

Maryland Model Analytics

Evaluation of the Care Transformation Initiatives Program: Year 1 Review

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Executive Summary

Care Transformation Initiatives (CTIs) were implemented in 2021 by Maryland’s Health Services Cost Review Commission (HSCRC) as a component of the Maryland Total Cost of Care Model. Hospitals in Maryland volunteered to participate in this program to test new interventions that addressed specific clinical and health-related needs and promoted efficient use of health care resources. Hospitals with CTIs that produced savings could earn a positive payment adjustment on future Medicare payments. By testing and evaluating the results of hospitals’ care transformation efforts, the state hoped to identify and disseminate best practices for improving care and reducing costs.

Under a contract with the Chesapeake Regional Information System for Our Patients (CRISP), AIR conducted a two-part evaluation of the CTI program. We completed a [preimplementation](#) report in 2021 summarizing the design and target areas of the proposed CTIs. This second report presents findings from the first complete year of the program (2021-2022). For this report, we conducted a mixed-methods evaluation of the CTI program to (a) learn about the ways hospitals selected and implemented their CTIs, (b) determine the successes and challenges that each hospital encountered in the first year, (c) understand which CTIs were found to be reducing the cost of care, and (d) understand the ways in which HSCRC and CRISP could improve the CTI program in future program years. AIR conducted an independent quantitative analysis of the CTI data in February 2023 using data provided by CRISP. Because Year 1 performance data were not finalized at the time of this evaluation, the results presented in this report should be considered preliminary and may not be equivalent to cost calculations conducted by HSCRC. We found the following:

- **Thirty-three (32%) CTIs generated savings.** CTIs across all thematic areas, in varying care settings and with varying numbers of episodes, were found to save money compared with baseline costs. Additional experience with the CTI program will be necessary to identify specific CTI characteristics that yield the greatest savings.
- **On average, across all CTIs, performance year costs exceeded baseline costs by more than \$1 million.** However, between two thematic areas, Care Transitions and Primary Care, there were 25 CTIs with average performance year costs below baseline costs, representing areas of savings within the program. These two thematic areas were the largest, both by number of CTIs and by total number of patients.
- **CTIs with a focus on social determinants of health (SDOH) performed better, on average, than other CTIs.** Within the Primary Care thematic area, the nine CTIs with an SDOH focus

generated an average of more than \$514,000 in savings, whereas the 13 other CTIs in this thematic area were above baseline costs by an average of nearly \$450,000.

- **The majority (86%) of hospitals that responded to our survey reported that the implementation of their CTI was either positive or somewhat positive.** The ability to use existing care transformation activities, such as the Maryland Primary Care Program, within the CTI program meant that many hospitals were able to leverage existing workflow and expertise when implementing the CTI program.
- **Seventy-five percent of CTIs had fewer episodes during the performance year than at baseline.** CTIs with fewer than expected episodes may have generated less savings than if they had had more episodes. A lower number of episodes may be attributed to less health care utilization during the COVID-19 pandemic or overlapping episodes for a single patient, which would cause the second episode to be dropped from the CTI program (discussed further in the Findings section).
- **The majority of interview and survey responses mentioned data access as an area for improvement.** Participating hospitals were challenged by the lag in CTI data within the CRISP data portal and by limited ability to drill down into CTI data to determine which specific patients and claims were attributed to particular CTIs.
- **Nearly 95% of hospitals plan to continue the program in the second performance year.** All interviewed hospitals planned to continue participation beyond year one. Many were planning to modify their CTIs by changing the trigger events or the episode lengths and included costs. Some hospitals are narrowing participation to only CTIs that were found to be most successful in Year 1.

Data from additional performance years will help yield additional insights into CTI interventions that are most effective, which will allow participating organizations to iterate their program designs to maximize future savings. There are several programmatic changes that can facilitate this improvement. First, CRISP should work with hospitals to maximize the utility of data currently available in the portal, while exploring options to expand data capabilities to help CTI participants track their patients and costs on a more frequent basis. Second, CRISP should develop case studies and expand the learning collaborative so that hospitals with successful CTIs can share lessons learned with other organizations, especially those that have successfully launched CTIs that address SDOH. Finally, the HSCRC and CRISP should consider targeted technical assistance to hospitals to help them understand the way the cost methodology has affected the target price and cost outcomes of their CTIs.

Overview of Care Transformation Initiatives

In 2019, the Maryland Health Services Cost Review Commission (HSCRC) established the Care Transformation Initiative (CTI) to meet CMS' requirements while allowing hospitals the flexibility to define their own episodes of care and test interventions to determine whether they reduce costs. The CTI framework uses a four-part process to quantify the way in which care transformation affects costs:¹

- Step 1. Identify a patient population.
- Step 2. Construct a clinical episode.
- Step 3. Use historical data to establish a target price.
- Step 4. Compare the total cost of care during the performance year with the target price to determine whether the CTI has achieved savings.

Hospitals that conduct CTIs can earn additional payments by achieving savings for their defined episodes during a performance year. To fund these additional payments in a cost-neutral way, the state will reduce payments to all hospitals, including those that choose not to participate in the CTI program.

During 2021, 104 CTIs (Appendix D) were implemented by hospitals (CTI participants) and conducted for the full performance year. This evaluation uses performance year data provided by CRISP in early 2023, which allowed for the majority of episodes to finalize in claims data. In CTIs where episodes lasted 180-days, not all episodes were complete at the time of this analysis.

In its role as a program administrator, the Chesapeake Regional Information System for Our Patients (CRISP), which operates the health information exchange (HIE) for Maryland and acts as a program administrator for many HSCRC Care Transformation programs, developed the Care Transformation Profiler (CTP), an online data tool, so that hospitals can track costs on a monthly basis during the performance year. The CTP uses dashboards and reports that aggregate Medicare claims data and show the hospitals' performance on their CTIs month to month. CRISP also sponsors a learning collaborative that provides CTI participants with best practices, technical assistance, and feedback on their performance under the program.

¹ A detailed description of the CTI methodology can be found in the "Care Transformation Initiative User Guide." We note that this methodology was being updated at the time of this report, and a revised document will be published by HSCRC. https://hscrc.maryland.gov/Documents/Care%20Redesign/Steering%20Committee/DRAFT%20CTI%20User%20Guide_vF.docx

As part of this role, CRISP selected American Institutes for Research (AIR) to evaluate the CTI program after its first year of implementation. AIR also completed a [preimplementation](#) report that used current literature to compare extant care transformation interventions with those being proposed by hospitals as a part of the CTI program.

Data, Methods, and Analysis

AIR used a mixed-methods approach to evaluate the first complete year of the CTI program. This section describes the qualitative and quantitative data sources and the methods we used to conduct our analyses.

CTI Data. We analyzed descriptive data on CTIs that were active during the first performance year of the program (2021-2022) and current with data provided by CRISP as of February 2023. The data included baseline information on each CTI, such as thematic area, the preliminary target price for each episode, the number of baseline episodes, a brief summary of the interventions and whether these had a social determinants of health (SDOH) focus, specific diagnosis-related groups or conditions targeted (if applicable), and the episode length. Data also included the performance year number of episodes and total cost per episode. AIR conducted an independent quantitative analysis of the CTI data in February 2023 using data provided by CRISP. Because Year 1 performance data were not finalized at the time of this evaluation, the results presented in this report should be considered preliminary and may not be equivalent to cost calculations conducted by HSCRC.

We analyzed CTI data to summarize and describe the following:

- Total cost of each CTI compared with the total target cost
- Total per-episode cost of each CTI compared with the target per-episode cost
- Comparison of the number of episodes for each CTI during the performance year and at baseline
- Average CTI total cost compared with target cost for CTIs that identify as having an SDOH focus
- Average total cost compared with target total cost, by thematic area

Survey. We used a survey of 12 questions (Appendix B) asking CTI participants about their reasons for participating in the CTI program, the type of care transformation they were undertaking, any challenges to implementing the CTI, any successes from their organization's

CTI and other open-ended questions that would help us understand the context in which the CTI was being conducted.

We fielded the online survey to 92 participating organization representatives provided by CRISP and received 21 responses; not all respondents answered every question. We reviewed and qualitatively coded the responses to identify key themes.

Key Informant Interviews. We conducted 45-minute interviews with representatives from seven hospitals that participated in the first year of the CTI program to gather information on the details of each hospital’s CTI, the implementation process, any successes and challenges from the first year of the program, CTIs (if any) that were found to be reducing costs, and feedback for CRISP and HSCRC staff on improving the program for the second year.

The interviews were semistructured discussions conducted by a researcher and recorded by a notetaker (Appendix C). We also audio recorded each interview to ensure that our notes were accurate. We conducted a qualitative analysis of the interviews to identify common themes.

Limitations. There are several limitations to this evaluation. First, at the time data was received for analysis, not all episodes had been completed and not all cost adjustments from the CTI methodology had been applied. This means that total cost data presented in this report should not be considered final. Second, we did not receive survey and interview feedback from all CTI participants, which means there may be perspectives not included in this report. Third, In order to minimize administrative burden, hospitals were required to submit only limited information on their specific interventions which limited our ability to link specific interventions to savings beyond the thematic area level.

Findings

This section summarizes the key findings of our evaluation. We begin by providing an analysis of the total costs and per-episode costs by thematic area and for the top-performing CTIs. We then provide an analysis of key characteristics of the top performing CTIs, along with lessons learned that were shared through the survey and interviews conducted with participating hospitals. Finally, we list suggestions from participating hospitals on improvements that CRISP and HSCRC can make to the CTI program for future years. (See Appendix A for a detailed background of thematic areas and a comparison of patient and episode data at baseline and during the performance year.)

More than 100 CTIs were implemented across five thematic areas for the full performance year. This evaluation includes the 104² CTIs that were implemented by hospitals in the first year of the program and that had complete data available at the time of our analysis. These CTIs covered 243,081 Medicare fee-for-service beneficiaries in Maryland, which is nearly a quarter of the 1 million beneficiaries who have Medicare Parts A and B coverage in any given month. Nearly 75% of first-year CTIs were in Care Transitions or Primary Care (Table 1).

Table 1. Number of CTIs, by Thematic Area and Number of Patients

Thematic area	Number of CTIs	Total number of patients at baseline	Total number of patients at Year 1
Care Transitions	55	35,612	22,148
Community-Based Care	10	29,985	29,731
Emergency Care	13	17,314	13,411
Palliative Care	4	986	494
Primary Care	22	149,331	177,297
Total	104	233,228	243,081

CTIs vary widely in the number of episodes available in baseline data and the number of episodes completed during the performance year (Table 2), although the range in the number of episodes for each thematic area is similar at baseline and during the performance year. This variation reflects differences in patient populations and length of episodes.

Table 2. Number of Baseline and Performance Year Episodes per CTI, by Thematic Area

Thematic area	Mean		Minimum		Maximum	
	Baseline	Performance	Baseline	Performance	Baseline	Performance
Care Transitions	713	432	15	1*	2,907	2,321
Community-Based Care	3,050	2,989	29	26	22,556	24,970
Emergency Care	1,624	1,207	13	1*	5,531	3,393
Palliative Care	168	124	1*	24	342	223
Primary Care	7,262	8,087	82	76	32,525	35,642

² CRISP assigns a numeric identifier for each unique CTI; the identifier corresponds to a defined set of interventions, an episode length, and criteria for selecting the patient population. There are 92 unique CTIs. However, the same CTI may be conducted by more than one hospital. In these cases, the CTI definition is the same but each hospital has different baseline costs and will be evaluated individually for cost savings. Of the 92 unique CTIs, eight are being conducted at more than one hospital, and we treat each of these as a unique CTI.

Note. *Episode counts are masked when there are fewer than 12 episodes, as CTIs with fewer than 12 episodes are disqualified from final cost calculations.

The final target price of each CTI are updated from the baseline period to account for risk adjustment and inflation. We see that there are small differences in target price between the preliminary and final calculations, with a higher mean target price for Care Transitions, Community-Based Care, and Emergency Care and a lower mean target price for Palliative Care and Primary Care. This change in target price is due to differences between the baseline and performance years in the APR-DRG case mix within these thematic areas (Table 3). This change in case mix could be due to variation in utilization caused by the COVID-19 pandemic.

Table 3. Preliminary and Final Target Price, by Thematic Area

Thematic area	Minimum		Mean		Median		Maximum	
	Preliminary	Final	Preliminary	Final	Preliminary	Final	Preliminary	Final
Care Transitions	\$9,048	\$9,243	\$34,438	\$36,027	\$34,805	\$35,976	\$87,369	\$101,008
Community-Based Care	\$12,027	\$11,161	\$27,378	\$28,648	\$29,092	\$30,027	\$43,831	\$43,798
Emergency Care	\$8,203	\$7,763	\$14,552	\$14,781	\$11,165	\$12,282	\$29,871	\$28,953
Palliative Care	\$34,417	\$34,774	\$48,808	\$42,040	\$42,287	\$42,784	\$88,197	\$49,572
Primary Care	\$3,952	\$3,791	\$14,562	\$13,046	\$13,502	\$12,662	\$35,182	\$36,271

Note. Estimated Final Target Prices reflect data available as of February 2023 and should not be considered final.

The majority of Maryland hospitals participated in the CTI program, and most were motivated by the potential to earn savings. Forty-three hospitals (or 90% of Maryland hospitals) led CTIs during the 2021–2022 performance year. We surveyed CTI participants to understand why they had participated in the CTI program and why they had chosen the clinical areas they did. Reasons for participation varied among the 21 survey respondents: common responses were to receive credit for work already occurring (6); the opportunity to receive incentive payments (8); and the chance to participate in a formalized, structured approach to care and quality improvement. These survey results confirmed responses from hospitals surveyed during the preimplementation period about decisions to participate in the program.

We also asked CTI participants whether they had designed CTIs to address clinical areas or patient populations that represented elevated areas of spending. The survey results were

divided: 10 respondents said that their CTIs were intended to address an area of high spending, whereas another 11 said that this was not the purpose of their CTIs. Six survey respondents said that their CTIs had a focus on racial/ethnic minorities or low-income populations, which indicates that some CTIs could be shown to address SDOH.

On average, across all CTIs, mean total costs in excess of target total costs were \$1,053,974. Breaking down the data by thematic area, CTIs related to Primary Care were shown to perform closer to target costs, on average, than did other thematic areas (Table 4 **Error! Reference source not found.**). There was wide variation in CTI performance in each thematic area, with Emergency Care CTIs, on average, having mean total spending over target of \$2,353,462 and CTIs in the Primary Care thematic area having mean total spending over target of \$36,631.

Table 4. Difference between Total Target Costs and Total Performance Costs

Thematic area	Minimum	25th percentile	Median	Mean	75th percentile	Maximum
Care Transitions	(\$17,072,966)	(\$1,418,973)	(\$414,767)	(\$1,282,761)	\$48,498	\$1,267,724
Community-Based Care	(\$6,283,791)	(\$1,280,090)	(\$741,653)	(\$654,570)	\$153,237	\$4,939,703
Emergency Care	(\$13,556,289)	(\$2,156,208)	(\$579,958)	(\$2,353,462)	(\$46,807)	\$247,297
Palliative Care	(\$3,274,915)	(\$1,069,994)	(\$75,674)	(\$463,637)	\$530,683	\$1,571,716
Primary Care	(\$8,444,878)	(\$4,453,864)	(\$702,290)	(\$36,631)	\$1,523,734	\$16,228,537

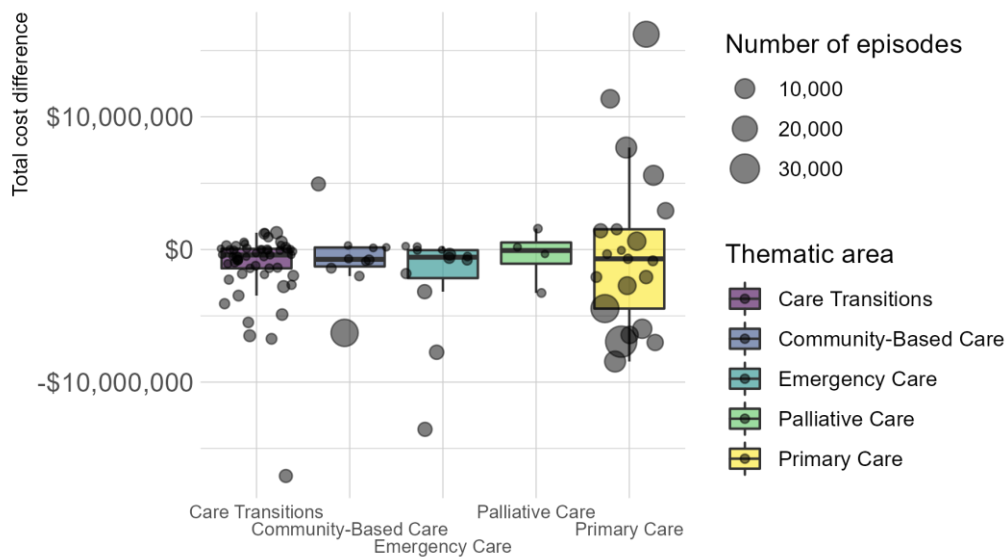
Overall, 33 of the 104 CTIs had lower costs than the performance target and generated savings. CTIs that achieved savings represented nearly one third of implemented CTIs and included all thematic areas (Table 5 **Error! Reference source not found.**). By percentage of CTIs with savings, half of Palliative Care CTIs (2 of 4) had total savings on costs, whereas only 15% of Emergency Care CTIs (2 of 13) achieved savings.

Table 5. Number of CTIs With Cost Savings

Thematic area	Number of CTIs	Number of CTIs with cost savings	Percent of CTIs with cost savings
Care Transitions	55	17	31%
Community-Based Care	10	4	40%
Emergency Care	13	2	15%
Palliative Care	4	2	50%
Primary Care	22	8	36%

Figure 1 shows the range of performance total costs compared with the target total costs for CTIs by thematic areas. Variation by thematic area is driven not only by the difference in per-episode target costs, but also by the wide variation in number of episodes per CTI. For example, Primary Care had the greatest overall total savings and is the thematic area with the widest range in savings, with a range of \$24.6 million in total savings between the CTI with the greatest and the CTI with the smallest savings. This is likely because the Primary Care CTIs had the largest number of episodes, so a CTI with costs differing from target per-episode cost generated a large difference between their total performance costs and the target total costs. In the interviews we conducted, most hospitals reported that the Primary Care CTIs had used existing care delivery improvements that hospitals had implemented as a part of the Maryland Primary Care Program (MDPCP) and thus may have had experience limiting these costs.

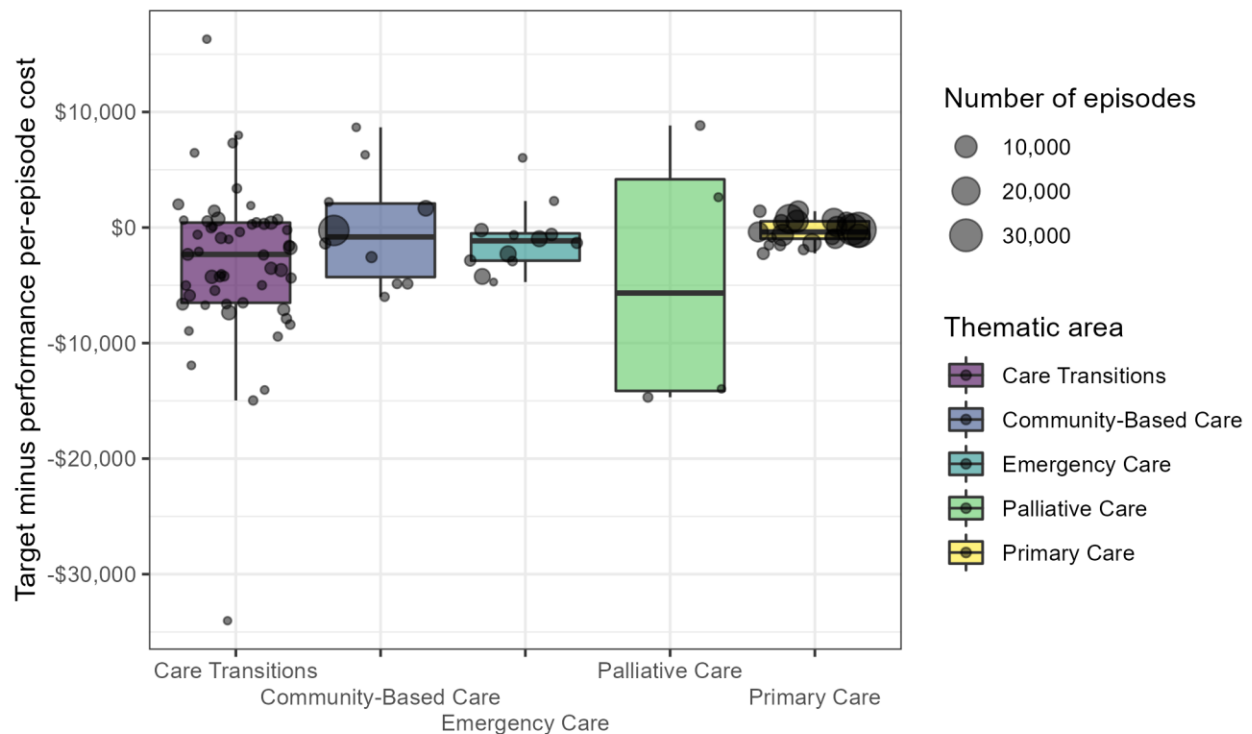
Figure 1. Boxplot of Total Target Costs Minus Total Performance Costs, by Number of Episodes



The difference between average performance per-episode cost and average target per-episode cost varied widely by thematic area. We also analyzed differences between average target and average performance costs per episode (Figure 2). Compared with other thematic areas, Primary Care came closest to target costs, with most Primary Care CTIs having an average per-episode cost within \$2,500 of the average target per-episode cost. Care Transitions had the widest variation, with one CTI more than \$35,000 over the per-episode target cost and another that was more than \$16,000 under the episode target cost. This

variation is likely due to the fact that the Care Transitions CTIs were composed of a variety of different interventions and, according to interview responses, were more likely to involve coordination with external stakeholders, which meant that aspects of the intervention were outside hospital control.

Figure 2. Boxplot of Difference Between Target Per-Episode Cost and Performance Per-Episode Cost, by Number of Episodes



Many CTIs had a low number of total episodes, and the majority of CTIs had fewer episodes during the performance year than in the baseline period (Table 6). The only thematic area that had more episodes, on average, in the performance year than the baseline period was Primary Care. Fewer episodes than the baseline period could indicate less overall health care utilization because of the COVID-19 pandemic or issues with the CTI inclusion criteria. CTIs with a low number of episodes are unlikely to generate significant total cost savings because of limited patient volume; high patient volume is necessary for generating large savings in total costs within each CTI.

Table 6. Difference in Number of Episodes Between Baseline and Performance

Thematic area	Number of CTIs	Median*	Mean
Care Transitions	55	-162.0	-288.8113
Community-Based Care	10	-163.5	-171.7000
Emergency Care	13	-211.0	-612.5833
Palliative Care	4	-161.5	-115.2500
Primary Care	22	215.0	482.5238

*Performance number of episodes minus target number of episodes. Negative values indicate fewer episodes than baseline period.

CTIs with an SDOH focus averaged better performance than CTIs that did not address SDOH. We further analyzed the cost outcomes based on whether a CTI included interventions that focused on SDOH. Overall, our findings indicate that, for certain thematic areas, such as Primary Care and Care Transitions, CTIs with a focus on SDOH generate more total savings compared with those without an SDOH focus (Table 7). For example, within the Primary Care thematic area CTIs that had SDOH-related interventions had average total savings of more than \$514,000, whereas those that did not have SDOH-related interventions averaged nearly \$450k over target total costs. Four of the five thematic areas CTIs that were described as having an SDOH focus had, on average, lower total costs and lower negative savings (losses) than did CTIs without this focus. Additional data from future performance years will need to be analyzed to determine if this pattern is sustained.

Table 7. Total Cost Savings, by SDOH Focus for Each Thematic Area

Thematic area	SDOH focus	Number of CTIs	Average savings in total costs
Care Transitions	Yes	22	-\$559,227
Care Transitions	No	33	-\$1,796,236
Community-Based Care	Yes	1	-\$781,481
Community-Based Care	No	9	-\$640,469
Emergency Care	Yes	7	-\$1,814,524
Emergency Care	No	6	-\$3,107,976
Palliative Care	Yes	1	\$183,672
Palliative Care	No	3	-\$679,406
Primary Care	Yes	9	\$514,014
Primary Care	No	13	-\$449,615

Note. Savings represent the target total costs minus the performance total costs. Positive values indicate that the CTI had overall savings.

The 25 CTIs with the highest savings included all thematic areas and a variety of interventions. In this section, we analyze the CTIs with the highest savings compared with the target costs and discuss the key characteristics of these CTIs. Overall, 33 CTIs had savings during the performance year, as shown in Table 8. These CTIs included all thematic areas, both large and small numbers of episodes, and focus on a variety of patient populations. Additional years of CTI performance data will be required to better analyze whether there are clear CTI characteristics that are likely to yield savings.

The best performing CTIs did not seem to have a pattern of focusing on specific chronic conditions, patient populations, or specific interventions, although we do see that nearly 50% mentioned an SDOH focus.

Table 8. Top 25 CTIs, by Total Savings Over Target Costs

Rank	CTI ID	Thematic area	SDOH focus	Total savings compared with target costs	Per-episode savings compared with target	Episodes complete*
1	03b-004	Primary Care	No	\$16,228,537	\$749	21,665
2	03b-005	Primary Care	Yes	\$11,362,754	\$1,415	8,032
3	03b-009	Primary Care	Yes	\$7,685,677	\$649	11,836
4	03b-006	Primary Care	No	\$5,591,880	\$546	10,244
5	04a-001	Community-Based Care	No	\$4,939,703	\$1,664	2,968
6	03b-010	Primary Care	No	\$2,924,068	\$541	5,405
7	02-016	Palliative Care	No	\$1,571,716	\$8,830	178
8	03b-012	Primary Care	Yes	\$1,523,734	\$1,415	1,077
9	03a-002	Primary Care	Yes	\$1,411,696	\$448	3,151
10	01-059	Care Transitions	No	\$1,267,724	\$745	1,702
11	01-002	Care Transitions	No	\$1,256,694	\$7,306	172
12	01-036	Care Transitions	Yes	\$1,188,735	\$1,436	828
13	01-039	Care Transitions	Yes	\$933,592	\$2,008	465
14	03b-002	Primary Care	No	\$625,424	\$80	7,809
15	01-015	Care Transitions	No	\$575,176	\$424	1,357
16	01-064	Care Transitions	Yes	\$541,078	\$3,382	160
17	01-047	Care Transitions	Yes	\$440,246	\$16,305	27
18	01-066	Care Transitions	No	\$336,129	\$6,464	52

Rank	CTI ID	Thematic area	SDOH focus	Total savings compared with target costs	Per-episode savings compared with target	Episodes complete*
19	04a-005	Community-Based Care	No	\$303,556	\$8,673	35
20	01-046	Care Transitions	Yes	\$287,464	\$544	528
21	01-019	Care Transitions	No	\$262,166	\$697	376
22	05-003	Emergency Care	No	\$247,297	\$6,032	41
23	05-005	Emergency Care	Yes	\$204,361	\$2,296	89
24	02-019	Palliative Care	Yes	\$183,672	\$2,624	70
25	01-014	Care Transitions	Yes	\$175,336	\$319	550

Note. Data as of February 2023.

CTI design and implementation were driven by participating hospitals’

strengths. Although many hospitals used existing initiatives as the basis for their CTI, most organizations were required to take action to modify and implement these activities to align with the CTI program. We surveyed hospital staff regarding their perceptions of the implementation process. The majority (18, 86%), felt that the implementation was positive or somewhat positive, with many respondents citing the fact that these programs were already under development and that this existing experience allowed for smoother implementation of the CTI program. This indicates that, for most hospitals did not view participation in the CTI program as a challenge, and the fact that existing activities qualified as CTIs helped the participants implement the CTIs.

Our survey and interview responses provided helpful insights into the organization and implementation of programs that were most successful:

- Based on survey and interview responses, we found that successful CTIs were developed by hospitals with existing programs that could be implemented as part of the CTI program. These hospitals invested in internal data analysis infrastructure and designed CTIs with broad enough inclusion criteria to guarantee a large number of episodes performed well in the CTI program.
- Some of the key interventions identified in CTI participant interviews for Care Transitions were to assess patients for proper care management processes, including discharge planning, ambulatory, follow-up, and wrap-around services. It was important for all patients to have the appropriate clinical care pathways following their inpatient stay.

- One interviewee whose hospital implemented a Primary Care CTI mentioned a focus on managing panels of patients for cost, quality measures, and patient experience with the support of clinicians. Many of the interviewees mentioned working with physicians that were already part of the MDPCP to reduce avoidable utilization. Additionally, the MDPCP provided organizations with access to additional data to look at external claims data, which helped these hospitals with robust internal assessment procedures to drill down into episode-level data.
- Respondents who described challenges with program design and implementation cited the fact that comprehensive methodology documentation was not available at the time of CTI design. Others mentioned that the lingering effects of the COVID-19 pandemic continued to affect staffing levels and hospital costs, and this made it challenging to implement the program as desired.

Hospitals struggled with a small number of episodes. A frequent challenge reported in interviews and survey responses was fewer than expected episodes being included within each CTI. We identified two potential drivers for this outcome. First, some CTIs were designed with inclusion criteria that were too narrow, resulting in fewer patients than the hospitals expected for the CTI. Hospitals were required to define their inclusion criteria on the basis of a triggering event during the CTI design process. One interviewee noted that this was because claims were not automatically capturing the cases as predicted. Low patient volumes made it difficult for hospitals to generate savings: Hospitals were seeing double-digit cases when they would expect to have triple-digit cases. Many hospitals reported changing their inclusion criteria partway through the year to increase patient volumes. A recurring theme in our interviews among all CTI participants was the difficulty in understanding which patients were being captured in the CTI list whereas others were not.³ Fourteen survey respondents (67%) mentioned challenges in identifying and capturing the intended patient population using data. Interviewees elaborated that patients that they thought were being captured under the CTI criteria were at times passed over.

Another factor that may have limited the number of episodes per CTI is that each patient may only be included in one episode window; if a patient triggers a CTI episode at the same hospital, that individual will be excluded from a second CTI depending on when and where the CTI is triggered.⁴ During interviews, CTI participants indicated that there is limited clarity regarding

³ CRISP has implemented a tool for the second year of the CTI program that allows participants to better estimate enrollment sizes prior to finalizing a CTI.

⁴ CTI episodes that meet two different triggering conditions at the *same hospital & on the same day* will be assigned to only one of the CTI, depending on the hospital's preferences. CTI episodes that meet two different triggering conditions *at the same*

the number of CTI episodes that were dropped because of overlapping CTIs, and therefore the CTI participants were not aware of the impact that this restriction might have had on their overall number of CTI episodes.

When everything is kind of the same in terms of encounter type, window, and patient . . . it's like they might have three visits that in our mind looks like [they] should be on the CTI but [only] one appears to be triggering. -Quality Assurance Manager

Another challenge in patient assignment was in accurately capturing the target population for each CTI. For example, it was not possible to separate elective versus emergency surgery in a CTI. If a hospital planned a CTI around interventions before a patient's planned elective surgery and the patient needed an emergency surgery instead, then the patient would not have received those interventions.

CRISP data could benefit from more clarity and filtering options. An important feature of the CTI program is the data provided by CRISP within the CTP to evaluate the number of episodes and the amount of savings being generated. Feedback from CTI participants indicated that the CRISP portal was helpful, although some participants had limited knowledge on the ability to drill down into patient-level data to determine which particular patient episodes were included in the CTI calculation. The identification of true triggering episodes was difficult for hospitals to assess.

When we identified the definition of a triggering episode . . . we did our own data analysis to characterize the population (the triggering type of care, level of care that they received), and we found some discrepancies not only in the level of care (meaning we found observation visits versus an inpatient stay in our episodes) but also in discharge disposition (meaning that the disposition based on coded data internally identified that the patient would have gone to an SNF [skilled nursing facility] which would have been an exclusion [criterion]). So, validating the episodes

hospital on different days will be assigned to the CTI that occurred first. Any CTI that overlaps between two different hospitals will be allowed, and the CTI will be counted towards both hospital's CTIs. Source: Maryland HSCRC. Care Transformation Steering Committee Meeting, May 21, 2020. Available online at: <https://www.crisphealth.org/wp-content/uploads/2023/03/2021-05-21-May-CT-Steering-Cmte-Materials.pdf>

*with the CRISP team or the HSCRC team was a bit of a challenge for us. -Care
Coordination Manager*

Some respondents also noted that there was limited ability to assess specific drivers of costs and savings within the current data portal, that participants might need more technical assistance in understanding the way to use the available data. Measuring the impact of the CTIs required downloading data from the CRISP portal and conducting analysis using other data sources available to the hospital to assess the effectiveness of its CTI. Because hospitals struggled with connecting to Medicare beneficiary-level data, several interviewees also suggested that CRISP explore ways to make the accessible data more granular. Hospitals with successful CTIs noted that they invested resources in the hospitals' own analytic team to determine whether the strategies were reaching the patient using raw data for the episodes.

Notably, interviewees varied in their opinions on the robustness of CTI data. One interviewee said that the data were not very robust, but another stated that the data and reporting from CRISP were exceptional. The only common theme was a desire to have more filtering options for the data. For example, hospitals expressed an interest in additional criteria for CTI population definitions that could be flagged in the CRISP data system (e.g., dual eligibility, housing, income, self-reported mental health concerns, and other SDOH-related measures).

CTI participants also described their need for more timely data. Several interviewees mentioned that certain elements of CRISP data would change from month to month and that it was hard to determine when data were final. One interviewee mentioned that data from the most recent month would almost always be adjusted after additional months of data were added. Some CTI participants suggest including more transparency regarding how and when data were updated within the CRISP portal. One survey respondent suggested that CRISP include a hospital-led review of identified episodes with excluded discharge dispositions in the first year, a formalized process so that the hospitals could better understand which episodes were excluded and why.

Data lag was a challenge. Many interviewees mentioned that the CRISP CTI portal took longer to update than other similar programs and that the data lag made it hard to quickly modify underperforming CTIs.⁵

⁵ CRISP is limited by the timeliness of data receipt from CMS and that data is currently released on the most expedited possible timeline.

There's an inherent data lag with claims, and that's always an issue. But that's a known, right? To be honest, I don't think I had problems in getting to the raw data for those episodes, it was just that I couldn't measure the impact of my CTI without having to go through all of the steps to download it, characterize it, then analyze it. -Senior Director of Care Coordination

Participating hospitals identified CRISP data as one of the largest areas for potential improvement to help understand each CTI participant's success in the program. Having access to timely data on which patient-level episodes are attributed to their CTI could help hospitals make necessary implementation changes earlier in the program year, allowing for additional cost savings compared with the baseline target.

Research on care transformation supports CTI participants' experience. One study found that the time needed to incorporate and use new data in their project was a major challenge.⁶ Other studies note that data collection is challenging and costly, but it can still be insufficient to identify the interventions that affected certain outcomes.^{7,8} In response to this, some CTI participants developed their own metrics to help their clinical teams better implement the program. A variety of internal assessment measures were mentioned across the interviews: quality scores, quality data utilization, number of admissions, number of readmissions, length of stay, postdischarge follow-up, discharge to skilled nursing facilities versus home, and volume of patients in remote patient monitoring. One CTI participant developed a metric for each step in the CTI: percentage screened for the intervention, percentage screened positive and received the intervention, percentage of patients in the intervention who saw improvement.

COVID-19 continued to impact CTI implementation. Of the surveyed respondents, 13 (62%) mentioned ongoing challenges related to COVID-19. Most of these challenges were directly related to the labor and workforce shortages. Generally, this meant that CTI participants needed to adjust by changing workflows or altering staffing.

⁶ Fairbrother, G., Trudnak, T., Christopher, R., Mansour, M., & Mandel, K. (2014, May). Cincinnati Beacon Community Program highlights challenges and opportunities on the path to care transformation. *Health Affairs (Millwood)*, 33(5), 871–877. <https://doi.org/10.1377/hlthaff.2012.1298> PMID: 24799586

⁷ Johnson, D. C., Kwok, E., Ahn, C., Pashchinskiy, A., Laviana, A. A., Golla, V., Rosenthal, J. T., Bravo, F., Litwin, M. S., & Saigal, C. S. (2019). Financial margins for prostate cancer surgery: Quantifying the impact of modifiable cost inputs in an episode based reimbursement model. *The Journal of Urology*, 202(3), 10–1097. <https://doi.org/10.1097/ju.000000000000283>

⁸ Jayakody, A., Bryant, J., Carey, M., Hobden, B., Dodd, N., & Sanson-Fisher, R. (2016). Effectiveness of interventions utilising telephone follow up in reducing hospital readmission within 30 days for individuals with chronic disease: A systematic review. *BMC Health Services Research*, 16(1), 403. <https://doi.org/10.1186/s12913-016-1650-9>

On our medicine units that see many of these patients, they are still suffering with huge vacancy rates. Our really great education program, which we know demonstrated a decrease in readmission, went to crisis documentation and now no one is documenting the education anymore because they don't have to. And we lost so much staff and had so much temporary replacement staff and none of them knew about the program or really cared about implementing it. -CTI program lead

Several CTI participants also needed to change to account for telemedicine and other postpandemic alterations. For CTIs designed around home health care or remote patient monitoring, CTI participants faced challenges fulfilling staffing and personal protective equipment needs. Because of limited resources, CTIs that could not be adequately redesigned were pulled back when the pandemic hit.

CTI participants praised the responsiveness of CRISP but wanted more support from the HSCRC. Interviewees praised CRISP for its responsiveness to questions and suggestions, and most said that they felt heard and that their complaints and suggestions were taken seriously. However, some interviewees expressed frustration with HSCRC responsiveness to concerns and frequent program changes that contributed to the program's complexity. Interviewees mentioned that HSCRC could support program improvement by providing clearer guidance on program methodology and identifying areas where the CTI program design could be simplified. Many respondents expressed a desire for a similar level of support from HSCRC that hospitals received in other care redesign programs.

CTI participants found the cost methodology to be complex. In responses to both surveys and interviews, CTI participants mentioned the complexity of the cost methodology, with some suggesting that this might have resulted in a lack of clarity on ways to design CTIs that would be most effective. Several survey respondents mentioned the methodology as a potential change for the second year, with specific suggestions of publishing more robust methodology documentation and providing more transparent calculations of each CTI target price and total savings.

Some CTI participants expressed concerns that the cost savings analysis of the CTIs did not fully reflect the effectiveness of the programs. This was at least in part because of the limitations inherent in defining the CTI population on the basis of claims data, a sentiment that was shared by several interviewed CTI participants. The overall complexity of the cost methodology led to a desire for more collaboration across the participating hospitals.

Hospitals supported sharing best practices and engaging in a learning

collaborative. Interviewees unanimously agreed that it would be helpful to connect with other CTI participants on CTI-related topics. There was a particular interest in hearing from the “success stories” in an online forum where hospitals could share which strategies could lead to cost savings. One interviewee emphasized the importance of having a high level of clarity regarding which CTIs were successful and then having the structure for collaboration on sharing the methods. Another interviewee mentioned that, because of COVID, the hospitals lacked the bandwidth to foster collaboration but that this is getting better with time. A recurring theme in the interview responses was the desire to compare patients who were in more than one CTI, whether in a single hospital or across multiple hospitals. This would shed some light on the impact of different CTIs and help determine whether greater coordination might be possible.

Considerations for Updating the CTI Cost Methodology

As part of the first-year CTI evaluation, CRISP requested that AIR review and offer suggestions regarding the CTI cost methodology. We reviewed Version 14 of the [Care Transformation Initiative User’s Guide](#), the [Care Transformation Initiative Frequently Asked Questions \(FAQ\)](#), and other payment methodologies developed by CMS and provided feedback about five aspects of the methodology. We note that CTI policies have continued to evolve since the beginning of the CTI program, and at the time this report was written, HSCRC was in the process of updating the cost methodology. Therefore, some of the recommendations below may already be addressed in the revised cost methodology.

1. **Baseline Period.** HSCRC indicated that baseline periods could be no earlier than 2016.⁹ Other Bundled Payments for Care Improvement Initiative models¹⁰ use 3-year baseline periods because this makes them less susceptible to short-term variations caused by either unusual fluctuations in costs or unusual complex cases and therefore better able to reflect hospital long-term cost trends. HSCRC could consider increasing the length of baseline periods used as comparisons for performance costs.
2. **Update Factors.** According to the CTI methodology, costs for each setting of care (regulated, physician, inpatient rehab, SNF, home health, and other) are inflated separately using a setting-specific update factor. These update factors can be achieved by constructing

⁹ Maryland Health Services Cost Review Commission. Care Transformation Initiative Frequently Asked Questions. (n.d.) https://hscrc.maryland.gov/Documents/Care%20Redesign/Steering%20Committee/Care%20Transformation%20Initiative%20FAQs_final.pdf

¹⁰ CMMI. Bundled Payments for Care Improvement Initiative (BPCI) Background on Model 3 for Prospective Participants. February 2014. https://innovation.cms.gov/files/x/bpci_model3background.pdf

reference episodes belonging to similar non-CTI hospitals and calculating the growth rate of their expenditures over time.

3. **Quality Performance Metrics.** As noted in the preimplementation report, the distribution of CTI savings is not conditional on hospitals' meeting any quality performance metrics. This decision was made early in the CTI program to reduce administrative burden on hospitals and also because variation in the design of CTIs meant that valid and reliable quality measures might not be available for the selected patient population. However, metric performance thresholds can incentivize the provision of appropriate care for patients. Therefore, HSCRC could consider requiring hospitals to select a limited number of quality metrics that could be calculated on both the baseline period and the performance year. As the program evolves, HSCRC could also consider adjusting reconciliation payments on the basis of hospitals' performance on quality metrics.
4. **Overlapping CTIs.** According to the CTI methodology, a single beneficiary could meet the triggering event for two different CTIs. We suggest that HSCRC consider excluding the second triggering event in cases in which beneficiaries are affected by multiple CTIs because the way to attribute savings in such cases is not clear.

Updates That CTI participants Suggested to the CTI Program for Year 2

Surveyed CTI participants suggested several program improvements for future years of the CTI program. The most frequent suggestion was to improve CRISP data tools to reduce data lag and allow for a more comprehensive analysis of episode-level data. Although some of this data may be available via existing sources hospitals are struggling to link relevant data elements. Other suggestions from survey responses and interviews include the following:

- Access to a more a comprehensive projection of CTI volume/cost that would account for overlapping CTIs, panel-based performance, inflation, and patients who were included in multiple CTIs in different hospitals.
- Robust documentation to help CTI participants determine whether shifts in costs were due to interventions or other factors in the health services environment.
- Changing the methodology to allow for cost comparisons with a concurrent cohort of patients (as opposed to historical comparisons) using hierarchical condition category scores or other risk factors.
- Increased flexibility for definitions and triggers to account for differences between payment models in the baseline year and those in the current performance year.

Conclusion

This evaluation analyzed the first performance year of the CTI program, using data available in February of 2023, by comparing total performance costs with baseline costs for CTIs and by evaluating interview and survey responses to identify key lessons learned and areas for improvement in future program years. Our analysis shows that some participating hospitals designed CTIs that saved money in the first performance year of the program and, with a sufficient number of episodes, had the potential to generate overall savings. Additional performance years will allow for a more robust assessment of the ways in which different CTI designs compare along the lines of thematic area, episode length, inclusion of index hospital stay, and focus on certain patient populations. As noted in the report, our analysis did not include finalized data and should not be considered equivalent to final cost calculations conducted by HSCRC.

Several key successes and challenges emerged during our evaluation and provided important considerations for future program success.

Hospitals are committed to quality improvement and motivated by the CTI financial incentives but require ongoing technical assistance with designing episodes and understanding the methodology. The majority of survey and interview respondents expressed commitment to care redesign activities and said that the CTI program aligned with their organization's goals and values. The CTI program gives these hospitals the opportunity to be rewarded for this work, and the flexibility of the program lets hospitals tailor the interventions to their organizations strengths and limit the costs required to develop and implement the program. However, hospitals also struggled to design episodes effectively and understand how they would function under the cost methodology. Ongoing technical assistance (TA) in this area may be important for sustaining hospitals' willingness to participate in the future.

CTIs with a large number of episodes and performance costs below target are necessary for generating significant savings. Savings within the CTI program are driven by the inclusion criteria designed by each hospital's CTI. CTIs with narrow inclusion criteria risk underperforming because of lack of episodes attributed to the program. CRISP could help hospitals design CTIs that save costs on a per-episode basis by providing technical assistance to CTI participants and increase the number of episodes that could qualify. Data should be provided to hospitals on the number of episodes removed because of duplicate or overlapping CTIs, because this could result in fewer episodes than anticipated.

Hospitals are seeking up-to-date, detailed data to analyze program

effectiveness. Nearly all hospitals identified data access as a significant program challenge.

Both data lag and lack of robust patient-level data were key barriers that prevented participants from analyzing their CTI's progress and developing internal metrics to track performance. CRISP should explore ways to expand the data available through the CTP portal for future program years in consultation with participating hospitals.

CTI participants would like CRISP to facilitate more hospital collaboration to

share best practices. Hospitals are seeking to learn more about specific interventions that have been successful within the CTI program. All interviewed hospitals expressed a willingness to participate in the learning collaborative to share best practices. CRISP could also consider developing case studies that analyze successful CTIs at the intervention level to gain a better understanding of CTI features that may be driving savings and that can be implemented within other Maryland hospitals. CRISP could also consider providing additional technical assistance to help hospitals understand the way their CTI target prices and included episodes align with the program methodology.

This evaluation provides a starting point for assessing the first performance year of the CTI program by highlighting key characteristics of CTIs that were found to save costs of care, providing insight into the successes and challenges faced by hospitals implementing the program, and suggesting actionable areas for program improvement in future years. The completion of additional performance years will allow for further insights into the characteristics of successful CTIs and potential cost-saving interventions that have the opportunity for statewide implementation.

Appendix A.

Background on the CTI Program

This section is an excerpt from the preimplementation report, which provides descriptive statistics on the originally proposed CTIs and results from a preimplementation survey of participants, along with analysis of discussions conducted with CRISP and HSCRC.

Overview of CTIs: Thematic Areas, Episodes, and Baseline Costs

CTIs are grouped into thematic areas on the basis of similarities in the clinical interventions used, the settings in which the triggering event occurs (such as a hospital or a primary care practice), and the way in which the patient populations are defined (e.g., by diagnosis or by the treating provider).¹¹ When developing the CTI program, HSCRC did not initially define the areas that hospitals should focus on in the CTI program but instead asked hospitals to propose CTIs that aligned with areas that they considered high priorities. As hospitals submitted CTIs for approval, HSCRC and its CTI Steering Committee finalized five thematic areas:

- **Care Transitions**, which focus on transitional care management such as discharge coordination, home assessments, and telehealth transition services
- **Community-Based Care**, which targets the broader community, including community health workers, providers assigned to senior living buildings, or care coordinators for patients transitioning to or from skilled nursing facilities (SNFs)
- **Emergency Care**, which focuses on reducing ED visits for patients who are at high risk for ED use (such as high utilizers and individuals who have unmet social needs)
- **Palliative Care**, which focuses on managing direct care of chronic pain patients; improving advanced care planning; and coordinating with home health, hospice, and SNF
- **Primary Care**, which is for hospitals that have programs to improve their primary care services, such as wrap-around services; completion of social, behavioral, and home safety assessments; and referrals to community resources

¹¹ We note that this document was created by HSCRC at the beginning of the CTI program and contains information that is now out of date. A detailed methodology was being updated at the time of this report, and a revised document will be published by HSCRC. Maryland Health Services Cost Review Commission. (n.d.). *Care Transformation Initiative frequently asked questions*. https://hscrc.maryland.gov/Documents/Care%20Redesign/Steering%20Committee/Care%20Transformation%20Initiative%20FAQs_final.pdf

This evaluation includes the 105¹² CTIs that were approved and that had complete data available at the time of our analysis. These CTIs cover 233,228 Medicare fee-for-service beneficiaries in Maryland, which is nearly a quarter of the 1 million beneficiaries who have Medicare Parts A and B coverage in any given month. Nearly 75% of first-year CTIs are in Care Transitions or Primary Care (Table A1).

Table A1. Number of CTIs, by Thematic Area

Thematic area	Number of CTIs	Total number of patients at baseline
Care Transitions	55	35,612
Community-Based Care	10	29,985
Emergency Care	13	17,314
Palliative Care	6	986
Primary Care	21	149,331
Total	105	233,228

To construct a CTI, hospitals identify a patient population (for example, patients with chronic conditions being discharged from an acute care stay) and episode length, or the duration of time during which the patients will receive a set of interventions (Table A2). Hospitals are responsible for all costs during the episode. Episodes lasting 90 days are most common; however, 365-day episodes account for nearly a quarter of CTIs and are concentrated in the Primary Care thematic area. We note that HSCRC requires certain episodes (e.g., those that follow a panel of patients) to be 365 days and hospitals cannot change the length.

Table A2. CTI Episode Length, by Thematic Area

Thematic area	30 days	60 days	90 days	180 days	365 days
Care Transitions	6	10	29	8	2
Community-Based Care	1	2	5	0	2
Emergency Care	2	1	9	1	0
Palliative Care	0	0	3	1	2
Primary Care	0	0	1	1	19
Total	9	13	47	11	25

¹² CRISP assigns a numeric identifier for each unique CTI; the identifier corresponds to a defined set of interventions, an episode length, and criteria for selecting the patient population. There are 92 unique CTIs. However, the same CTI may be conducted by more than one hospital. In these cases, CTI definition is the same but each hospital has different baseline costs and will be evaluated individually for cost savings. Of the 92 unique CTIs, eight are being conducted at more than one hospital, and we treat each of these as a unique CTI.

Hospitals select a 1-year period that serves as a baseline. Claims data from this baseline period are used to calculate a target price for the episode. After the performance year ends, costs will be compared with the target price to determine whether the CTI achieved savings. Because some hospitals had been engaged in care transformation efforts prior to the start of the CTI program, they could select a baseline period that predated those efforts so that the baseline did not include the period when interventions were being implemented.¹³ CTIs vary widely in the number of episodes available in baseline data (Table A3). This variation reflects differences in patient populations and length of episodes.

Table A3. Number of Baseline Episodes per CTI, by Thematic Area

Thematic area	Mean	Minimum	Maximum
Care Transitions	713	15	2,907
Community-Based Care	3,050	29	22,556
Emergency Care	1,624	13	5,531
Palliative Care	168	1*	342
Primary Care	7,262	82	32,525

Note. Baseline episode data are masked when there are fewer than 12 episodes.

The target price per episode depends on the number of available baseline episodes, the variation in costs for these episodes, patient complexity and care needs, and the types of costs that hospitals choose to include in the episode. For example, some CTIs may be triggered by an inpatient hospital stay, although others may not. For episodes that are triggered by an inpatient hospital stay, hospitals can choose to include or exclude the cost of that stay in the CTI episode. Eighty-eight CTIs included the index hospitalization in the cost of the episode, and most were Care Transitions or Primary care CTIs. Palliative Care CTIs have the highest costs per episode, likely because of the severity of illness in the patient population (Table A4).

Table A4. Preliminary Target Price, by Thematic Area

Thematic Area	Minimum	Mean	Median	Maximum
Care Transitions	\$9,048	\$34,438	\$34,805	\$87,369
Community-Based Care	\$12,027	\$27,378	\$29,092	\$43,831
Emergency Care	\$8,203	\$14,552	\$11,165	\$29,871
Palliative Care	\$34,417	\$48,808	\$42,287	\$88,197
Primary Care	\$3,952	\$14,562	\$13,502	\$35,182

¹³ The earliest available baseline data were those from 2016. Almost half (48) of CTIs are using baseline data that are recent (2018 or later), but the remainder rely on 2016–2017 data.

Nearly all Maryland hospitals are participating in the CTI program, and most are motivated by the potential to earn savings.

Forty-three hospitals (or 90% of Maryland hospitals) led CTIs during the 2021–2022 performance period. We surveyed CTI participants to understand why they were participating in the CTI program and why they chose the clinical areas they did. Reasons for participation varied among the 21 survey respondents: the majority (12) were participating in CTIs to earn potential savings or because they were already engaged in similar initiatives and were eager to be formally evaluated. Six other respondents said that they were conducting CTIs because they wanted to avoid financial penalties or because there was no downside financial risk if they did not achieve savings.

We also asked participants whether they designed CTIs to address clinical areas or patient populations that represented elevated areas of spending. The survey results were divided: 11 respondents said that their CTIs were intended to address an area of high spending, but another 10 said that this was not the purpose of their CTI. As noted by several interviewees, hospitals might be more focused on designing CTIs that improved quality and patient outcomes than on addressing costs. Other respondents indicated that the CTI program offered an opportunity to align quality with financial incentives, improve patient outcomes, or establish better relationships with communities and other providers.

These responses align with the findings from our interview with HSCRC. During the planning phase of the CTI program, HSCRC conducted outreach to hospitals to understand the types of transformation projects they were already engaged in. Hospitals, although indicating a need to understand whether those projects were working to reduce costs, often lacked the internal data support to evaluate the projects. The CTI program helps to fill that gap.

Appendix B.

Interview Questions

1. Could you describe your role in implementing the Care Transformation Initiative at [Hospital Name/Health System]?
2. Based on the information we have from HSCRC, [HOSPITAL NAME/HEALTH SYSTEM] implemented [NUMBER OF CTIs] in 2021-2022: [STATE NAMES OF CTIs]. Could you briefly summarize this/these CTI(s)
 - a. Was this a new initiative or something your health system had already been doing?
 - i. [IF THE INITIATIVE(S) WAS/WERE NOT NEW]: Why did you choose an existing intervention as opposed to designing a new episode and interventions?
 - b. Could you please describe the interventions for this/these CTI(s)?
 - c. Could you please describe how you implemented this/these CTI(s)? For example, did you develop new workflows, new care teams, screening tools, etc.? To what extent did you invest new resources in this/these CTI(s) (e.g., new FTEs)
 - d. What metrics did you use to measure success or changes resulting from your CTI(s)?
3. Why did [HOSPITAL NAME/HEALTH SYSTEM] select this area for the first year of the CTI program?
4. Although the cost calculations for the CTIs will not be finalized until next year, do you have a sense of whether your CTI has had an impact on cost of care?
 - a. Were there specific cost-drivers your CTI was targeting?
 - b. Are there other cost drivers that are significant for your hospital that a CTI was not able to address?
5. Were you able to implement the CTI as you intended? What went well?
6. What were the challenges of implementing your CTI(s)? (e.g., how the CTI program is designed, constructing an episode, implementing interventions)?
7. [FOR HOSPITALS/HEALTH SYSTEMS THAT CHANGED THEIR CTI OR ARE STARTING A NEW ONE]: We understand that you are changing your CTI for year 2. Could you please explain what motivated these changes?

8. Did you feel you had adequate support from CRISP and HSCRC to implement the CTI? What other supports would be helpful going forward?
9. Would it be helpful to you to connect with other hospitals on CTI-related topics? If yes, what topics?
10. Do you have any specific feedback related to the cost methodology?
11. Do you have any other feedback on the CTI program either over the first year or looking ahead to year 2?

Appendix C.

Survey Questions

1. Briefly explain why your hospital decided to implement a CTI. (FREE TEXT)
2. Was your CTI's focus a major cost driver at your hospital system/hospital? (YES/NO)
3. How would you characterize the implementation of your CTI over the past year?
 - *Mostly positive*
 - *Somewhat positive*
 - *Somewhat negative*
 - *Mostly negative*
4. Please briefly explain your answer. (FREE TEXT)
5. What, if any, challenges did you experience when implementing the CTI?
 - *Identifying/capturing the intended patient population using data*
 - *Implementing interventions as intended*
 - *Team communication*
 - *Challenges with external partners*
 - *Challenges with internal partners*
 - *Labor/workforce shortages*
 - *Lack of support from administration*
 - *Patients' health risk profile/morbidity*
 - *Ongoing challenges related to COVID-19*
 - *Other (PLEASE SPECIFY)*
 - *No challenges*
6. How did you address these challenges? (FREE TEXT)
7. What were some of the successes that resulted from implementing the CTI? (FREE TEXT)

8. Did your CTI focus on racial/ethnic minorities and/or low-income populations?
(YES/NO/DON'T KNOW)
 - a. Please explain how your interventions were implemented in order to meet the needs of these populations. (FREE TEXT)
9. Did your hospital make infrastructure changes over the past year to support implementation of your CTI? For example, hiring additional staff, investing in new IT systems, or forming partnerships with other organizations? (YES/NO/DON'T KNOW)
 - a. Please explain these changes. (FREE TEXT)
10. Did your team make any adjustments to the CTI design (such as the triggering event, population of interest, or interventions) during the first year? (YES/NO/DON'T KNOW)
 - a. What were those specific changes, and why were they needed? (FREE TEXT)
11. Have you received any feedback from your staff, patients, partners, and other stakeholders about the CTI this year? (YES/NO/DON'T KNOW)
 - a. Was this feedback mainly positive or negative? (POSITIVE/NEGATIVE/MIXED)
12. What changes, if any, would you like to see in the CTI program in the coming year?
(FREE TEXT)

Appendix D.

Complete List of Year 1 CTIs

CTI ID	Thematic area	Total savings compared with target costs	Per-episode savings compared with target	Episodes complete
03b-004	Primary Care	\$16,228,537	\$749	21,665
03b-005	Primary Care	\$11,362,754	\$1,415	8,032
03b-009	Primary Care	\$7,685,677	\$649	11,836
03b-006	Primary Care	\$5,591,880	\$546	10,244
04a-001	Community-Based Care	\$4,939,703	\$1,664	2,968
03b-010	Primary Care	\$2,924,068	\$541	5,405
02-016	Palliative Care	\$1,571,716	\$8,830	178
03b-012	Primary Care	\$1,523,734	\$1,415	1,077
03a-002	Primary Care	\$1,411,696	\$448	3,151
01-059	Care Transitions	\$1,267,724	\$745	1,702
01-002	Care Transitions	\$1,256,694	\$7,306	172
01-036	Care Transitions	\$1,188,735	\$1,436	828
01-039	Care Transitions	\$933,592	\$2,008	465
03b-002	Primary Care	\$625,424	\$80	7,809
01-015	Care Transitions	\$575,176	\$424	1,357
01-064	Care Transitions	\$541,078	\$3,382	160
01-047	Care Transitions	\$440,246	\$16,305	27
01-066	Care Transitions	\$336,129	\$6,464	52
04a-005	Community-Based Care	\$303,556	\$8,673	35
01-046	Care Transitions	\$287,464	\$544	528
01-019	Care Transitions	\$262,166	\$697	376
05-003	Emergency Care	\$247,297	\$6,032	41
05-005	Emergency Care	\$204,361	\$2,296	89
02-019	Palliative Care	\$183,672	\$2,624	70
01-014	Care Transitions	\$175,336	\$319	550

CTI ID	Thematic area	Total savings compared with target costs	Per-episode savings compared with target	Episodes complete
04b-003	Community-Based Care	\$163,671	\$6,295	26
04a-008	Community-Based Care	\$121,934	\$2,217	55
01-008	Care Transitions	\$82,942	\$439	189
01-042	Care Transitions	\$63,929	\$7,991	8
01-054	Care Transitions	\$48,498	\$272	178
01-067	Care Transitions	\$28,510	\$1,901	15
01-055	Care Transitions	\$20,450	\$639	32
01-003	Care Transitions	\$3,468	\$71	49
01-065	Care Transitions	\$(7,128)	\$(23)	306
01-069	Care Transitions	\$(27,412)	\$(216)	127
05-008	Emergency Care	\$(28,299)	\$(4,716)	6
01-030	Care Transitions	\$(40,838)	\$(1,021)	40
05-006	Emergency Care	\$(52,976)	\$(654)	81
01-039	Care Transitions	\$(54,260)	\$(385)	141
01-063	Care Transitions	\$(57,039)	\$(613)	93
03a-003	Primary Care	\$(66,342)	\$(873)	76
01-070	Care Transitions	\$(143,366)	\$(2,078)	69
01-038	Care Transitions	\$(268,892)	\$(6,722)	40
02-015	Palliative Care	\$(335,020)	\$(13,959)	24
03b-009	Primary care	\$(347,380)	\$(1,524)	228
05-012	Emergency Care	\$(362,625)	\$(224)	1,617
01-066	Care Transitions	\$(384,937)	\$(8,952)	43
01-033	Care Transitions	\$(405,564)	\$(11,928)	34
01-048	Care Transitions	\$(414,767)	\$(4,027)	103
05-010	Emergency Care	\$(528,205)	\$(2,902)	182
01-037	Care Transitions	\$(534,171)	\$(14,057)	38
01-001	Care Transitions	\$(544,256)	\$(4,993)	109
01-053	Care Transitions	\$(544,449)	\$(34,028)	16
01-004	Care Transitions	\$(561,681)	\$(900)	624

CTI ID	Thematic area	Total savings compared with target costs	Per-episode savings compared with target	Episodes complete
05-008	Emergency Care	\$(631,711)	\$(602)	1,049
04a-006	Community-Based Care	\$(701,826)	\$(5,999)	117
03b-009	Primary Care	\$(702,290)	\$(1,903)	369
01-018	Care Transitions	\$(769,495)	\$(2,375)	324
01-073	Care Transitions	\$(772,676)	\$(5,017)	154
04a-002	Community-Based Care	\$(781,481)	\$(1,373)	569
05-014	Emergency Care	\$(794,338)	\$(1,328)	598
01-031	Care Transitions	\$(802,409)	\$(1,576)	509
03b-009	Primary Care	\$(852,658)	\$(1,525)	559
04a-003	Community-Based Care	\$(895,510)	\$(4,867)	184
01-048	Care Transitions	\$(979,772)	\$(4,205)	233
01-027	Care Transitions	\$(1,075,326)	\$(9,433)	114
01-013	Care Transitions	\$(1,220,645)	\$(5,449)	224
01-056	Care Transitions	\$(1,370,864)	\$(4,366)	314
04a-004	Community-Based Care	\$(1,408,283)	\$(2,561)	550
01-058	Care Transitions	\$(1,409,901)	\$(6,619)	213
01-045	Care Transitions	\$(1,418,973)	\$(8,396)	169
05-002	Emergency Care	\$(1,815,289)	\$(2,854)	636
01-041	Care Transitions	\$(1,831,766)	\$(4,250)	431
01-062	Care Transitions	\$(1,885,530)	\$(14,965)	126
01-020	Care Transitions	\$(1,973,986)	\$(2,325)	849
04a-007	Community-Based Care	\$(2,003,677)	\$(4,863)	412
03b-010	Primary Care	\$(2,075,652)	\$(2,244)	925
03b-007	Primary Care	\$(2,078,492)	\$(841)	2,471
01-043	Care Transitions	\$(2,272,250)	\$(6,511)	349
01-060	Care Transitions	\$(2,663,059)	\$(7,879)	338
03a-001	Primary Care	\$(2,726,520)	\$(380)	7,174

CTI ID	Thematic area	Total savings compared with target costs	Per-episode savings compared with target	Episodes complete
01-015	Care Transitions	\$(2,796,173)	\$(1,757)	1,591
05-010	Emergency Care	\$(3,178,967)	\$(972)	3,271
02-018	Palliative Care	\$(3,274,915)	\$(14,686)	223
01-035	Care Transitions	\$(3,476,033)	\$(3,525)	986
01-017	Care Transitions	\$(4,086,523)	\$(5,880)	695
03b-014	Primary Care	\$(4,453,864)	\$(167)	26,729
01-032	Care Transitions	\$(4,904,544)	\$(3,682)	1,332
01-026	Care Transitions	\$(5,494,637)	\$(6,628)	829
03b-013	Primary Care	\$(5,976,502)	\$(653)	9,150
04b-001	Community-Based Care	\$(6,283,791)	\$(252)	24,970
03b-010	Primary Care	\$(6,438,809)	\$(970)	6,639
01-009	Care Transitions	\$(6,499,474)	\$(4,265)	1,524
01-052	Care Transitions	\$(6,732,693)	\$(7,102)	948
03b-003	Primary Care	\$(6,949,111)	\$(195)	35,642
03b-008	Primary Care	\$(7,010,531)	\$(1,320)	5,313
05-001	Emergency Care	\$(7,744,509)	\$(2,282)	3,393
03b-009	Primary Care	\$(8,444,878)	\$(708)	11,929
05-004	Emergency Care	\$(13,556,289)	\$(4,234)	3,202
01-061	Care Transitions	\$(17,072,966)	\$(7,356)	2,321

Note: Data current as of February 2023.

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