropriately.

Appendix C. Quantitative Measures Tables

Appendix Exhibit C.1. Financial Performance Hospital Participants and Eligible Non-Participants (FY 2013-FY 2020)

Measure	Cohort	Hospital Type	2013	2014	2015	2016	2017	2018	2019	2020	Data Source
Average Total Margin (%)	Participant	All	3.30%	-0.05%	-2.48%	-1.32%	-2.35%	-1.47%	1.42%	6.13%	Medicare Cost Reports
	Participant	CAH	5.14%	-1.06%	-4.59%	-4.23%	-7.71%	-5.95%	4.85%	12.60%	Medicare Cost Reports
	Participant	PPS	2.59%	0.33%	-1.66%	-0.20%	-0.29%	0.39%	-0.01%	3.43%	Medicare Cost Reports
	Eligible Non-Participant	All	3.95%	3.58%	2.51%	4.46%	3.11%	5.42%	3.34%	10.44%	Medicare Cost Reports
	Eligible Non-Participant	CAH	-2.19%	3.10%	1.18%	2.62%	3.55%	10.36%	5.19%	6.48%	Medicare Cost Reports
	Eligible Non-Participant	PPS	5.26%	3.69%	2.79%	4.85%	3.01%	4.22%	2.91%	11.42%	Medicare Cost Reports
Average Operating Margin (%)	Participant	All	-2.81%	-4.40%	-3.83%	-4.59%	-5.94%	-3.61%	-5.56%	-3.64%	Medicare Cost Reports
	Participant	CAH	-1.32%	-9.20%	-6.71%	-6.97%	-9.58%	-9.95%	-6.56%	5.67%	Medicare Cost Reports
	Participant	PPS	-3.43%	-2.40%	-2.62%	-3.60%	-4.43%	-0.73%	-5.10%	-7.87%	Medicare Cost Reports
	Eligible Non-Participant	All	-0.75%	1.46%	2.26%	1.33%	1.06%	2.07%	-1.28%	3.10%	Medicare Cost Reports
	Eligible Non-Participant	CAH	-9.37%	-2.54%	-2.71%	-2.91%	0.21%	-0.18%	-3.18%	-9.24%	Medicare Cost Reports
	Eligible Non-Participant	PPS	1.08%	2.31%	3.32%	2.23%	1.25%	2.61%	-0.84%	6.19%	Medicare Cost Reports

Measure	Cohort	Hospital Type	2013	2014	2015	2016	2017	2018	2019	2020	Data Source
Total Costs - Inpatient Routine Service Costs ($)	Participant	All	$7,056,764.98	$7,253,181.37	$7,488,220.25	$7,441,398.54	$7,506,065.52	$7,177,567.00	$7,130,244.94	$7,166,773.41	Medicare Cost Reports
	Participant	CAH	$2,267,439.40	$2,260,367.00	$2,354,545.20	$2,267,338.80	$2,357,323.80	$2,348,357.80	$2,317,390.00	$2,322,546.60	Medicare Cost Reports
	Participant	PPS	$8,989,405.82	$9,267,936.23	$9,559,816.74	$9,529,291.50	$9,583,741.88	$9,189,737.50	$9,135,601.17	$9,185,201.25	Medicare Cost Reports
	Eligible Non-Participant	All	$13,716,921.01	$13,263,220.29	$13,629,001.02	$13,692,693.80	$14,344,304.89	$14,768,763.87	$15,388,617.19	$16,665,656.49	Medicare Cost Reports
	Eligible Non-Participant	CAH	$3,391,540.00	$3,279,799.89	$3,226,803.16	$3,933,486.44	$3,994,771.77	$3,906,030.95	$4,040,492.07	$4,352,422.96	Medicare Cost Reports
	Eligible Non-Participant	PPS	$15,641,919.22	$15,328,039.24	$15,936,271.70	$15,857,345.29	$16,670,876.45	$17,289,371.91	$17,966,857.04	$19,585,119.78	Medicare Cost Reports
Total Costs - Outpatient Service Costs ($)	Participant	All	$7,056,764.98	$7,253,181.37	$7,488,220.25	$7,441,398.54	$7,506,065.52	$7,177,567.00	$7,130,244.94	$7,166,773.41	Medicare Cost Reports
	Participant	CAH	$2,267,439.40	$2,260,367.00	$2,354,545.20	$2,267,338.80	$2,357,323.80	$2,348,357.80	$2,317,390.00	$2,322,546.60	Medicare Cost Reports
	Participant	PPS	$8,989,405.82	$9,267,936.23	$9,559,816.74	$9,529,291.50	$9,583,741.88	$9,189,737.50	$9,135,601.17	$9,185,201.25	Medicare Cost Reports
	Eligible Non-Participant	All	$13,716,921.01	$13,263,220.29	$13,629,001.02	$13,692,693.80	$14,344,304.89	$14,768,763.87	$15,388,617.19	$16,665,656.49	Medicare Cost Reports
	Eligible Non-Participant	CAH	$3,391,540.00	$3,279,799.89	$3,226,803.16	$3,933,486.44	$3,994,771.77	$3,906,030.95	$4,040,492.07	$4,352,422.96	Medicare Cost Reports
	Eligible Non-Participant	PPS	$15,641,919.22	$15,328,039.24	$15,936,271.70	$15,857,345.29	$16,670,876.45	$17,289,371.91	$17,966,857.04	$19,585,119.78	Medicare Cost Reports
Average Salary: Net Patient Revenue Ratio	Participant	All	0.455	0.448	0.448	0.474	0.494	0.495	0.462	0.512	Medicare Cost Reports
	Participant	CAH	0.462	0.473	0.447	0.451	0.473	0.481	0.487	0.479	Medicare Cost Reports
	Participant	PPS	0.453	0.438	0.448	0.482	0.502	0.501	0.452	0.526	Medicare Cost Reports
	Eligible Non-Participant	All	0.394	0.381	0.374	0.363	0.367	0.357	0.369	0.348	Medicare Cost Reports
	Eligible Non-Participant	CAH	0.398	0.385	0.380	0.364	0.376	0.357	0.374	0.410	Medicare Cost Reports
	Eligible Non-Participant	PPS	0.393	0.380	0.372	0.363	0.365	0.357	0.368	0.333	Medicare Cost Reports

Measure	Cohort	Hospital Type	2013	2014	2015	2016	2017	2018	2019	2020	Data Source
Average Days Cash on Hand (Days)	Participant	All	92.12	92.44	81.05	83.67	88.82	81.23	151.50	143.26	Medicare Cost Reports
	Participant	CAH	45.16	35.71	34.28	37.07	32.50	37.64	113.12	104.11	Medicare Cost Reports
	Participant	PPS	110.18	114.26	99.04	101.59	110.48	99.39	167.49	159.56	Medicare Cost Reports
	Eligible Non-Participant	All	145.29	141.19	141.91	130.28	148.91	149.28	153.76	166.61	Medicare Cost Reports
	Eligible Non-Participant	CAH	139.07	130.93	131.90	131.70	149.70	143.67	108.93	104.92	Medicare Cost Reports
	Eligible Non-Participant	PPS	146.54	143.25	143.91	129.99	148.74	150.55	163.57	181.01	Medicare Cost Reports
Average Long-Term Debt to Capitalization Ratio	Participant	All	0.466	0.529	0.520	0.508	0.526	0.576	0.600	0.530	Medicare Cost Reports
	Participant	CAH	0.609	0.664	0.754	0.767	0.807	0.962	0.717	0.523	Medicare Cost Reports
	Participant	PPS	0.411	0.477	0.430	0.408	0.418	0.415	0.552	0.533	Medicare Cost Reports
	Eligible Non-Participant	All	0.443	0.403	0.464	0.387	0.322	0.281	0.304	0.299	Medicare Cost Reports
	Eligible Non-Participant	CAH	0.444	0.449	0.471	0.432	0.399	0.307	0.313	0.287	Medicare Cost Reports
	Eligible Non-Participant	PPS	0.442	0.395	0.463	0.379	0.308	0.275	0.303	0.301	Medicare Cost Reports

Appendix Exhibit C.2. Total Medicare Spending per FFS Patient Living in Participating or Eligible Non-Participating Market Areas and FORHP-Designated Rural Areas Statewide

Market	2016	2017	2018	2019	2020	2021
Participant	$9,317.00	$9,168.18	$9,172.99	$9,137.68	$8,450.96	$8,588.25
Eligible Non-Participant	$9,341.76	$9,310.18	$9,415.13	$9,404.37	$8,790.33	$8,927.64
FORHP	$9,295.02	$9,115.91	$9,254.55	$9,272.61	$8,616.24	$8,706.91

DEFINITIONS: Participant = Participating Hospital Market Areas (has ever participated in the model), Eligible Non-Participant = Eligible Non-participating Hospital Market Areas (never participated in the model), FORHP = Rural areas as defined by the Federal Office of Rural Health Policy (benchmark)

Appendix Exhibit C.3. Medicare Spending on Global Budget-Covered Services per FFS Patient Living in Participating or Eligible Non-Participating Market Areas and FORHP-Designated Rural Areas Statewide

Market	2016	2017	2018	2019	2020	2021
Participant	$5,127.78	$5,085.11	$5,093.64	$5,074.02	$4,619.67	$4,740.28
Eligible Non-Participant	$5,134.52	$5,186.76	$5,276.47	$5,264.30	$4,881.72	$4,965.34
FORHP	$5,202.30	$5,149.77	$5,258.72	$5,277.03	$4,852.48	$4,924.77

DEFINITIONS: Participant = Participating Hospital Market Areas (has ever participated in the model), Eligible Non-Participant = Eligible Non-participating Hospital Market Areas (never participated in the model), FORHP = Rural areas as defined by the Federal Office of Rural Health Policy (benchmark)

Appendix Exhibit C.4. Global Budget-Covered Spending per Medicare FFS Patient on Outpatient and Inpatient Services

Market	2016	2017	2018	2019	2020	2021
Participant: Inpatient	$3,390.34	$3,271.56	$3,191.29	$3,117.72	$2,801.24	$2,781.97
Participant: Outpatient	$1,912.43	$2,017.00	$2,131.40	$2,215.00	$2,065.97	$2,232.58
Eligible Non-Participant: Inpatient	$3,355.38	$3,340.94	$3,330.01	$3,252.01	$2,995.48	$2,941.11
Eligible Non-Participant: Outpatient	$1,959.65	$2,052.74	$2,176.16	$2,268.60	$2,133.11	$2,301.31

DEFINITIONS: Participant = Participating Hospital Market Areas (has ever participated in the model), Eligible Non-Participant = Eligible Non-participating Hospital Market Areas (never participated in the model)

Appendix Exhibit C.5. Inpatient Admissions per 1,000 Patients in Participating and Eligible Non-Participating Hospitals' Market Areas – Medicaid/CHIP & Medicare FFS

Market	2016	2017	2018	2019	2020	2021
Participant: Medicaid/CHIP	120.50	116.29	118.11	112.35	98.47	N/A
Participant: Medicare FFS	254.46	247.17	236.10	227.20	188.59	184.74
Eligible Non-Participant: Medicaid/CHIP	116.92	113.28	115.38	110.01	95.91	N/A
Eligible Non-Participant: Medicare FFS	247.29	245.01	236.85	227.82	191.38	188.45

DEFINITIONS: Participant = Participating Hospital Market Areas: (has ever participated in the model, Medicaid/CHIP population, Medicare FFS population respectively), Eligible Non-Participant = Eligible Non-participating Hospital Market Areas (never participated in the model, Medicaid/CHIP population, Medicare FFS population respectively), N/A = Data not available

Appendix Exhibit C.6. Average Length of Stay in Participating and Eligible Non-Participating Hospitals' Market Areas

Market	2016	2017	2018	2019	2020	2021
Medicare						
Eligible Non-Participant CAH	5.42	5.45	5.43	5.34	5.74	6.30
Eligible Non-Participant PPS	5.72	5.72	5.68	5.58	5.83	6.11
Participant CAH	5.70	5.84	5.83	5.87	6.06	6.62
Participant PPS	5.87	5.71	5.66	5.64	5.93	6.10
Medicaid						
Participant CAH	5.83	5.73	6.14	6.50	6.40	N/A
Participant PPS	5.94	5.93	6.35	6.52	6.28	N/A
Eligible Non-Participant CAH	5.92	5.89	6.22	6.23	6.46	N/A
Eligible Non-Participant PPS	5.98	6.00	6.33	6.37	6.28	N/A

NOTES: Data for the Medicaid population includes data up to the 99th percentile. Outliers comprised of very long stays dominated the trend when included.

DEFINITIONS: Participant CAH = Participating Critical Access Hospital Market Areas (has ever participated in the model), Participant PPS = Participating Prospective Payment System Hospital Market Areas (has ever participated in the model), Eligible Non-Participant CAH = Eligible Non-participating Critical Access Hospital Market Areas (never participated in the model), Eligible Non-Participant PPS = Eligible Non-participating Prospective Payment System Hospital Market Areas (never participated in the model), N/A = Data not available

Appendix Exhibit C.7. Emergency Department Utilization Among the Medicare FFS and Medicaid/CHIP Population in Participating and Eligible Non-Participating Market Areas

Market	2016	2017	2018	2019	2020	2021
Medicare						
Participant	512.80	507.61	490.13	480.85	374.19	393.23
Eligible Non-Participant	492.55	494.64	478.84	463.42	357.55	382.01
Medicaid						
Participant	147.13	136.02	93.48	100.22	131.79	N/A
Eligible Non-Participant	226.51	207.40	169.10	176.94	170.82	N/A
Participant (Narrow Market Areas)	137.45	127.67	76.95	79.57	124.21	N/A

DEFINITIONS: Participant = Participating Hospital Market Areas: (has ever participated in the model, Medicare FFS population, Medicaid/CHIP population, respectively), Eligible Non-Participant = Eligible Non-participating Hospital Market Areas (never participated in the model, Medicare FFS population, Medicaid/CHIP population, respectively), Narrow Market Areas = Participating Hospital Narrow Market Areas, Medicaid/CHIP population, N/A = Data not available

Appendix Exhibit C.8. Medicare FFS Initial Preventive Physical Examination and Annual Wellness Visit Utilization

Market	2016	2017	2018	2019	2020	2021
Participant	230.21	259.43	291.91	345.94	339.59	383.14
Eligible Non-Participant	219.92	251.53	278.53	333.31	340.59	385.12

DEFINITIONS: Participant = Participating Hospital Market Areas (has ever participated in the model), Eligible Non-Participant = Eligible Non-participating Hospital Market Areas (never participated in the model)

Appendix Exhibit C.9. Average Share of Global Budget Spending Incurred in Non-Participating System-Affiliates Across System-Affiliated Participating Hospitals

Market	2016	2017	2018	2019	2020	2021
Participant	29.8%	31.5%	36.9%	36.9%	37.4%	36.7%
Participant (Narrow Market Areas)	13.3%	15.6%	24.7%	25.1%	27.1%	26.3%

DEFINITIONS: Participant = Participating Hospital Market Areas (has ever participated in the model), Narrow Market Areas = Participating Hospital Narrow Market Areas (has ever participated in the model)

Appendix Exhibit C.10. Total Counts of Continuously Enrolled Medicare and Medicaid & CHIP Patients in Select Market Areas

Market	2016	2017	2018	2019	2020	2021
Medicare						
Participant	363,824	399,176	405,283	410,258	416,154	420,427
Eligible Non-Participant	752,186	828,613	842,525	854,918	868,751	877,928
Medicaid						
Participant	291,916	297,279	310,195	301,872	325,808	N/A
Eligible Non-Participant	615,870	630,185	657,027	642,465	698,304	N/A

DEFINITIONS: Participant = Participating Hospital Market Areas (has ever participated in the model), Eligible Non-Participant = Eligible Non-participating Hospital Market Areas (never participated in the model), N/A = Data not available

Appendix Exhibit C.11. Medicare HMO Penetration Among Continuously Enrolled Medicare Patients in Select Market Areas

Market	2016	2017	2018	2019	2020	2021
Participant	43.2%	41.7%	42.8%	44.1%	46.3%	48.4%
Eligible Non-Participant	36.4%	35.3%	36.3%	37.7%	39.9%	42.3%

DEFINITIONS: Participant = Participating Hospital Market Areas (has ever participated in the model), Eligible Non-Participant = Eligible Non-participating Hospital Market Areas (never participated in the model)

Appendix Exhibit C.12. Total Medicare Spending per 1,000 FFS Patients in Select Market Areas

Market	2016	2017	2018	2019	2020	2021
Participant CAH	$9,394.28	$9,444.71	$9,340.87	$9,441.68	$8,664.98	$8,884.62
Participant PPS	$9,286.18	$9,048.72	$9,097.69	$9,010.81	$8,359.43	$8,466.78
Participant (Narrow Market Areas)	$9,298.05	$9,042.08	$8,997.47	$8,949.93	$8,191.74	$8,409.28
Participant (Care Coordination Focus)	$9,285.10	$9,022.09	$9,125.01	$9,043.82	$8,359.39	$8,450.72
Eligible Non-Participant CAH	$9,309.41	$9,170.96	$9,290.35	$9,140.59	$8,696.79	$8,660.05
Eligible Non-Participant PPS	$9,360.32	$9,329.76	$9,422.95	$9,422.58	$8,799.71	$8,939.19
Eligible Non-Participant (Narrow Market Areas)	$9,391.38	$9,336.75	$9,498.71	$9,476.73	$8,809.36	$8,853.95

DEFINITIONS: Participant CAH = Participating Critical Access Hospital Market Areas (has ever participated in the model), Participant PPS = Participating Prospective Payment System Hospital Market Areas (has ever participated in the model), Participant (Narrow Market Areas) = Participating Hospital Narrow Market Areas (has ever participated in the model), Participant (Care Coordination Focus) = Participating Hospital Market Areas Focused on Care Coordination for Patients with Complex Needs, Eligible Non-Participant CAH = Eligible Non-participating Critical Access Hospital Market Areas (never participated in the model), Eligible Non-Participant PPS = Eligible Non-participating Prospective Payment System Hospital Market Areas (never participated in the model), Eligible Non-Participant (Narrow Market Areas) = Eligible Non-participating Hospital Narrow Market Areas (never participated in the model)

Appendix Exhibit C.13. Medicare Spending on Global Budget-Covered Services per 1,000 Patients in Select Market Areas

Market	2016	2017	2018	2019	2020	2021
Participant CAH	$5,209.17	$5,299.80	$5,238.27	$5,305.66	$4,795.00	$4,962.26
Participant PPS	$5,092.81	$4,992.30	$5,029.75	$4,977.12	$4,545.52	$4,650.10
Participant (Narrow Market Areas)	$5,162.64	$5,023.69	$4,997.67	$4,948.88	$4,490.11	$4,638.43
Eligible Non-Participant CAH	$5,287.69	$5,299.15	$5,418.61	$5,308.06	$4,990.53	$5,011.16
Eligible Non-Participant PPS	$5,133.52	$5,186.47	$5,266.30	$5,265.13	$4,877.12	$4,956.58
Eligible Non-Participant (Narrow Market Areas)	$5,213.15	$5,236.67	$5,381.67	$5,373.45	$4,908.68	$4,952.58

DEFINITIONS: Participant CAH = Participating Critical Access Hospital Market Areas (has ever participated in the model), Participant PPS = Participating Prospective Payment System Hospital Market Areas (has ever participated in the model), Participant (Narrow Market Areas) = Participating Hospital Narrow Market Areas (has ever participated in the model), Eligible Non-Participant CAH = Eligible Non-participating Critical Access Hospital Market Areas (never participated in the model), Eligible Non-Participant PPS = Eligible Non-participating Prospective Payment System Hospital Market Areas (never participated in the model), Eligible Non-Participant (Narrow Market Areas) = Eligible Non-participating Hospital Narrow Market Areas (never participated in the model)

Appendix Exhibit C.14. Average Length of Stay (in Days) Among the Medicare FFS and Medicaid/CHIP Population in Select Market Areas

Market	2016	2017	2018	2019	2020	2021
Medicare						
Participant	5.82	5.75	5.71	5.71	5.97	6.26
Eligible Non-Participant	5.69	5.69	5.65	5.56	5.81	6.11
Medicaid						
Participant	6.15	6.12	7.18	8.63	6.71	N/A
Participant CAH	5.98	5.87	6.73	8.23	6.69	N/A
Participant PPS	6.21	6.20	7.31	8.75	6.72	N/A
Eligible Non-Participant	6.17	6.19	7.00	7.98	6.69	N/A
Eligible Non-Participant CAH	6.08	6.08	7.05	7.90	7.08	N/A
Eligible Non-Participant PPS	6.19	6.21	7.02	8.03	6.70	N/A

DEFINITIONS: Participant = Participating Hospital Market Areas (has ever participated in the model), Participant CAH = Participating Critical Access Hospital Market Areas (has ever participated in the model), Participant PPS: Participating Prospective Payment System Hospital Market Areas (has ever participated in the model), Eligible Non-Participant = Eligible Non-participating Hospital Market Areas (never participated in the model), Eligible Non-Participant CAH = Eligible Non-participating Critical Access Hospital Market Areas (never participated in the model), Eligible Non-Participant PPS = Eligible Non-participating Prospective Payment System Hospital Market Areas (never participated in the model), N/A = Data not available

Appendix Exhibit C.15. Emergency Department Utilization Among the Medicaid/CHIP and Medicare FFS and Population in Select Market Areas (Rate Per 1,000 Patients)

Market	2016	2017	2018	2019	2020	2021
Medicare						
Participant (Narrow Market Areas)	506.98	503.37	485.24	473.00	368.38	389.39
Participant (CHF Focus)	523.93	504.10	483.85	472.36	363.62	384.52
Participant (COPD Focus)	517.08	501.52	482.99	470.36	366.41	387.24
Participant (Diabetes Focus)	487.28	473.03	459.55	446.44	342.09	360.73
Eligible Non-Participant (Narrow Market Areas)	519.49	516.67	500.38	483.38	373.92	390.85

DEFINITIONS: Participant (Narrow Market Areas) = Participating Hospital Narrow Market Areas (has ever participated in the model), Participant (CHF Focus) = Participating Hospital Market Areas Focused on Care Coordination for Patients with CHF, Participant (COPD Focus) = Participating Hospital Market Areas Focused on Care Coordination for Patients with COPD, Participant (Diabetes Focus) = Participating Hospital Market Areas Focused on Care Coordination for Patients with Diabetes, Eligible Non-Participant (Narrow Market Areas) = Eligible Non-participating Hospital Narrow Market Areas (never participated in the model)

Appendix Exhibit C.16. Observation Stay Utilization Among the Medicaid/CHIP and Medicare FFS and Population in Participating and Eligible Non-Participating Market Areas (Rate Per 1,000 Patients)

Market	2016	2017	2018	2019	2020	2021
Medicare						
Participant	64.26	64.52	65.75	63.33	48.31	45.26
Eligible Non-Participant	61.58	63.42	60.94	59.35	46.11	45.22
Medicaid						
Participant	0.45	0.62	0.80	1.66	7.97	N/A
Eligible Non-Participant	3.15	3.13	3.09	3.15	6.38	N/A

DEFINITIONS: Participant = Participating Hospital Market Areas (has ever participated in the model), Eligible Non-Participant = Eligible Non-participating Hospital Market Areas (never participated in the model), N/A = Data not available

Appendix Exhibit C.17. Evaluation and Management Utilization Among the Medicaid/CHIP and Medicare FFS and Population in Select Market Areas

Market	2016	2017	2018	2019	2020	2021
Medicare						
Participant	13,617.40	13,698.46	13,665.23	13,652.25	12,134.90	12,814.87
Participant (Primary Care)	13,661.27	13,813.16	13,748.81	13,738.15	12,252.01	12,900.97
Eligible Non-Participant	14,054.48	14,133.21	14,129.31	14,045.09	12,533.63	13,243.38

DEFINITIONS: Participant = Participating Hospital Market Areas (has ever participated in the model), Participant (Primary Care) = Participating Hospital Market Areas Focused on improving access to and redesigning primary care services, Eligible Non-Participant = Eligible Non-participating Hospital Market Areas (never participated in the model)

Appendix Exhibit C.18. Rates of 30-day Follow-Up Care following an Alcohol or Other Drug Abuse-related Emergency Department Visit in Select Market Areas

Market	2016	2017	2018	2019	2020	2021
Medicaid						
Participant	25.63%	27.17%	29.24%	31.19%	30.93%	
Participant (SUD/OUD)	24.49%	26.48%	25.30%	22.17%	29.25%	
Eligible Non-Participant	24.08%	25.75%	28.15%	29.86%	29.98%	

DEFINITIONS: Participant = Participating hospital market areas (has ever participated in the model), Participant (SUD/OUD) = Participating Hospital Market Areas Focused on SUD/OUD Outreach, Eligible Non-Participant = Eligible Non-participating hospital market areas (never participated in the model)

Appendix Exhibit C.19. Rates of 180-Day Adherence to Pharmacotherapy for OUD in Select Market Areas

Market	2016	2017	2018	2019	2020	2021
Medicaid						
Participant	N/A	27.73%	29.35%	21.47%	24.38%	N/A
Participant (MAT)	N/A	19.12%	19.50%	18.26%	21.55%	N/A
Eligible Non-Participant	N/A	26.59%	29.11%	22.27%	25.10%	N/A

NOTES: A lookback year is required for this measure and 2015 data were unavailable. Only 2017-2020 were calculated.
DEFINITIONS: Participant = Participating hospital market areas (has ever participated in the model), Participant (MAT) = Participating Hospital Market Areas Focused on expanding MAT, Eligible Non-Participant = Eligible Non-participating hospital market areas (never participated in the model), N/A = Data not available, MAT = medication-assisted treatment

Appendix Exhibit C.20. Rates of Opioid Overprescribing (>30 Days in a 62 Day Period) in Select Market Areas

Market	2016	2017	2018	2019	2020	2021
Medicaid						
Participant	N/A	3.56%	5.42%	5.30%	4.93%	N/A
Participant (MAT)	N/A	3.79%	6.08%	5.88%	5.09%	N/A
Eligible Non-Participant	N/A	3.96%	4.74%	4.64%	4.34%	N/A

NOTES: A lookback year is required for this measure and 2015 data were unavailable. Only 2017-2020 were calculated.
DEFINITIONS: Participant = Participating hospital market areas (has ever participated in the model), Participant (MAT) = Participating Hospital Market Areas Focused on expanding MAT, Eligible Non-Participant = Eligible Non-participating hospital market areas (never participated in the model), MAT = medication-assisted treatment

Appendix Exhibit C.21. Ambulance Utilization Among the Medicare FFS Population in Participating and Eligible Non-Participating Market Areas (Rate Per 1,000 Patients)

Market	2016	2017	2018	2019	2020	2021
Participant	8.33	8.51	8.56	9.83	8.50	7.97
Eligible Non-Participant	4.10	4.54	4.61	5.34	4.37	4.49

DEFINITIONS: Participant = Participating Hospital Market Areas (has ever participated in the model), Eligible Non-Participant = Eligible Non-participating Hospital Market Areas (never participated in the model)

Appendix Exhibit C.22. Annual Wellness Visits Among the Medicare FFS Population in Select Market Areas (Rate Per 1,000 Patients)

Market	2016	2017	2018	2019	2020	2021
Participant CAH	210.82	234.55	257.02	291.38	284.12	309.39
Participant PPS	238.23	269.88	306.45	368.54	362.86	413.95
Participant (Narrow Market Areas)	191.61	216.89	253.76	316.51	315.83	364.54
Eligible Non-Participant CAH	284.79	316.02	341.98	375.67	366.57	395.22
Eligible Non-Participant PPS	219.44	251.63	277.70	332.64	340.91	386.33
Eligible Non-Participant (Narrow Market Areas)	232.20	264.26	287.70	338.93	344.45	383.22

DEFINITIONS: Participant CAH = Participating Critical Access Hospital Market Areas (has ever participated in the model), Participant PPS = Participating Prospective Payment System Hospital Market Areas (has ever participated in the model), Participant (Narrow Market Areas) = Participating Hospital Narrow Market Areas (has ever participated in the model), Eligible Non-Participant CAH = Eligible Non-participating Critical Access Hospital Market Areas (never participated in the model), Eligible Non-Participant PPS = Eligible Non-participating Prospective Payment System Hospital Market Areas (never participated in the model), Eligible Non-Participant (Narrow Market Areas) = Eligible Non-participating Hospital Narrow Market Areas (never participated in the model)

Appendix Exhibit C.23. Annual Wellness Visits Among the Medicare FFS Population in Select Market Areas (Rate Per 1,000 Patients)

Market	2016	2017	2018	2019	2020	2021
Participant CAH	210.82	234.55	257.02	291.38	284.12	309.39
Participant PPS	238.23	269.88	306.45	368.54	362.86	413.95
Participant (Narrow Market Areas)	191.61	216.89	253.76	316.51	315.83	364.54
Eligible Non-Participant CAH	284.79	316.02	341.98	375.67	366.57	395.22
Eligible Non-Participant PPS	219.44	251.63	277.70	332.64	340.91	386.33
Eligible Non-Participant (Narrow Market Areas)	232.20	264.26	287.70	338.93	344.45	383.22

DEFINITIONS: Participant CAH = Participating Critical Access Hospital Market Areas (has ever participated in the model), Participant PPS = Participating Prospective Payment System Hospital Market Areas (has ever participated in the model), Participant (Narrow Market Areas) = Participating Hospital Narrow Market Areas (has ever participated in the model), Eligible Non-Participant CAH = Eligible Non-participating Critical Access Hospital Market Areas (never participated in the model), Eligible Non-Participant PPS = Eligible Non-participating Prospective Payment System Hospital Market Areas (never participated in the model), Eligible Non-Participant (Narrow Market Areas) = Eligible Non-participating Hospital Narrow Market Areas (never participated in the model)

Appendix Exhibit C.24. Imaging Utilization Among the Medicare FFS Population in Participating and Eligible Non-Participating Market Areas (Rate Per 1,000 Patients)

Market	2016	2017	2018	2019	2020	2021
Participant	4,409.12	4,276.72	4,275.16	4,363.91	3,748.28	4,148.23
Eligible Non-Participant	4,449.34	4,326.96	4,368.59	4,449.68	3,822.04	4,232.58

DEFINITIONS: Participant = Participating Hospital Market Areas (has ever participated in the model), Eligible Non-Participant = Eligible Non-participating Hospital Market Areas (never participated in the model)

Appendix Exhibit C.25. Procedures Among the Medicare FFS Population in Participating and Eligible Non-Participating Market Areas (Rate Per 1,000 Patients)

Market	2016	2017	2018	2019	2020	2021
Participant	7,192.56	7,277.06	7,393.62	7,552.75	6,623.54	7,539.44
Eligible Non-Participant	7,328.04	7,458.72	7,570.99	7,816.34	6,808.08	7,699.10

DEFINITIONS: Participant = Participating Hospital Market Areas (has ever participated in the model), Eligible Non-Participant = Eligible Non-participating Hospital Market Areas (never participated in the model)

Appendix Exhibit C.26. Testing Utilization Among the Medicare FFS Population in Participating and Eligible Non-Participating Market Areas (Rate Per 1,000 Patients)

Market	2016	2017	2018	2019	2020	2021
Participant	7,033.95	7,012.33	7,027.70	6,990.41	6,456.05	7,274.19
Eligible Non-Participant	8,365.78	8,327.45	8,364.79	8,355.96	7,836.34	8,831.64

DEFINITIONS: Participant = Participating Hospital Market Areas (has ever participated in the model), Eligible Non-Participant = Eligible Non-participating Hospital Market Areas (never participated in the model)

Appendix Exhibit C.27. Percent of Global Budget-Covered Spending Among Medicare FFS Patients Living in Hospital Market Areas that Occurs Outside the Market Area

Market	2016	2017	2018	2019	2020	2021
Participant	58.5%	58.5%	59.2%	60.1%	60.6%	61.5%
Participant (Narrow Market Areas)	59.4%	60.8%	62.1%	62.6%	63.1%	64.7%
Eligible Non-Participant	57.0%	57.4%	57.2%	58.2%	58.9%	58.9%
Eligible Non-Participant (Narrow Market Areas)	60.3%	61.1%	61.3%	61.9%	62.9%	62.2%

DEFINITIONS: Participant = Participating Hospital Market Areas (has ever participated in the model), Participant (Narrow Market Areas) = Participating Hospital Narrow Market Areas (has ever participated in the model), Eligible Non-Participant = Eligible Non-participating Hospital Market Areas (never participated in the model), Eligible Non-Participant (Narrow Market Areas) = Eligible Non-participating Hospital Narrow Market Areas (never participated in the model)

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1. Commonwealth of Pennsylvania, Centers for Medicare and Medicaid Services. *First Amended and Restated Pennsylvania Rural Health Model State Agreement*. 2018.

2. The Lewin Group. Memorandum "Pennsylvania Rural Health Model Service Area Methodology. February 2019.

3. Yin RK. *Case study research: Design and methods*. Sixth ed. Thousand Oaks, CA: Sage Publications; 2017.