



# EVALUATING THE INTEGRATED COMMUNITY CARE MANAGEMENT (ICCM) LEARNING COLLABORATIVE

Vermont's Outcomes & Lessons Learned

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# Executive Summary

## Background

The Vermont Integrated Community Care Management (ICCM) Learning Collaborative was a regional, rapid-cycle quality improvement initiative focused on individuals with complex health and psychosocial needs. Its goals included reducing fragmentation of care; improving access to timely, appropriate, and high-quality care; engaging individuals more fully in their own care; improving communications between providers in multiple organizations for more coordinated care; and lowering the utilization of unnecessary care. The approach involved developing multi-disciplinary care teams and using common care management tools, patient-driven care plans, and a single lead care coordinator for each participant. The initiative was supported through the Vermont State Innovation Model (SIM) grant and facilitated by staff of the Department of Vermont Health Access (including the Blueprint for Health and Payment Reform), the Green Mountain Care Board, and the Vermont Program for Quality in Health Care.

In the first year, three hospital service area communities participated. By the second year, participation expanded to include all but two of Vermont's hospital service areas' local communities. While each community developed their own recruitment criteria to identify individuals with complex health and psychosocial conditions, all communities received training in and access to care coordination tools such as "Domain Cards,"<sup>1</sup> root cause analysis, eco-mapping, and strategies to develop a shared care plan and identify a lead care coordinator. The Learning Collaborative's funding ended with the conclusion of the SIM grant in mid-2017; however, OneCare Vermont (Vermont's Accountable Care Organization) continued with the ICCM's approach and tools as part of its care model for identifying and supporting its attributed members. Additional details on the Learning Collaborative are available in the 2017 evaluation report by the Vermont Program for Quality in Health Care.<sup>2</sup>

## Research Objective

The following analysis used all-payer claims data to track trends in total expenditures for health care, subcategories of expenditures, and patterns of utilization to assess whether the ICCM impacted the ways in which socially and medically complex Vermonters used the health care system.

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<sup>1</sup> The Camden Coalition of Healthcare Providers (Camden, New Jersey) developed a set of cards based on 14 identified domains that contribute to social and medical complexity. Using these cards to guide the conversation, caregivers and patients prioritize the domains to be addressed. For example, patients identify which domains they "need to work on right now," which they "need to work on later," and which they "do not need to work on." For more detail, see "Care Planning for Patients with Frequent Hospitalizations Toolkit" (February 2016), Page 24: [https://camdenhealth.org/wp-content/uploads/2016/12/Care-Planning-Toolkit\\_final.pdf](https://camdenhealth.org/wp-content/uploads/2016/12/Care-Planning-Toolkit_final.pdf).

<sup>2</sup> Vermont Program for Quality in Health Care, Integrated Community Care Management Learning Collaborative: Final Evaluation Report, 2017. Available at: <https://www.vpqhc.org/iccm-learning-collaborative>

## Summary of Findings

Findings suggest that the population participating in the ICCM Learning Collaborative did not show a decrease in overall health care expenditures. However, the findings do indicate a shift in patterns of care for the ICCM group away from emergency care and towards care management and services that address socioeconomic needs. Specifically, the ICCM group had a greater decrease in emergency department (ED) visits and expenditures and a greater increase in expenditures for home- and community-based services relative to the matched Comparison group. However, only the differences in ED utilization and expenditures, both over time and between groups, were statistically significant.

Other outcomes (e.g., expenditures), while not statistically significant, signal trends that warrant further investigation to understand more fully changes in care patterns. Such future studies should address some of the limitations of this study. For example, this study did not investigate the characteristics and diagnoses of those in the highest expenditure group (i.e., the \$100,000+ category) relative to the other expenditure categories (Figure 2). Such an analysis might provide insight into why the expenditures for members in this highest-expenditure category persisted, while the expenditures for members in the lower expenditure categories appeared to decrease over time. Also, the 12-month post period may not have been sufficiently long for effects of the ICCM intervention to become apparent. Additionally, the persistently higher expenditures for the ICCM group could indicate the limits of using only claims data to identify a matched comparison group. Given the psychosocial and health complexities of the ICCM group, claims may not fully capture all relevant characteristics such as social determinants of health and severity of conditions that, if included, would identify a better matched comparison group. Therefore, future analyses should consider integrating other data sources.

## Acknowledgements

The authors would like to acknowledge the valuable contributions made to this study by Katie Muir at OneCare Vermont and Erin Flynn at Payment Reform, Department of Vermont Health Access. Both contributed to improving the analytics and providing necessary background information about the Learning Collaborative.

# Full Report: Evaluating the Integrated Community Care Management (ICCM) Learning Collaborative

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## Research Objective

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## Methodology

### Study Design

The study used a retrospective, longitudinal design that analyzed claims data from patients in the intervention group (i.e., those in the ICCM) that were incurred during the year in which the patient joined the ICCM (“anchor year”), the previous year (“pre-year”) and the following year (“post-year”). These results were compared to a matched comparison group over the same period using a difference-in-differences approach.

### Population

The ICCM had 308 participating patients. These patients were identified in Vermont’s all-payer claims database, the Vermont Health Care Uniform Reporting & Evaluation System (VHCURES) and had a 95% linkage rate to patient roster data provided by the Learning Collaborative participants from the participating communities. The analysis included the following exclusions for the study cohort:

- Individuals who died during the period of analysis (since end-of-life care typically entails disproportionate health care spending)
- Individuals with only one year of data (since they could not be followed across the three years of interest)
- Individuals who joined the ICCM in 2017 (since 2018 was the year in which OneCare Vermont began full implementation of its care model, making it impossible to differentiate the impact of the ICCM from the subsequent care model intervention)

After these exclusions, the final analysis included 209 individuals for the ICCM group. The members of the final ICCM group were matched to a comparison group based on a propensity score. We were able to follow more than 96% of individuals in both the ICCM and the Comparison groups across the pre-year, the anchor year (when members joined the ICCM), and the post-year.

## Results

### Population Characteristics

The ICCM and Comparison groups were very similar in terms of age, sex, payer, selected chronic conditions, mental health conditions, overall health status as identified by 3M Clinical Risk Groups, emergency department (ED) use, and annual health care expenditures. Table 1 shows the proportions of selected characteristics for the two groups, none of which were significantly different. Table 1 also shows that both groups had high rates of comorbidities.

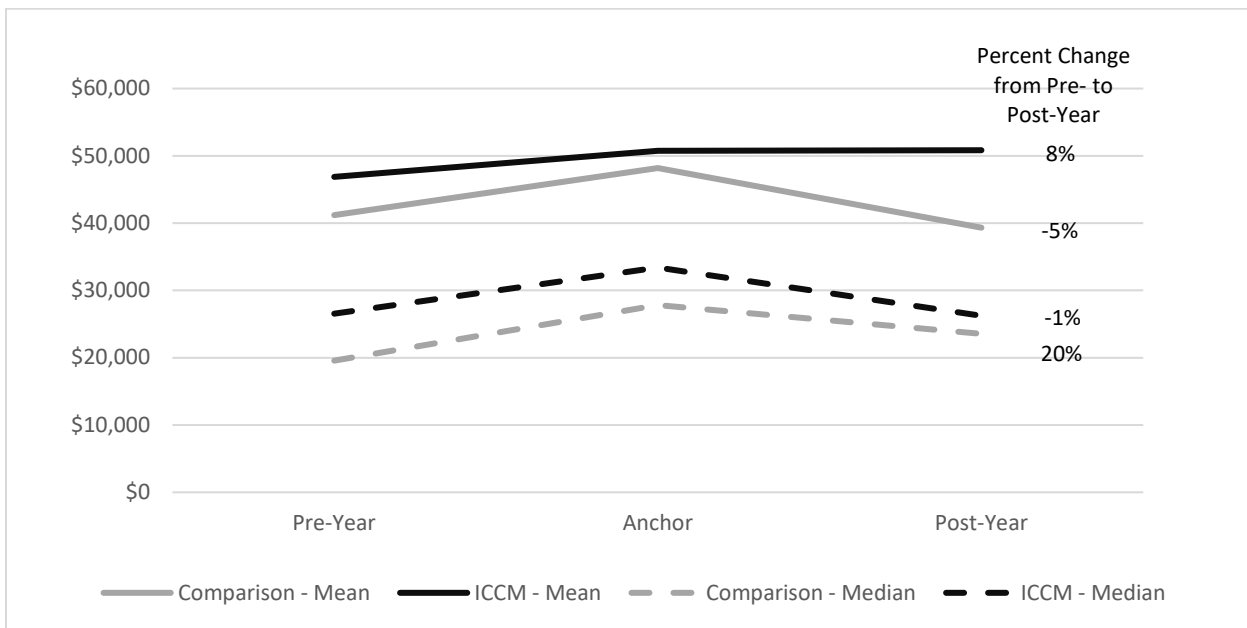
**Table 1.** Characteristics of the ICCM & Comparison Groups

Metric/Characteristic	Comparison	ICCM
N	209	209
Medicare	62%	62%
Dual Eligible	48%	48%
Average Age (Years)	55	54
Ischemic Heart Disease	26%	23%
Congestive Heart Failure	11%	13%
COPD	27%	27%
Diabetes	47%	42%
Hypertension	57%	58%
Mental Health	85%	81%
Depression	66%	62%
Substance Use Disorder	26%	30%

## Expenditures

Despite the similarity in many characteristics, the ICCM group had consistently higher annual expenditures than the Comparison group. In the anchor year, the ICCM group had annual mean expenditures of \$50,738 and annual median expenditures of \$33,402. The Comparison group had annual mean expenditures of \$48,189 and annual median expenditures of \$27,823. The difference between the mean and median indicate that both groups had subgroups of high-cost patients that disproportionately impacted the mean. Figure 1 shows the trends of the means and medians over time for the two groups.

**Figure 1.** ICCM & Comparison Groups' Trends for Total Cost of Care, Mean & Median, Including Outliers (Pre, Anchor, & Post)



While both groups had similar increases in average expenditures from the pre-year to the anchor year, the ICCM group's mean remained high while the Comparison group's mean declined in the post-year. For the median expenditures, both groups had a decline from the anchor year to post year, but the

ICCM returned to expenditures similar to the pre-year while the Comparison had a 20% increase from its pre-year. These trends indicate that several high-cost individuals in the ICCM group had persistently high costs not reduced by the intervention, a finding that is supported by the distribution of annual expenditures.

**Figure 2. ICCM & Comparison Groups’ Distribution of Annual Expenditures (Pre, Anchor, & Post)**

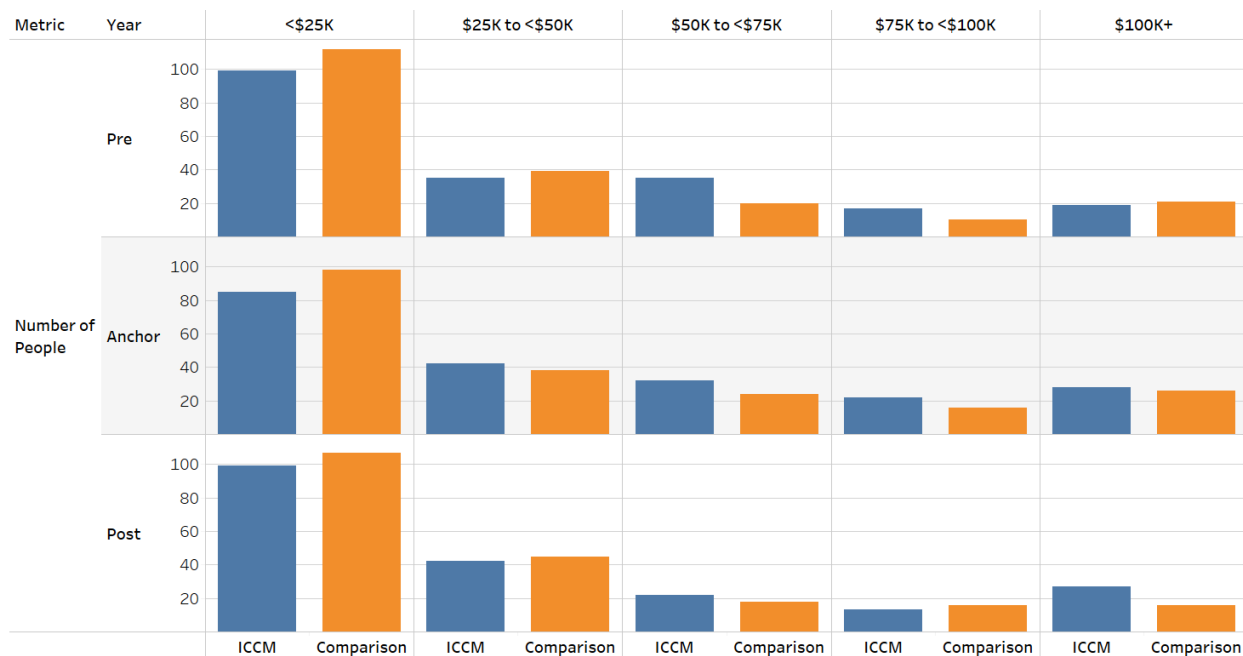


Figure 2 shows that in the highest expenditure category, both groups had similar numbers in the pre-year, and both increased in the anchor year. However, the number of ICCM members in the highest expenditure category remained consistent from the anchor year to the post-year, while the number in the Comparison group decreased. The ICCM group saw a greater decrease than the Comparison group in the \$50,000–\$75,000 and \$75,000–\$100,000 expenditure categories from the anchor year to the post-year but a greater increase than the Comparison group in the lowest annual expenditure categories (<\$25,000 and \$25,000 – <\$50,000) from the anchor year to the post-year. Both findings indicate a shift to lower-cost services and less acute care. The Comparison group did not see this shift to the same degree although the group had higher volume in the lowest expenditure category (<\$25,000) across all years.

The difference-in-differences for expenditures between the two groups shown in Figure 1 is not statistically significant, which is expected given the small sample size. However, the results identify trends such as the distribution of individuals in expenditure categories, warranting further analysis in future studies of complex care coordination models.

Table 2 captures subcategories of expenditures that drove average total annual expenditures. Of note, three outlier individuals with expenditures greater than \$400,000 in any year were removed for this part of the analysis. These individuals had the biggest impact on the total cost of care and the expenditures for special Medicaid services (SMS), which include services uniquely covered by Medicaid (e.g., home- and community-based services, transportation, long-term services, etc.).

**Table 2.** ICCM & Comparison Groups' Detailed Average Annual Expenditures (Pre, Anchor, & Post)

Expenditure Category		Pre-Year C: N=199 I: N=202	Anchor Year C: N=206 I: N=206	Post-Year C: N=199 I: N=200	Pre-Year to Anchor Year	Anchor Year to Post-Year	Overall (Pre to Post)
Total Cost	Comparison	\$41,111	\$46,510	\$39,319	13.1%	-15.5%	-4.4%
	ICCM	\$44,834	\$49,439	\$48,211	10.3%	-2.5%	7.5%
Total Cost Excluding SMS	Comparison	\$31,634	\$36,837	\$29,786	16.4%	-19.1%	-5.8%
	ICCM	\$36,338	\$40,070	\$36,545	10.3%	-8.8%	0.6%
Inpatient	Comparison	\$7,145	\$9,452	\$5,679	32.3%	-39.9%	-20.5%
	ICCM	\$10,317	\$11,894	\$8,590	15.3%	-27.8%	-16.7%
Outpatient	Comparison	\$5,694	\$6,653	\$5,001	16.8%	-24.8%	-12.2%
	ICCM	\$7,444	\$8,142	\$7,187	9.4%	-11.7%	-3.5%
Emergency Department	Comparison	\$1,970	\$2,611	\$1,707	32.6%	-34.6%	-13.3%
	ICCM	\$3,061	\$3,258	\$2,207	6.4%	-32.2%	-27.9%
Pharmacy	Comparison	\$9,531	\$9,299	\$9,737	-2.4%	4.7%	2.2%
	ICCM	\$8,208	\$7,814	\$8,506	-4.8%	8.9%	3.6%
Professional Mental Health	Comparison	\$741	\$788	\$671	6.4%	-14.7%	-9.3%
	ICCM	\$1,001	\$1,296	\$1,006	29.5%	-22.4%	0.5%
Professional Non- Mental Health	Comparison	\$3,829	\$4,377	\$3,772	14.3%	-13.8%	-1.5%
	ICCM	\$3,564	\$3,843	\$3,268	7.8%	-15.0%	-8.3%
Home-Based Care	Comparison	\$618	\$847	\$797	37.2%	-5.9%	29.1%
	ICCM	\$986	\$1,462	\$1,015	48.3%	-30.6%	2.9%
SMS Total	Comparison	\$9,477	\$9,674	\$9,533	2.1%	-1.5%	0.6%
	ICCM	\$8,496	\$9,370	\$11,666	10.3%	24.5%	37.3%

While the ICCM group showed an overall increase in the average per member total cost from the pre- to the post-year (7.5%) and the Comparison showed a decrease (-4.4%), the ICCM group's expenditures excluding SMS stayed relatively consistent, indicating that the increase in the post-year was attributed primarily to an increase in the SMS categories of services. Furthermore, relative to the Comparison group, the ICCM group had similar decreases in inpatient expenditures (ICCM: -16.7%; Comparison: -20.5%) and greater decreases in ED expenditures (ICCM: -27.9%; Comparison: -13.3%) from the pre- to the post-year. Areas in which the ICCM group saw a percent increase in expenditures from the pre- to the post-year included pharmacy, professional mental health services, home-based care, and SMS. Decreases in ED expenditures and increases in SMS could represent a shift to providing care in more appropriate settings, improving care management, and focusing on addressing the socioeconomic needs of the ICCM population.

## Utilization

In line with expenditure outcomes, utilization outcomes indicate that ICCM participation was associated with reduced ED utilization but without any change in the rate of inpatient stays (inpatient data not shown). While both groups saw a decline in the proportion of individuals with no ED visits from the pre- to the anchor year (Table 3), the ICCM group had an overall 17% increase from pre- to post-year in the proportion of people with no ED visits whereas the Comparison group had an overall 7% decrease. At the other end of the spectrum, both groups had relatively high percentages of members with four or more ED visits in each year; although the percentages for both declined from the pre- to post-years, the ICCM had the greater decrease (ICCM: -29%; Comparison: -21%).

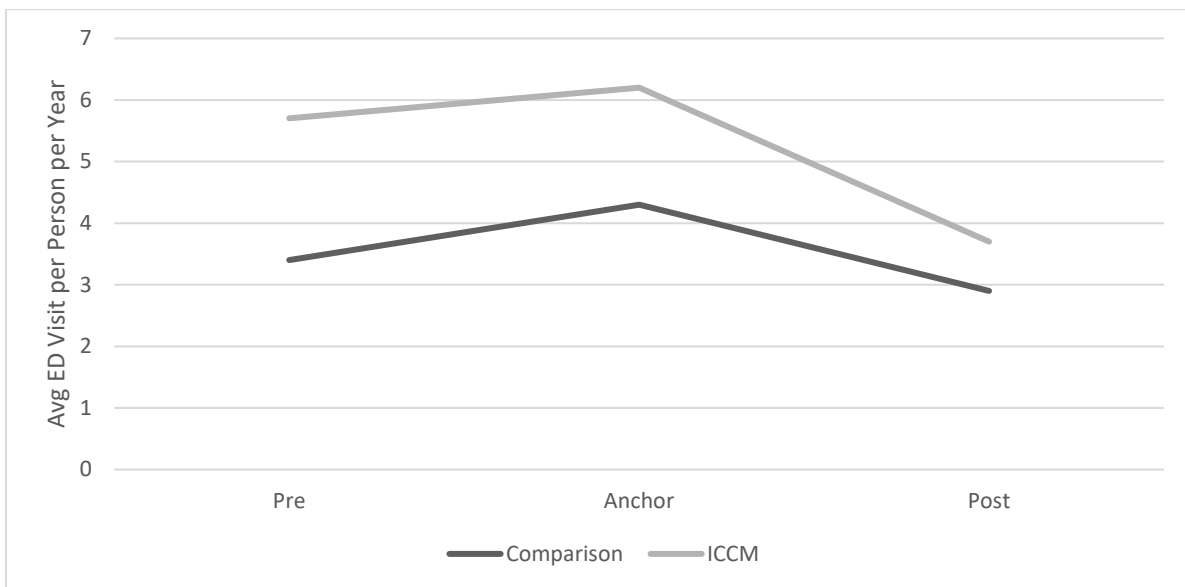


Looking at the average number of ED visits per person per year from the pre- to the post-year (Figure 3), there was a greater decline (-35%) for the ICCM group (from 5.7 to 3.7) compared to the Comparison group, which saw a 15% decline from 3.4 visits per year to 2.9 visits per year. Additionally, the ICCM group appeared to have a persistently high ED visit rate in the pre- and anchor years but a 40% decline in the post-year. The Comparison group, on the other hand, had a bigger increase from pre- to anchor year but returned to the pre-year baseline in the post-year. Of note, the 40% decrease in ED visit rate for the ICCM group is statistically significant and is also statistically significantly different from the Comparison group's decrease – that is, the ED visit rate dropped significantly more for the ICCM group than for the Comparison group from the anchor year to the post-year. Overall, while the findings for the Comparison group were mixed, the pattern for the ICCM group illustrated a shift from high utilization of the ED to lower utilization after joining the ICCM.

**Table 3.** ICCM & Comparison Groups' Emergency Department Utilization (Pre, Anchor, & Post)

Number of ED Visits		Percent of People (N=209)			Percent Change		
		Pre	Anchor	Post	Pre to Anchor	Anchor to Post	Pre to Post
None	Comparison	42%	26%	39%	-37%	47%	-7%
	ICCM	32%	25%	37%	-21%	48%	17%
1	Comparison	13%	20%	18%	50%	-12%	32%
	ICCM	16%	19%	21%	15%	10%	26%
2	Comparison	10%	14%	11%	43%	-20%	14%
	ICCM	10%	13%	9%	29%	-33%	-14%
3	Comparison	7%	5%	10%	-27%	91%	40%
	ICCM	6%	5%	8%	-8%	55%	42%
4+	Comparison	28%	34%	22%	22%	-35%	-21%
	ICCM	36%	38%	26%	5%	-33%	-29%

**Figure 3.** ICCM & Comparison Groups' Average Annual Emergency Department Visits per Person (Pre, Anchor, & Post)



Regarding inpatient discharges, the vast majority had no inpatient stays across all three years of this analysis. However, the proportion with no inpatient stays declined for both groups (ICCM: 85% to 75%;

Comparison: 88% to 79%). When looking at the average rate of inpatient discharges from the pre- to the post-year, the Comparison group had a modest increase (i.e., .5 to .8 discharges per person per year) relative to the ICCM group, which increased from .5 to 1.5 discharges per person per year. Finally, both groups had similar patterns in visits to primary care providers – the average number of primary care visits was 6.9 for the ICCM group and 7.2 for the Comparison group in the pre-year. Both groups saw an increase in the anchor year and an overall decline in the post-year to an average of 6.3 for the ICCM group and 6.6 for the Comparison group.

## Summary of Findings

Findings suggest that the population participating in the ICCM Learning Collaborative did not show a decrease in overall health care expenditures. However, the findings do indicate a shift in patterns of care for the ICCM group away from emergency care and towards care management and services that address socioeconomic needs. Specifically, the ICCM group had a greater decrease in emergency department (ED) visits and expenditures and a greater increase in expenditures for home- and community-based services relative to the matched Comparison group. However, only the differences in ED utilization and expenditures, both over time and between groups, were statistically significant.

Other outcomes, such as expenditures, while not statistically significant, signal trends that warrant further investigation to understand more fully changes in care patterns. Such future studies should address some of the limitations in this study. For example, this study did not investigate the characteristics and diagnoses of those in the highest expenditure group (i.e., the \$100,000+ category) relative to the other expenditure categories. Such an analysis might provide insight into why the expenditures for members in this highest category persisted, while the expenditures for members in the lower expenditure categories appeared to reduce over time. Also, the 12-month post period may not have been sufficiently long for effects of the ICCM intervention to become apparent. Additionally, the persistently higher expenditures for the ICCM group could indicate the limits of using only claims data to identify a matched comparison group. Given the psychosocial and health complexities of the ICCM group, claims may not fully capture all relevant characteristics, such as social determinants of health and severity of conditions that, if included, would identify a better matched comparison group. Therefore, future analyses should consider integrating other data sources.