The Impact of Bundling Payment on Health System Cost: Real world evidence from Ontario's Integrated Funding Models

Abstract

Background & Objectives
Many health systems are implementing various forms of bundled payment to improve care efficiencies. Bundles that include acute and post-acute care for specific conditions are amongst the most popular programs. Few evaluations have examined bundled payment in the context of publicly financed universal health care. In 2015, the Ministry of Health and Long-Term Care in Ontario, Canada implemented a bundled payment initiative for acute and post-acute care. The goal of the initiative – termed the Integrated Funding Model project (IFM) - was to test innovative approaches to integrate care and payment over a patient's episode beginning in acute care and including post-discharge care up to 60 or 90 days. We conducted a quantitative comparative effectiveness evaluation of the IFM program that included acute and post-acute care, for a variety of conditions ranging from heart failure to cardiac surgery. The objective was to determine whether IFM affected total system cost during the bundle period.

Methods
IFM patients were identified by each project's registry and/or identifiers in acute hospital records. Patient identifiers were linked to comprehensive health administrative data to provide a total-system cost perspective. A pool of historical comparators from the same facilities and concurrent and historical comparators from comparator facilities that met the same enrolment criteria as the IFM patients were identified. IFM patients were matched on age, sex, and propensity score, to each comparator group and Difference-in-Difference analysis was completed. The primary outcome was total system cost. Other outcomes included acute Length of Stay (LOS), readmissions and total inpatient days and Emergency Department (ED) visits within bundle periods (commonly 60- days and up to 90-days).

Results
We observed a statistically significant reduction in mean total costs within 30-days that were $1,297 greater, -$2,110 for IFM patients vs -$814 for non-IFM patients; within 90-days the reduction was $1,719 greater, -$3,035 for IFM patients vs -$1,316. Combined results across all programs demonstrated significant comparative reductions in all utilization measures at 30-days, 60- and 90-days. There were important differences across the six programs in results for intervention and comparative outcomes. A surgical program achieved a 22% comparative reduction in a composite measure of ED visits or death within 30 days. One large program for Chronic Obstructive Pulmonary Disease (COPD) and Congestive Heart Failure (CHF) patients had considerable success in reducing index LOS, as well as readmission LOS, leading to a 17% comparative reduction in total inpatient days at 90 days post-index event discharge. Overall these two projects achieved comparative reductions in LOS for index admission. Patient enrolment was lower and variability was high in the other four programs.

Conclusion
Overall, the IFM program reduced per-patient mean cost and improved quality (as measured by intensity of hospital use and mortality). The cardiac surgical pathway resulted in high enrolment levels and significant cost savings. Although two programs for chronic conditions (COPD and CHF), achieved low penetration and did not significantly reduce readmissions relative to comparators, the third program that achieved substantially higher penetration produced significant savings in cost and in acute care days. The results align with other bundled payment evaluations in providing a more clear case for bundled payment for surgical over medical patients groups.

Introduction

Bundled funding has gained increasing popularity across health systems in recent years as an opportunity to improve value by reducing health costs and maintaining or improving health outcomes. The Netherlands has advanced this approach through funding bundles for chronic conditions including diabetes (Struijs and Bahn 2011) while programs in the United States have focused on episodic care including acute and post-acute care, mostly for planned surgical care (Aggarwal et al., 2019). Several goals exist for these programs including improved coordination of care and better patient (and sometimes provider) experience, but the primary motivator is cost efficiencies. In the case of episodic bundled funding, cost efficiencies (sometimes termed as 'value' because they aim to achieve equivalent outcomes at lower cost) may result from lower transaction costs, but primarily they result from increased incentives to decrease total costs of care by reducing acute hospital length of stay and shifting care to lower-cost community settings earlier in the patient episode.

Research on bundled payment has provided relatively clear direction. A systematic review identified that lower extremity joint replacement programs (hips and knees) provided the greatest evidence of success in reducing cost without affecting quality whilst the evidence for other conditions was less certain (Agarwal et al 2019). The predictability of outcomes and homogeneity of orthopedic surgery is a likely explanatory factor.

There are a variety of ways in which bundled payment might lead to cost efficiencies. One is to consider transaction costs. In this case the payer provides a single payment to one accountable provider for an entire episode of care rather than setting out contracts for various agents in acute and post-acute delivery including institutional and non-institutional agents as well as physicians. In reality, this is a slight of hand as the transaction costs are passed to the bundle-holder who then has to equally contract with multiple post-acute providers unless the provider is a direct owner of all acute and post-acute care enterprises. A second opportunity to create cost efficiencies is to move the decision-making closer to the level of patient care and to increase the use of lower-cost post-acute care settings (more home and community-based and less institutional care). This may be accompanied by more opportunities for earlier acute care discharge. A third opportunity to create cost efficiencies is to improve the quality of care transitions and reduce the rate of recidivism or readmission to acute care.

A few key themes have arisen from the literature regarding bundled payment. The first is that the payment should be comprehensive of all care and costs required to achieve the care and outcomes required for a patient condition. Missing out on key care components may contribute to care and cost-shifting to providers who are outside of the bundle. This was the experience of early examples of diabetes bundled payments in the Netherlands (Struijs and Bahn 2011). The second is that the more controllable the care pathway, and the fewer providers involved, the more likely that cost-efficiencies will be achieved (Agarwal 2019 et al; Jacobs et al 2015). This second point is paramount to understanding the higher likelihood of efficiencies for highly predictable trajectories such as for musculoskeletal conditions – particularly lower extremity joint replacements in contrast to the management of medical (e.g. cardiovascular and respiratory) conditions and extending perhaps to the surgical management of cardiac conditions.

The Netherlands and the United States have been earlier adopters of long-term and episode-based bundled payment. While the Netherlands have focused on community-based models centred in primary care, the Medicare program in the United States focused on acute episodes of care. Both countries have some degree of competitive markets which may play a role in the use of bundled payments. There is little evidence regarding the use of bundled payment in universal public insurance systems such as that in Canada. In 2015, the Ministry of Health and Long Term Care (MOHLTC) in Ontario Canada created a program of bundled payment including acute and post-acute care for periods of up to 60 and 90 days post-discharge. At the outset, the MOHLTC did not specify specific conditions as in the United States examples of the Bundle Care Payment Initiative, Acute Care Episodes or Comprehensive Care for Joint

Replacement models. Instead, the MOHLTC issued a call for Expressions of Interest from the health system (including hospitals, home care providers, physicians and others) to participate in a bundled payment initiative – termed the Integrated Funding Model project (IFM). The goal of this initiative was to test innovative approaches to integrate care and funding over a patient's episode of care beginning in acute care and including home/community care post-discharge.

Fifty programs applied to the IFM program and six teams were selected to receive project management funding to support implementation of IFM (MOHLTC 2022). While the program aimed to reduce acute length of stay, readmission to hospital and emergency department visits, it is also important to have a broad assessment of the effects to capture potential cost-shifting to care delivered by providers not included in the payment bundle. Therefore, the purpose of this study was to evaluate the six teams to determine whether IFM affected total system cost during the bundle period.

Methods

Study setting

The province of Ontario is located in central Canada and is the most populous province with over 13 million residents, representing 40% of the Canadian population [25]. Ontario has a universal public health care system, the Ontario Health Insurance Plan (OHIP), which is paid for by the Ontario Ministry of Health and Long-Term Care (MOHLTC) from general taxation revenues. The MOHLTC pays for all medically necessary physician and hospital-based care (free at the point of care), as well as home care and long-term care services. For persons aged 65 or over, those supported by provincial social assistance payments, and/or those with relatively high drug costs, the MOHLTC provides pharmaceutical coverage subject to an income tested nominal dispensing fee co-payment. Long-term care residents pay for the cost of room and board based on a ministry regulated co-payment structure [26], otherwise the public system provides cost-free care at the point of service. Residents pay privately for dental care, eye care, outpatient rehabilitation (e.g., chiropractic, physiotherapy, naturopathic), and other services.

The Programs

The study population of interest were individuals enrolled in the six IFM programs. Five programs involved acute inpatient care with three focused on patients admitted with chronic obstructive pulmonary disease (COPD) and/or heart failure (HF), one focused on patients with stroke, and one on cardiac surgery. The last program focused on patients presenting in the emergency department for urinary tract infections (UTI) and cellulitis. The COPD/HF programs and the UTI/cellulitis programs each had bundle periods of 60 days; the cardiac surgery program had a bundle period of 30 days and the stroke program a period of up to 104 days. All programs include acute and post-acute home care. The stroke program also included inpatient rehabilitation and related post-acute care settings. No program included physician or medication costs.

Data sources

Population

Each program was expected to create a registry of all enrolled patients including patient health card numbers and enrolment date. The acute inpatient programs also used the hospital discharge abstracts to record enrolment in the IFM program. These sources served to define the enrolment population for this study. The registries were transferred to ICES which is an organization that hosts a repository of all health administrative data for the province of Ontario and where data may be used for program evaluation and planning purposes. The registries were linked deterministically to population-based health administrative data at the individual level with the use of unique, encoded identifiers. All patients enrolled in the IFM program between October 2015-March 2018 were included in this study.

Ontario has a rich population-based system of health administrative data. All publicly funded health care encounters are captured in health administrative databases collected by the Canadian Institute for Health Information (CIHI) and the MOHLTC and stored at ICES. The data sources used for this study included the Registered Persons Data Base, which contains basic demographic and vital statistics information on

all persons who are eligible for provincial health insurance. Data from sectors along the continuum of publicly funded health care were linked to the base cohort over time and included: hospital records from acute care (inpatient acute, designated inpatient mental health care, and same day surgery); emergency department; inpatient rehabilitation; inpatient complex-continuing care; residential long-term care; physician billings; and outpatient drug prescriptions. Patient records were anonymized and de-identified prior to analysis.

Study design

We aimed to undertake a difference-in-difference quasi-experimental study design. This required creating comparable historical cohort in the participating organizations as well as creating comparable concurrent and historical cohorts from comparable organizations not participating in the IFM program. The most substantive threat to validity in evaluating a voluntary program is non-equivalence between intervention and comparator groups. This may be affected by differences in organizations that participate and in the selection of patients to enrol in the programs. To mitigate these risks, we worked with each IFM program to identify a set of up to 5 comparable hospital sites in terms of patient population and service lines. IFM patients were then matched within and across sites on age, sex, and propensity score, to each comparator group and Difference-in-Difference analysis was completed.

Comparators

For each IFM project, we identified three cohorts of hospital admissions (ED visits for the UTI/cellulitis) meeting the same enrolment criteria as the IFM enrollees, as best these criteria could be identified in administrative data (enrolment criteria varied by IFM project and may be found in Supplementary Appendix 1). The three cohorts were 1) historic admissions to the same facilities for each IFM program from October 2011-September 2014; 2) admissions to comparator facilities (identified as peers by the IFM facilities) during the same time period as the IFM project (October 2015-March 2018); and 3) historic admissions to these comparator facilities (October 2011-September 2014).

Individuals were matched 1:1 using the nearest-neighbour greedy algorithm on five criteria with equal weighting: 1) on the basis of the logit of their propensity score with a caliper set at 0.2 times the standard deviation; 2) age in days ± 365 days; 3) sex; and 4) index admission or ED visit. In one program, condition (COPD or CHF) was included as a hard matching characteristic because the patient selection criteria varied for each condition. Wider age intervals were employed for some projects to improve the matching rate (e.g. if there were relatively few individuals historically to match to IFM enrollees). In particular one COPD/CHF program used age in days ± 730 days, and the stroke program and a region-wide COPD/CHF program used age in days ± 1835 days. We chose to relax the constraint on age rather than other measures so as to ensure clinical comparability.

Exclusion criteria. Records were excluded from the analysis prior to matching if they had an index hospitalization longer than 30 days, were subsequent hospitalizations during the follow-up period, were missing enrolment or encrypted identifiers or did not meet enrolment criteria (e.g. were not admitted for program conditions). Patients who died during the follow-up period were included.

Propensity Model Specification and Matching Criteria

The propensity score was based on a regression of IFM enrolment on socio-demographic variables (income quintile, RIO), comorbidity (CADGs 1-12) with all two-way interactions between CADGs, prior ED visits and hospital admissions, and project specific variables as required. Program-specific variables included condition (COPD vs CHF except for program with hard-match); Thrombolysis (tPA), discharge destination (inpatient rehab or home) and intervention (Endovascular thrombectomy (EVT)) for stroke; and urgent/elective admission category and procedure for the cardiac surgery program. When matching current with historic, an institution identifier was also included in the propensity score. Final model specifications were guided by the resulting number of enrollee-comparator pairs that matched and overall balance between groups and was an iterative process.

Covariate balance between selected enrollees and selected comparators was assessed using standard differences, with a standard difference less than 0.10 indicating balance, and variance ratios, with values closer to 1.0 indicating balance. Chi-square, one-way ANOVA or Cochran-Armitage trend test, as appropriate, were also used to compare matched groups. We also assessed potential bias by comparing standard differences for the baseline covariates between enrollees selected vs not selected by the matching algorithm (i.e. comparing enrollees that were assigned a comparator match to those where no match was available).

Baseline Covariates

Baseline covariates (age, sex, comorbidities, income quintile and rural residence status) were captured as at the index admission for IFM enrollees and non-IFM patients. The 2008 Rurality Index of Ontario (RIO, Kralj 2008) was used to define rural residence based on the patient's postal code. A variety of variables, such as travel time to various health care providers and healthcare workforce, are used determine RIO, which is on a scale of 0 (urban) and 100 (rural). To measure socio-economic status neighbourhood-level income quintile was assigned to each patient based their postal code. Patient multi-morbidity was measured using Collapsed Adjusted Clinical Groups (CADGs) from the Johns Hopkins ACG® System Ver 10 using a 2-year look back from the index admission and included the index admission. Multi-morbidity has been shown to relate to health service utilization and outcomes (Starfield & Kinder, 2011). The CADGs are based on diagnostic codes found in acute, ambulatory and physician billing records. CADGs have 12 categories and include: acute minor, acute major, likely to recur, asthma, chronic medical unstable, chronic medical stable, chronic specialty stable, eye/ dental, chronic specialty unstable, psychosocial, preventive/ administrative, and pregnancy. The number of emergency department visits and hospital admissions in the 365 days prior to the index event were also included as baseline covariates.

Outcomes

All outcomes were assessed at 30, 60 and 90-days post-discharge from the index hospitalization. We include composite outcomes including death for utilization measures of readmission and emergency department visits to ensure we do not bias results from premature mortality in intervention or comparator results.

Mean Total Costs were calculated including index event and all subsequent health care use. Costs for acute inpatient care, inpatient rehabilitation care, ambulatory care including day surgery, physician billings, post-acute skilled nursing and residential long-term care, home care and medications dispensed were included. We determined nominal costs for each encounter with the health care system using algorithms that have been implemented at ICES and are based on costing methods using administrative data. (Wodchis et al, 2013). We did not include outpatient rehabilitation costs as this was not available for the comparators. To better account for savings resulting from reduced length of stay (LOS), for each acute episode, we determined the marginal cost per day using Ontario case costing data and applied this rate to the difference between actual and expected LOS. This value was subtracted from the acute cost for each person determined using the average cost per case formula described in the cited methodology. All costs are presented in 2016 values. Prices prior to 2016 were in/de-flated using the healthcare specific consumer price index.

Mean LOS of the Index Event

Readmission or Death Rate 0-30, 0-60 and 0-90 days post index event discharge. This indicator counts the number of individuals with at least one readmission episode or who died during the indicated time-frame.

ED Visit or Death Rate 0-30, 0-60 and 0-90 days post index event discharge. This indicator counts the number of individuals with at least one ED visit or who died during the indicated time-frame. This indicator includes all unscheduled visits to an Ontario emergency department.

Mean Total Days in Hospital combines the LOS of the Index Event and LOS of any readmissions 0-30, 0-60 and 0-90 days post index event discharge.

Statistical Analyses: Difference-in-Differences Estimation
A comparative effectiveness evaluation using a DID approach with generalized estimating equations (GEE) was performed for each outcome. Total cost, LOS of the Index Event, total number of days in hospital, number of readmissions and ED visits were modelled with a negative binomial distribution and log link. Output from these models can be interpreted as rates, with rate ratios (RR) used to compare differences. Readmission and ED visit rates were modelled with a binomial distribution and identity link. Output from these models provide absolute differences. For each outcome, models included binary variables for enrolment status (enrollee or comparator), time period (pre- or post-index) and an interaction term between these variables - the DID estimator. To account for clustering of individuals due to matching, we created a variable identifying the matched groups and included it in the repeated statement. We specified an unstructured correlation structure for all analyses.

Approval to complete this study was granted by the University of Toronto Research Ethics Board.

Results

Propensity Matching
After the three rounds of matching a total of 4,977 out of 6,005 IFM enrollees were matched to historical IFM comparators and non-IFM comparators (pre- and post-pilot time frames) resulting in an 82.9% matching rate overall (range 77.3%-95.6% at the program level). Table 1 shows the baseline characteristics of matched enrollees compared to comparators for all projects combined. Standard differences and variance ratios for each variable are shown. For all projects combined, balance between matched groups was very good for all common covariates with all standard differences less than 0.10. Supplementary Appendix 2 provide program-specific results where balance was excellent in the largest programs with weakest results in the two smallest programs.

Difference-in-Differences Estimation
Table 2 illustrates the pre- and post-pilot results for all 6 pilot projects combined. We observed statistically significant improvements in nearly all outcomes over time for patients from the IFM pilot project facilities. Total mean cost at 30 days for patients enrolled in IFM programs was $2110 lower than matched historical comparator patients at the same host organizations whilst costs decreased by $863 for patients at non-participating sites. The reductions in cost at comparator sites highlights the effects of cost pressures and increases in efficiency across the health system concurrent with the introduction of the IFM program and the importance of the difference-in-differences design. The incremental total mean cost savings per patient for the IFM program was $1297 at 30 days, $1673 at 60 days and $1719 at 90 days.

The cost savings were accrued in part due to shorter index hospitalization length of stay with an incremental LOS reduction of 0.68 days per patient with total hospital days (including index) being incrementally reduced by 0.75 days, 0.82 days and 0.89 days at 30, 60 and 90 days respectively for patients in the IFM sites compared to non-IFM sites. Hospital readmission or death as a composite outcome was similarly reduced for across all time points with the reductions coming from changes only in the IFM sites as compared to no change in hospital readmission or post-acute ED visits amongst patients discharged from comparator sites. All aggregate results were statistically significant at the 0.01 level with most results significant at the 0.001 level.

Individual program results are included as supplementary material. The overall IFM program results are largely due to the two largest programs which provided the greatest reductions in acute hospital days and greatest total cost reductions. The other programs provided only few results that would support incrementally statistically significant reductions in the IFM as compared to patients discharged from comparator organizations. With relatively small numbers in some of the programs and with complete population level data for all hospitals during the study, we examined the capture rate of the IFM programs. Specifically we counted the IFM enrolled patients as a proportion of all patients discharged

from the participating IFM hospitals who met the basic eligibility criteria as a discharge (or ED admission) with the specified conditions. The cardiac surgery program achieved 92% enrolment the stroke program 41%, the COPD/CHF programs achieved approximately 40% in the largest program but only 11% and 12% in the other two programs. The ED program appeared to achieve only 4.3% enrolment amongst all ED visits during the study period for UTI/cellulitis (See Table 3).

Discussion

This study provided a robust analysis of a novel implementation of bundled payment pilot program in Ontario, Canada. The program was launched as single initiative justifying a pooled analysis of the data although the statistical matching and analyses were also undertaken for each individual program site. Overall we found that the IFM program was highly successful resulting in substantial cost savings per patient even after considering total health system costs, indicating that costs were not merely shifted to other health sectors not included in the bundled payment (e.g. physician, pharmacy, institutional post-acute care). The total incremental average savings per patient across all programs amounted to approximate 10% of expenditures. This was largest in the largest COPD/CHF program which achieved nearly 15% savings at 90 days whilst savings in the cardiac surgery program are also noteworthy at 7%. The achievement of these two programs have comparators in Medicare bundled payment programs. One study found a nonsignficant $514 increase in episode payments for cardiac surgery in the Acute Care Episode (ACE) demonstration project (Chen et al 2018), whilst another found a nonsignificant decrease in costs for cardiac valve replacements in the Bundled Payments for Care Initiative (BPCI) (Jubelt et al. 2017). Similarly, Joynt and colleagues found Medicare expenditures for COPD and CHF conditions were not statistically different under BPCI using a similar difference-in-differences methodology. (Joynt et al 2019). The vast majority of evidence regarding the savings associated with bundled payment instead has come from studies examining lower extremity (hip and knee) joint replacements (Agarwal et al. 2019; Hussey et al, 2012; Jacobs et al, 2015). Curiously perhaps, this was not a condition selected by any of the successful applicant teams in the IFM program.

It is critical to note that not only did these programs generally produce cost savings, but they did so without obvious gaps in quality; composite outcomes of readmission to hospital and ED visits or death at 30, 60 and 90 days reduced more in the IFM programs than in comparators. The present analyses may be somewhat incomplete as we did not capture more subtle potential harms such as hospital-acquired infections, medication errors, gaps in follow-up or functional decline, or even patient experience. Although we did not include program administration funding of approximately $150,000 per year per program, the overall cost savings of the program are substantially larger. With an average cost savings of $1719 at 90 days for 6005 enrolled patients, the total program savings amount to $10,322,595. This may be compared favourably for example to cost savings of approximately $4 Million amongst 12,501 Medicare enrollees in the ACE model (Struijs et al 2020).

Costs captured here are only those for health care services paid by the MOHLTC. There may be other unmeasured social costs. Earlier discharge from acute hospital may have placed additional costs on patients and their caregivers. The caregivers themselves may have experienced increased burden in caring for patients discharged earlier from hospital and with more days at home.

We were also not able to fully identify comparable patients for matching in a few of the programs. For example one of the COPD and CHF programs sought to provide improved pathways for patients with moderate severity which was identified in hospital medical records based on forced expiratory volume and another based enrollment on admission to a specific hospital unit. This raises the issue of coverage of the programs themselves. The result of these program criteria was that they enrolled a very small proportion of otherwise generally eligible patients with these diagnoses, which itself provides questionable evidence for the real-world effectiveness of the programs to improve care outcomes at scale. The other acute-based programs for stroke and COPD/CHF that achieved approximately 40% coverage identified a different constraint in post-evaluation discussion with the programs. A large proportion of individuals

enrolled in these programs were older adults with functional limitations who received home care services prior to the acute hospitalizations. Because the programs provided a tailored home care pathway and intervention that was drawn from the same budget as existing home care services, patients had to consent to receive home care from the bundled payment program and in doing so, to replace their existing home care services with those from the bundle. Anecdotally many clients refused participation in the bundled payment pathway because they were unwilling to give up their existing home care service providers with whom they had often built relationships and had come to trust.

The duration of this evaluation extended beyond most of the payment bundle periods but was shorter than the maximum program duration of 104 days in the stroke program. The convenience of consistent durations for the joint analysis across all programs outweighed the advantages of complete analysis by extending all analyses to the maximum duration or adjusting for differential periods. The durations here are also in line with typical evaluation durations for bundled payment.

The data for this study are largely based on clinical administrative data which lack clinical detail regarding the disease severity across the population groups. In the cardiac program, there is little opportunity for selection however in other programs, the extent of difference in clinical severity between the intervention and comparator populations cannot be ruled out. The analysis is also limited. While we examine the total cost of all care for each individual patient, actual cost savings may not have been achieved in aggregate at the health care budget level. Rather, savings accrued here are likely to have been spent on care for other patients. In the constrained public health care system in Ontario, hospitals are generally at or near capacity and bed-days saved for one patient population will be filled by other patients who arrive in the emergency department with other concerns. Some of these patients might be revenue producing for the hospital if they are paid for using volume-based payments (e.g. many surgical patients), while care for others (e.g. gastro-intestinal bleeding) are paid for through population-based global budgets at the hospital level. Assessing the budget impact of the IFM program at the hospital or payer level was beyond the scope of the present analysis.

Conclusions

Overall, the IFM facilities demonstrated improvements in all outcomes measured compared to the non-IFM facilities. This was however, driven by the results of the two largest IFM initiatives. Results for smaller initiative should be interpreted with considerable caution given the poor balance between the IFM and non-IFM patients on some covariates. The results of this evaluation were previously shared with the MOHLTC along with the guidance to advance with spread and replication of the bundled funding for cardiac surgery across the province as well as for staged implementation of other surgical procedures. Spread and scale of bundled payment for COPD and CHF was recommended to proceed at a slower pace until key issues regarding disruption in home care services and more comprehensive coverage of the entire clinical populations are worked out. It may in fact be that the approaches taken in the Netherlands with an emphasis on bundled payment in primary and community care for other chronic conditions may provide a more suitable approach for chronic conditions.

Table 1. Baseline Characteristics of Matched Enrollees and Comparators for All Projects Combined

All Projects Combined (n=4,977)	IFM & Historic from Same Facilities				IFM & Concurrent Comparator Facilities				Concurrent & Historic Comparator Facilities			
Variable	Enrollee Mean(SD)/%	Historic Mean(SD)/%	Std. Diff'ce	Var'ce Ratio	Enrollee Mean(SD)/%	Concurrent Mean(SD)/%	Std. Diff'ce	Var'ce Ratio	Concurrent Mean(SD)/%	Historic Mean (SD)/%	Std. Diff'ce	Var'ce Ratio
Age	70.69 ± 12.60	70.68 ± 12.58	0	1	70.69 ± 12.60	70.67 ± 12.59	0	1	70.67 ± 12.59	70.66 ± 12.60	0	1
Sex (Male)	2,976 (59.8%)	2,976 (59.8%)	0	1	2,976 (59.8%)	2,976 (59.8%)	0	1	2,976 (59.8%)	2,976 (59.8%)	0	1
Propensity	0.77 ± 1.07	0.78 ± 1.07	0.01	1.01	1.52 ± 1.22	1.56 ± 1.21	0.03	1.02	1.58 ± 1.34	1.62 ± 1.34	0.03	1
Rurality (RIO 2008)	3.03 ± 5.83	3.12 ± 6.24	0.02	0.87	3.03 ± 5.83	3.11 ± 6.10	0.01	0.91	3.11 ± 6.10	3.11 ± 6.09	0	1
CADG1 - Acute Minor	4,347 (87.3%)	4,379 (88.0%)	0.02	0.96	4,347 (87.3%)	4,362 (87.6%)	0.01	0.98	4,362 (87.6%)	4,363 (87.7%)	0	1
CADG2 - Acute Major	4,587 (92.2%)	4,582 (92.1%)	0	1.01	4,587 (92.2%)	4,621 (92.8%)	0.03	0.92	4,621 (92.8%)	4,615 (92.7%)	0	1.02
CADG3 - Likely To Recur	3,546 (71.2%)	3,536 (71.0%)	0	1	3,546 (71.2%)	3,519 (70.7%)	0.01	1.01	3,519 (70.7%)	3,551 (71.3%)	0.01	0.99
CADG4 - Asthma	561 (11.3%)	600 (12.1%)	0.02	1.06	561 (11.3%)	583 (11.7%)	0.01	1.03	583 (11.7%)	581 (11.7%)	0	1
CADG5 - Chronic Medical Unstable	4,368 (87.8%)	4,339 (87.2%)	0.02	1.04	4,368 (87.8%)	4,428 (89.0%)	0.04	0.91	4,428 (89.0%)	4,435 (89.1%)	0	0.99
CADG6 - Chronic Medical Stable	4,282 (86.0%)	4,311 (86.6%)	0.02	0.96	4,282 (86.0%)	4,314 (86.7%)	0.02	0.96	4,314 (86.7%)	4,302 (86.4%)	0.01	1.02
CADG7 - Chronic Specialty Stable	355 (7.1%)	349 (7.0%)	0	0.98	355 (7.1%)	390 (7.8%)	0.03	1.09	390 (7.8%)	408 (8.2%)	0.01	1.04
CADG8 - Eye/Dental	904 (18.2%)	962 (19.3%)	0.03	1.05	904 (18.2%)	899 (18.1%)	0	1	899 (18.1%)	920 (18.5%)	0.01	1.02
CADG9 - Chronic Specialty Unstable	1,056 (21.2%)	1,045 (21.0%)	0.01	0.99	1,056 (21.2%)	1,060 (21.3%)	0	1	1,060 (21.3%)	1,017 (20.4%)	0.02	0.97
CADG10 - Psychosocial	1,935 (38.9%)	1,891 (38.0%)	0.02	0.99	1,935 (38.9%)	1,905 (38.3%)	0.01	0.99	1,905 (38.3%)	1,933 (38.8%)	0.01	1.01
CADG11 - Preventive/ Administrative	2,074 (41.7%)	2,130 (42.8%)	0.02	1.01	2,074 (41.7%)	2,101 (42.2%)	0.01	1	2,101 (42.2%)	2,171 (43.6%)	0.03	1.01
CADG12 - Pregnancy	17 (0.3%)	14 (0.3%)	0.01	0.82	17 (0.3%)	11 (0.2%)	0.02	0.65	11 (0.2%)	11 (0.2%)	0	1
Income Quintile (0-20)	1,126 (22.6%)	1,121 (22.5%)	0	1	1,126 (22.6%)	1,158 (23.3%)	0.02	1.02	1,158 (23.3%)	1,149 (23.1%)	0	0.99
Income Quintile (20-40)	1,069 (21.5%)	1,052 (21.1%)	0.01	0.99	1,069 (21.5%)	1,111 (22.3%)	0.02	1.03	1,111 (22.3%)	1,128 (22.7%)	0.01	1.01
Income Quintile (40-60)	1,046 (21.0%)	1,066 (21.4%)	0.01	1.01	1,046 (21.0%)	1,026 (20.6%)	0.01	0.99	1,026 (20.6%)	1,006 (20.2%)	0.01	0.99
Income Quintile (60-80)	952 (19.1%)	944 (19.0%)	0	0.99	952 (19.1%)	918 (18.4%)	0.02	0.97	918 (18.4%)	942 (18.9%)	0.01	1.02
Income Quintile (80-100)	784 (15.8%)	794 (16.0%)	0.01	1.01	784 (15.8%)	764 (15.4%)	0.01	0.98	764 (15.4%)	752 (15.1%)	0.01	0.99
Number of hospital admissions 1-year prior	0.62 ± 1.18	0.63 ± 1.14	0.01	1.09	0 (0.0%)	*1 - 5	0.03	.	0.67 ± 1.17	0.67 ± 1.19	0	0.97
Number of ED visits 1-year prior	1.58 ± 2.26	1.55 ± 2.30	0.02	0.97	0 (0.0%)	356 (7.2%)	0.39	.	1.65 ± 2.18	1.64 ± 2.24	0	0.95

Table 2. DID Model Estimates for All Projects Combined

Outcome	Time Period (sample size)	Group	Pre (10/2012-09/2014)	Post (10/2015-03/2018)	Relative Difference (post / pre)	Absolute Difference (post - pre)	p-value	DID (Relative)	DID (Absolute)	p-value
Mean Total Cost	30-days	IFM	$ 13,444	$ 11,334	0.84	-$ 2,110	<.0001	0.9	-$ 1,297	0.0001
		non-IFM	$ 12,883	$ 12,069	0.94	-$ 813	0.0007			
	60-days	IFM	$ 16,068	$ 13,412	0.83	-$ 2,656	<.0001	0.89	-$ 1,673	0.0003
		non-IFM	$ 15,607	$ 14,625	0.94	-$ 982	0.004			
	90-days	IFM	$ 18,169	$ 15,134	0.83	-$ 3,035	<.0001	0.9	-$ 1,719	0.002
		non-IFM	$ 17,934	$ 16,618	0.93	-$ 1,316	0.002			
Mean Index Total LOS (days)		IFM	7.22	5.96	0.83	-1.26	<.0001	0.9	-0.68	<.0001
		non-IFM	7.14	6.56	0.92	-0.57	<.0001			
Readmission or Death Rate	30-days	IFM	0.25	0.19	0.76	-0.06	<.0001	0.77	-0.06	<.0001
		non-IFM	0.23	0.23	1	0	0.87			
	60-days	IFM	0.31	0.25	0.8	-0.06	<.0001	0.82	-0.05	<.0001
		non-IFM	0.29	0.29	0.98	-0.01	0.39			
	90-days	IFM	0.34	0.28	0.82	-0.06	<.0001	0.85	-0.05	<.0001
		non-IFM	0.33	0.32	0.97	-0.01	0.25			
ED Visit or Death Rate	30-days	IFM	0.33	0.27	0.82	-0.06	<.0001	0.81	-0.06	<.0001
		non-IFM	0.33	0.33	1.01	0	0.83			
	60-days	IFM	0.41	0.36	0.87	-0.05	<.0001	0.88	-0.05	0.0001
		non-IFM	0.41	0.41	0.99	0	0.81			
	90-days	IFM	0.45	0.41	0.91	-0.04	<.0001	0.91	-0.04	0.002
		non-IFM	0.45	0.45	1	0	0.97			
Mean Total Days in Hospital	30-days	IFM	5.9	4.75	0.81	-1.14	<.0001	0.87	-0.75	<.0001
		non-IFM	5.72	5.33	0.93	-0.39	<.0001			
	60-days	IFM	6.59	5.32	0.81	-1.27	<.0001	0.87	-0.82	<.0001
		non-IFM	6.46	6.01	0.93	-0.45	0.001			
	90-days	IFM	7.1	5.85	0.82	-1.25	<.0001	0.87	-0.89	<.0001
		non-IFM	6.98	6.62	0.95	-0.36	0.04			

Table 3. Number of IFM Enrollees and Non-Enrolled Eligible Patients from IFM Facilities, by IFM Project

	COPD/CHF P1	COPD-CHF P2	COPD-CHF P3	UTI/cellulitis	Stroke	Cardiac Surgery
Enrollees Used for Matching	2,516	171	238	642	513	1,925
Non-Enrolled Eligible Patients from IFM Facilities	3,821	1,403	1,788	14,345	745	165
Total eligible patients from IFM Facilities	6,337	1,574	2,026	14,987	1,258	2,090
% of patients enrolled	**39.7%**	**10.9%**	**11.7%**	**4.3%**	**40.8%**	**92.1%**

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Supplementary Materials

Supplementary Appendix 1. Enrolment Criteria

*Criteria in red were not available in administrative data and not included in the eligibility algorithms.

Project #1 – COPD/CHF program 1 large regional program*:*
Inclusion Criteria:
COPD
dx10code = (J41* J42* J43* J44* excluding J43.0 J43.1 J43.2) AND dxtype = (M)
WHERE (age>=35 AND MCC_PART^=I AND dischdisp=04)
CHF
(dx10code = (I50* I40* I41* I42* I43* I25.5) AND dxtype = (M))
OR
(dx10code = (I50*) AND dxtype = (1 2 W X Y)
AND dx10code=(I11 I13) AND dxtype=(M))
WHERE (age>=20 AND MCC_PART^=I AND dischdisp=04)
Exclusion Criteria:
Residing outside of HNHB LHIN
Residing in Long Term Care
Palliative care + discussion with patient/family and palliative care team deeming it not appropriate to transfer patient to ICC program for 60 days (palliative care is not an exclusion criterion alone, needs to be clinically discussed)

Project #2 – COPD/CHF program 2: single hospital unit
CHF
Inclusion Criteria:
CHF
(dx10code = (I50* I40* I41* I42* I43* I25.5) AND dxtype = (M))
OR
(dx10code = (I50*) AND dxtype = (1 2 W X Y) AND dx10code=(I11 I13) AND dxtype=(M))
WHERE (age>=20 AND MCC_PART^=I AND (dischdisp=04 OR dischdisp=05))
Live within the C LHIN or, as of June 2016, within TC or CE LHIN
Most Responsible Unit 6W (patients admitted to 6W)
Exclusion Criteria:
Cognitive impairment without caregiver support at home to assist with chronic disease self-management
Palliative prognosis of < 3 months
COPD
Inclusion criteria:
COPD
dx10code = (J41* J42* J43* J44* excluding J43.0 J43.1 J43.2) AND dxtype = (M)
WHERE (age>=35 AND MCC_PART^=I AND (dischdisp=04 OR dischdisp=05))
Live within the C LHIN or, as of June 2016, within TC or CE LHIN
Non – ICU cases (criteria removed as of July 2016)

IFM Project #3 – COPD/CHF program 2: moderate severity COPD/CHF
Inclusion Criteria:
Integrated Funding Model Risk Stratification score of 21 or less
Dx with moderate COPD
dx10code = (J41* J42* J43* J44* excluding J43.0 J43.1 J43.2) AND dxtype = (M)
WHERE (age>=35 AND MCC_PART^=I AND (dischdisp^=01 02 03 06 07))

Dx with CHF (Added March 2017)
dx10code = (I50* I40* I41* I42* I43* I255) AND dxtype = (M)
OR
(dx10code = (I50*) AND dxtype = (1 2 W X Y) AND dx10code=(I11 I13) AND dxtype=(M))
WHERE (age>=20 AND MCC_PART^=I AND (dischdisp^=01 02 03 06 07))
Have a primary care physician
Reside in London-Middlesex
Exclusion Criteria:
FEV1>65% predicted and an MMRC 0-1
Palliative

Integrated Funding Model Risk Stratification:

Variable	**Points**			
	0	**1**	**2**	**3**
MMRC at time of potential discharge	0-1	2	3	4
FEV1 (% predicted)	>65	50-64	36-49	<35
BMI	>21	<21		
Number of previous exacerbations in past 12 months	0	1	2	≥3
Is admission due to a reason other than COPD alone	no			yes
Did patient require invasive or non-invasive ventilation during admission	no	Required non-invasive ventilation for < 12 hours	Required non-invasive ventilation for > 12 hours	Required invasive ventilation
Is patient on long-term oral steroid &/or antibiotics	no		Yes to one	Yes to both
Number of other significant comorbidities	0	1-2	3	≥4
Activity Level & Independence	Good	Moderate	Low	Very Low
Cognitive deficits	None	Mild	Moderate	Severe
Ability to self-manage	Excellent/Good	Moderate	Low	Very Low
Social determinants of health (They include income and social status; social support networks; education; employment/working conditions; social environments; physical environments; personal health practices and coping skills)	Excellent/Good	Moderate	Low	Very Low
Anxiety	None	Mild	Moderate	Severe

Depression	None	Mild	Moderate	Severe

May add: Smoking/home O2/family supports

The Modified Medical Research Council (MMRC) Dyspnoea Scale

Grade of dyspnoea	Description
0	Not troubled by breathlessness except on strenuous exercise
1	Shortness of breath when hurrying on the level *or* walking up a slight hill
2	Walks slower than people of the same age on the level because of breathlessness *or* has to stop for breath when walking at own pace on the level
3	Stops for breath after walking about 100 m *or* after a few minutes on the level
4	Too breathless to leave the house *or* breathless when dressing or undressing

IFM Project #4 – UTI/cellulitis ED visits

Inclusion Criteria
Admitted to receive short term nursing service (less than 60 days) – IV Antibiotics
Dischdisp=04 or visdisp=01, 15, 07
18 years of age or older
Referral source from Brampton Civic Hospital (BCH), Etobicoke General Hospital (EGH), Headwaters Hospital admission or ED visit for cellulitis (L03.x) or UTI (N39.0)
Exclusion Criteria
Intravenous drug use (care provided in clinic settings)
Active CCAC patient receiving third party nursing
Treatment address is outside of Central West LHIN boundaries
Requires specialty nurses services (e.g. Peritoneal Dialysis)

IFM Project #5 – Stroke

Inclusion Criteria
Acute care admission for stroke (TIA, Ischemic, Hemorrhagic) based on:
QBP criteria – (MRDx G45 except G45.4, I61, I63 except I63.6, I64, OR H34.1) AND MCC_partition^=I OR
EVT incode=(1.JE.57.GQ-GX 1.JW.57.GP-GX 1.JX.57.GP-GX) [added August 2nd, 2016]
Aged ≥ 18 years
Discharged from acute care to home with or without support (dischdisp=04 OR dischdisp=05) OR discharged to inpatient rehab (added August 2nd, 2016; dischdisp=02 AND instttyp=2 OR instttyp=7)
Exclusion Criteria
Strokes coded as post-admit complications (type 2 diagnosis)

IFM Project #6 – Cadiac surgery

Inclusion Criteria
Cardiac Surgery patients admitted to THP: incode = '1IJ76' '1HV80' '1HV90LA' '1HV90WJ' '1HJ' '1HP' '1HS' '1HT' '1HU' '1LZ37LAGB'
Surgery by a cardiac surgeon (inserv=00031, 00038, 00041, 00048
Discharged home with or without support (dischdisp=04 OR dischdisp=05)
Reside in MH or CW LHIN

Exclusion Criteria
Incode = '1HV90GPXXL' '1HV90GRXXL' '1HV90STXXL'
Patients who require post-op cardiac rehab
Patients who require post-op Long-term care

Supplementary Appendix 2: Project Specific Difference-in-Differences Results

COPD/CHF Program 1 *large regional program:*

Enrollees were identified from Special Project Field 615 and the project registry (n=3,010). A substantial portion of the identified enrolments were excluded (n=494), for not meeting administrative data enrollment criteria (see Appendix 1). Of the 2,516 IFM enrollees, we were able to match 1,946 (77%) to similar patients in the comparator groups (historical IFM, historical non-IFM and concurrent non-IFM) Attempts at hard matching on condition (COPD or CHF), resulted in substantial reduction in the number of matches and we, instead, included condition in the propensity score.

The able below shows the outcomes for COPD/CHF Program 1. Mean index total LOS decreased significantly over time for patients from IFM hospitals; it was 25% lower in the post period relative to the pre period for patients from IFM hospitals ($p<0.0001$). The proportion of patients with ALC days, ED visits or death and readmissions or death at 30, 60 and 90-days was significantly lower, in the post period relative to the pre period for patients from HNHB ICC 2.0 hospitals.

Relative to changes over time for patients from non-IFM comparator facilities, patients from IFM facilities had significantly greater decreases in mean index total LOS and ALC rate. COPD/CHF Program 1 hospitals reduced mean index total LOS by 1.3 days more than comparators over the same time period ($p<0.0001$). DID estimates were also statistically significant and in favour of IFM for 30, 60 and 90-day total days in hospital (index+readmission). HNHB ICC 2.0 also had statistically significantly greater reductions in readmission or death rate at all three time points relative to comparators, as well as for ED visit or death rate. For the 60-day bundle period, total cost reduction over time was $3,264 greater for COPD/CHF Program 1 relative to non-IFM comparators.

Baseline Characteristics of Matched Enrollees and Comparators for COPD/CHF Program 1

COPD/CHF Program 1 (n=1,946)	IFM & Historic from Same Facilities				IFM & Concurrent Comparator Facilities				Concurrent & Historic Comparator Facilities			
Variable	Enrollee Mean(SD)/%	Historic Mean(SD)/%	Standard Difference	Variance Ratio	Enrollee Mean(SD)/%	Concurrent Mean(SD)/%	Standard Difference	Variance Ratio	Concurrent Mean(SD)/%	Historic Mean(SD)/%	Standard Difference	Variance Ratio
Age	76.49 ± 10.44	76.45 ± 10.46	0	1	76.49 ± 10.44	76.46 ± 10.42	0	0	76.46 ± 10.42	76.45 ± 10.46	0	0
Sex (Male)	925 (47.5%)	925 (47.5%)	0	1	925 (47.5%)	925 (47.5%)	0	0	925 (47.5%)	925 (47.5%)	0	0
Propensity	0.32 ± 0.64	0.35 ± 0.63	0.04	1.05	0.70 ± 0.58	0.71 ± 0.57	0.03	0.03	0.48 ± 0.63	0.50 ± 0.62	0.03	0.03
Rurality (RIO 2008)	4.86 ± 7.04	4.81 ± 7.06	0.01	0.99	4.86 ± 7.04	4.89 ± 7.80	0	0	4.89 ± 7.80	4.88 ± 7.95	0	0
CADG1 - Acute Minor	1,808 (92.9%)	1,828 (93.9%)	0.04	0.86	1,808 (92.9%)	1,832 (94.1%)	0.05	0.05	1,832 (94.1%)	1,832 (94.1%)	0	0
CADG2 - Acute Major	1,813 (93.2%)	1,819 (93.5%)	0.01	0.96	1,813 (93.2%)	1,838 (94.5%)	0.05	0.05	1,838 (94.5%)	1,832 (94.1%)	0.01	0.01
CADG3 - Likely To Recur	1,458 (74.9%)	1,486 (76.4%)	0.03	0.96	1,458 (74.9%)	1,477 (75.9%)	0.02	0.02	1,477 (75.9%)	1,489 (76.5%)	0.01	0.01
CADG4 - Asthma	297 (15.3%)	336 (17.3%)	0.05	1.1	297 (15.3%)	324 (16.6%)	0.04	0.04	324 (16.6%)	323 (16.6%)	0	0
CADG5 - Chronic Medical Unstable	1,862 (95.7%)	1,860 (95.6%)	0.01	1.02	1,862 (95.7%)	1,874 (96.3%)	0.03	0.03	1,874 (96.3%)	1,876 (96.4%)	0.01	0.01
CADG6 - Chronic Medical Stable	1,734 (89.1%)	1,741 (89.5%)	0.01	0.97	1,734 (89.1%)	1,744 (89.6%)	0.02	0.02	1,744 (89.6%)	1,742 (89.5%)	0	0
CADG7 - Chronic Specialty Stable	136 (7.0%)	147 (7.6%)	0.02	1.07	136 (7.0%)	141 (7.2%)	0.01	0.01	141 (7.2%)	144 (7.4%)	0.01	0.01
CADG8 - Eye/Dental	389 (20.0%)	429 (22.0%)	0.05	1.07	389 (20.0%)	421 (21.6%)	0.04	0.04	421 (21.6%)	439 (22.6%)	0.02	0.02
CADG9 - Chronic Specialty Unstable	453 (23.3%)	448 (23.0%)	0.01	0.99	453 (23.3%)	468 (24.0%)	0.02	0.02	468 (24.0%)	459 (23.6%)	0.01	0.01
CADG10 - Psychosocial	895 (46.0%)	874 (44.9%)	0.02	1	895 (46.0%)	900 (46.2%)	0.01	0.01	900 (46.2%)	919 (47.2%)	0.02	0.02
CADG11 - Preventive/ Administrative	1,017 (52.3%)	1,057 (54.3%)	0.04	0.99	1,017 (52.3%)	1,059 (54.4%)	0.04	0.04	1,059 (54.4%)	1,069 (54.9%)	0.01	0.01
CADG12 - Pregnancy	*1 - 5	*1 - 5	0.04	2.5	*1 - 5	*1 - 5	0.02	0.02	*1 - 5	*1 - 5	0.02	0.02
Income Quintile (0-20)	635 (32.6%)	627 (32.2%)	0.01	0.99	635 (32.6%)	633 (32.5%)	0	0	633 (32.5%)	639 (32.8%)	0.01	0.01
Income Quintile (20-40)	435 (22.4%)	441 (22.7%)	0.01	1.01	435 (22.4%)	440 (22.6%)	0.01	0.01	440 (22.6%)	440 (22.6%)	0	0
Income Quintile (40-60)	362 (18.6%)	354 (18.2%)	0.01	0.98	362 (18.6%)	346 (17.8%)	0.02	0.02	346 (17.8%)	344 (17.7%)	0	0
Income Quintile (60-80)	287 (14.7%)	281 (14.4%)	0.01	0.98	287 (14.7%)	291 (15.0%)	0.01	0.01	291 (15.0%)	293 (15.1%)	0	0
Income Quintile (80-100)	227 (11.7%)	243 (12.5%)	0.03	1.06	227 (11.7%)	236 (12.1%)	0.01	0.01	236 (12.1%)	230 (11.8%)	0.01	0.01
Condition (COPD)	977 (50.2%)	978 (50.3%)	0	1	977 (50.2%)	987 (50.7%)	0.01	0.01	987 (50.7%)	1,016 (52.2%)	0.03	0.03
Condition (CHF)	969 (49.8%)	968 (49.7%)	0	1	969 (49.8%)	959 (49.3%)	0.01	0.01	959 (49.3%)	930 (47.8%)	0.03	0.03
Number of hospital admissions 1-year prior	1.10 ± 1.55	1.12 ± 1.44	0.01	1.17	1.10 ± 1.55	1.19 ± 1.52	0.06	0.06	1.19 ± 1.52	1.20 ± 1.55	0.01	0.01
Number of ED visits 1-year prior	2.37 ± 2.85	2.39 ± 2.85	0	1	2.37 ± 2.85	2.55 ± 2.69	0.06	0.06	2.55 ± 2.69	2.55 ± 2.75	0	0

DID Outcome Model Estimates for COPD/CHF Program 1

Outcome	Time Period (sample size)	Group	Pre (Oct 2012-Sept 2014)	Post (Oct 2015-Present)	Relative Difference (post / pre)	Absolute Difference (post - pre)	p-value	DID (Relative)	DID (Absolute)	p-value
Mean Index Total LOS (days)	**(n=1946)**	**IFM**	8.41	6.27	0.75	-2.14	<.0001	0.83	-1.32	<.0001
		non-IFM	8.02	7.19	0.9	-0.82	<.0001			
Index ALC Rate	**(n=1946)**	**IFM**	0.12	0.01	0.11	-0.1	<.0001	0.77	-0.1	<.0001
		non-IFM	0.06	0.06	0.97	0	0.83			
Readmission or Death Rate	**30-days (n=1946)**	**IFM**	0.28	0.19	0.7	-0.08	<.0001	0.72	-0.08	<.0001
		non-IFM	0.26	0.25	0.97	-0.01	0.56			
	60-days (n=1946)	**IFM**	0.39	0.28	0.73	-0.11	<.0001	0.74	-0.1	<.0001
		non-IFM	0.37	0.37	0.99	0	0.79			
	90-days (n=1946)	**IFM**	0.47	0.36	0.77	-0.11	<.0001	0.8	-0.09	<.0001
		non-IFM	0.46	0.44	0.97	-0.02	0.32			
ED Visit or Death Rate	**30-days (n=1946)**	**IFM**	0.35	0.28	0.8	-0.07	<.0001	0.82	-0.06	0.003
		non-IFM	0.36	0.35	0.98	-0.01	0.62			
	60-days (n=1946)	**IFM**	0.48	0.4	0.82	-0.09	<.0001	0.84	-0.08	0.0006
		non-IFM	0.5	0.49	0.98	-0.01	0.54			
	90-days (n=1946)	**IFM**	0.58	0.48	0.84	-0.09	<.0001	0.86	-0.08	0.0003
		non-IFM	0.58	0.57	0.97	-0.01	0.34			
Mean Total Days in Hospital	**30-days (n=1601)**	**IFM**	10.4	7.4	0.71	-2.99	<.0001	0.79	-2.02	<.0001
		non-IFM	9.74	8.76	0.9	-0.98	0.0001			
	60-days (n=1378)	**IFM**	11.82	8.48	0.72	-3.34	<.0001	0.82	-1.83	<.0001
		non-IFM	11.6	10.09	0.87	-1.51	<.0001			
	90-days (n=1165)	**IFM**	13.25	9.5	0.72	-3.75	<.0001	0.83	-1.97	0.001
		non-IFM	13.13	11.35	0.86	-1.78	0.0005			
Mean Total Cost	**30-days (n=1220)**	**IFM**	$ 16,165	$ 11,573	0.72	-$ 4,592	<.0001	0.81	-$ 2,804	<.0001
		non-IFM	$ 15,345	$ 13,556	0.88	-$ 1,789	<.0001			
	60-days (n=1123)	**IFM**	$ 20,745	$ 14,882	0.72	-$ 5,863	<.0001	0.82	-$ 3,264	0.0003
		non-IFM	$ 20,231	$ 17,632	0.87	-$ 2,599	0.0004			
	90-days (n=1045)	**IFM**	$ 25,085	$ 18,132	0.72	-$ 6,953	<.0001	0.86	-$ 2,897	0.02
		non-IFM	$ 25,156	$ 21,100	0.84	-$ 4,057	0.0001			

COPD/CHF Program 2:
For this project, we identified enrolments from both the project registry and Special Project Field 615 (n=205). Thirty-four enrollees were excluded for not meeting administrative data enrollment criteria (see Appendix 1). The project targeted individuals suitable for self-care and without cognitive impairment, criteria that could not be identified using DAD administrative databases. We were able to match 164 of 171 enrollees to similar patients in the comparator groups (historical IFM, historical non-IFM and concurrent non-IFM) (see Appendix 3). A number of standard differences were above 0.1, particularly when matching concurrent and historic patients from comparator facilities, indicating potential imbalance on these covariates, however, p-values from either chi-square, one-way ANOVA or Cochran-Armitage trend test, as appropriate, were >0.05 for all but one covariate. We included condition (COPD or CHF) in the propensity score.
Table below shows the outcomes for COPD/CHF Program 1. Many of the outcomes experienced small, but not statistically significant, reductions over time. There were insufficient cost data to report on this outcome reliably. Relative to changes over time for patients from non-IFM facilities, there were no statistically significant differences for patients from the IFM facility.

Baseline Characteristics of Matched Enrollees and Comparators for COPD CHF Program 2

COPD/CHF Program 2 (n=164)	IFM & Historic from Same Facilities				IFM & Concurrent Comparator Facilities				Concurrent & Historic Comparator Facilities			
Variable	Enrollee Mean(SD)/%	Historic Mean(SD)/%	Standard Difference	Variance Ratio	Enrollee Mean(SD)/%	Concurrent Mean(SD)/%	Standard Difference	Variance Ratio	Concurrent Mean(SD)/%	Historic Mean(SD)/%	Standard Difference	Variance Ratio
Age	77.09 ± 11.47	77.12 ± 11.34	0	1.02	77.09 ± 11.47	77.04 ± 11.63	0	0.97	77.04 ± 11.63	76.99 ± 11.56	0	1.01
Sex (Male)	69 (42.1%)	69 (42.1%)	0	1	69 (42.1%)	69 (42.1%)	0	1	69 (42.1%)	69 (42.1%)	0	1
Propensity	1.98 ± 0.79	2.00 ± 0.80	0.03	0.97	2.85 ± 0.91	2.91 ± 0.86	0.06	1.12	2.86 ± 0.95	2.92 ± 0.93	0.07	1.06
Rurality (RIO 2008)	0.51 ± 1.45	0.49 ± 1.48	0.02	0.96	0.51 ± 1.45	0.55 ± 1.73	0.02	0.7	0.55 ± 1.73	0.68 ± 1.72	0.08	1.01
CADG1 - Acute Minor	156 (95.1%)	153 (93.3%)	0.08	1.35	156 (95.1%)	159 (97.0%)	0.09	0.64	159 (97.0%)	159 (97.0%)	0	1
CADG2 - Acute Major	152 (92.7%)	149 (90.9%)	0.07	1.23	152 (92.7%)	156 (95.1%)	0.1	0.68	156 (95.1%)	154 (93.9%)	0.05	1.23
CADG3 - Likely To Recur	120 (73.2%)	116 (70.7%)	0.05	1.05	120 (73.2%)	124 (75.6%)	0.06	0.94	124 (75.6%)	133 (81.1%)	0.13	0.83
CADG4 - Asthma	51 (31.1%)	51 (31.1%)	0	1	51 (31.1%)	51 (31.1%)	0	1	51 (31.1%)	54 (32.9%)	0.04	1.03
CADG5 - Chronic Medical Unstable	150 (91.5%)	152 (92.7%)	0.05	0.87	150 (91.5%)	153 (93.3%)	0.07	0.8	153 (93.3%)	148 (90.2%)	0.11	1.41
CADG6 - Chronic Medical Stable	150 (91.5%)	148 (90.2%)	0.04	1.13	150 (91.5%)	154 (93.9%)	0.09	0.73	154 (93.9%)	153 (93.3%)	0.02	1.09
CADG7 - Chronic Specialty Stable	19 (11.6%)	22 (13.4%)	0.06	1.13	19 (11.6%)	31 (18.9%)	0.2	1.5	31 (18.9%)	38 (23.2%)	0.1	1.16
CADG8 - Eye/Dental	46 (28.0%)	44 (26.8%)	0.03	0.97	46 (28.0%)	46 (28.0%)	0	1	46 (28.0%)	40 (24.4%)	0.08	0.91
CADG9 - Chronic Specialty Unstable	49 (29.9%)	43 (26.2%)	0.08	0.92	49 (29.9%)	58 (35.4%)	0.12	1.09	58 (35.4%)	57 (34.8%)	0.01	0.99
CADG10 - Psychosocial	73 (44.5%)	74 (45.1%)	0.01	1	73 (44.5%)	76 (46.3%)	0.04	1.01	76 (46.3%)	75 (45.7%)	0.01	1
CADG11 - Preventive/ Administrative	85 (51.8%)	81 (49.4%)	0.05	1	85 (51.8%)	89 (54.3%)	0.05	0.99	89 (54.3%)	95 (57.9%)	0.07	0.98
CADG12 - Pregnancy	.	.	.	.	.	.	.	.	.	.	.	.
Income Quintile (0-20)	37 (22.6%)	32 (19.5%)	0.07	0.9	37 (22.6%)	40 (24.4%)	0.04	1.06	40 (24.4%)	42 (25.6%)	0.03	1.03
Income Quintile (20-40)	37 (22.6%)	44 (26.8%)	0.1	1.12	37 (22.6%)	35 (21.3%)	0.03	0.96	35 (21.3%)	37 (22.6%)	0.03	1.04
Income Quintile (40-60)	26 (15.9%)	25 (15.2%)	0.02	0.97	26 (15.9%)	27 (16.5%)	0.02	1.03	27 (16.5%)	22 (13.4%)	0.09	0.84
Income Quintile (60-80)	32 (19.5%)	35 (21.3%)	0.05	1.07	32 (19.5%)	30 (18.3%)	0.03	0.95	30 (18.3%)	36 (22.0%)	0.09	1.15
Income Quintile (80-100)	32 (19.5%)	28 (17.1%)	0.06	0.9	32 (19.5%)	32 (19.5%)	0	1	32 (19.5%)	27 (16.5%)	0.08	0.88
Condition (COPD)	92 (56.1%)	86 (52.4%)	0.07	1.01	92 (56.1%)	78 (47.6%)	0.17	1.01	78 (47.6%)	57 (34.8%)	0.26	0.91
Condition (CHF)	72 (43.9%)	78 (47.6%)	0.07	1.01	72 (43.9%)	86 (52.4%)	0.17	1.01	86 (52.4%)	107 (65.2%)	0.26	0.91
Number of hospital admissions 1-year prior	0.74 ± 1.16	0.59 ± 1.13	0.13	1.05	0.74 ± 1.16	0.75 ± 1.10	0.01	1.12	0.75 ± 1.10	0.70 ± 0.99	0.05	1.24
Number of ED visits 1-year prior	1.65 ± 1.95	1.40 ± 1.76	0.13	1.22	1.65 ± 1.95	1.66 ± 1.77	0.01	1.2	1.66 ± 1.77	1.68 ± 2.13	0.01	0.69

DID Outcome Model Estimates for COPD/CHF Program 2

Outcome	Time Period (sample size)	Group	Pre (Oct 2012-Sept 2014)	Post (Jan 2016-March 2018)	Relative Difference (post / pre)	Absolute Difference (post - pre)	p-value	DID (Relative)	DID (Absolute)	p-value
Mean Index Total LOS (days)	**(n=164)**	**IFM**	5.37	4.77	0.89	-0.59	0.13	0.9	-0.54	0.33
		non-IFM	5.9	5.85	0.99	-0.05	0.92			
Readmission or Death Rate	**30-days (n=164)**	**IFM**	0.23	0.2	0.86	-0.03	0.5	1.33	0.05	0.39
		non-IFM	0.24	0.16	0.65	-0.09	0.05			
	60-days (n=164)	**IFM**	0.31	0.25	0.8	-0.06	0.22	1.05	0.02	0.78
		non-IFM	0.34	0.26	0.76	-0.08	0.1			
	90-days (n=164)	**IFM**	0.36	0.3	0.85	-0.05	0.3	0.99	0	1
		non-IFM	0.38	0.33	0.86	-0.05	0.28			
ED Visit or Death Rate	**30-days (n=164)**	**IFM**	0.26	0.29	1.12	0.03	0.53	1.27	0.07	0.34
		non-IFM	0.3	0.27	0.88	-0.04	0.41			
	60-days (n=164)	**IFM**	0.35	0.38	1.07	0.02	0.64	1.19	0.07	0.36
		non-IFM	0.41	0.37	0.9	-0.04	0.37			
	90-days (n=164)	**IFM**	0.43	0.44	1.01	0.01	0.91	1.12	0.05	0.46
		non-IFM	0.51	0.46	0.9	-0.05	0.34			
Mean Total Days in Hospital	**30-days (n=151)**	**IFM**	7.06	6	0.85	-1.06	0.09	0.94	-0.38	0.63
		non-IFM	7.42	6.74	0.91	-0.68	0.31			
	60-days (n=134)	**IFM**	8.24	6.73	0.82	-1.51	0.15	0.89	-0.82	0.53
		non-IFM	8.43	7.74	0.92	-0.69	0.46			
	90-days (n=124)	**IFM**	8.53	7.15	0.84	-1.38	0.28	0.9	-0.75	0.61
		non-IFM	9.49	8.86	0.93	-0.63	0.57			

COPD/CHF Program 3

For this project, we identified enrolments from both the project registry and Special Project Field 615 (n=269). We were not able to identify comparator patients with moderate COPD as defined by the project's risk stratification algorithm (Appendix 1) because some of these criteria are not recorded in the available administrative databases. We were able to match 207 of 238 enrolments. Balance between groups was reasonable. Mean index total LOS for IFM patients decreased slightly, but this was not statistically significant. Readmission or death rate and ED visits or death were statistically significantly lower in the post relative to the pre period for patients from IFM hospitals, at 30, 60 and 90-days.

Relative to changes over time for comparator facilities, IFM facilities had no statistically significant improvements for any outcome. The sample size for this project was small and findings should be interpreted with caution.

Baseline Characteristics of Matched Enrollees and Comparators for COPD/CHF Program 3

COPD/CHF Program 3 (n=207)	IFM & Historic from Same Facilities				IFM & Concurrent Comparator Facilities				Concurrent & Historic Comparator Facilities			
Variable	Enrollee Mean(SD)/%	Historic Mean(SD)/%	Standard Difference	Variance Ratio	Enrollee Mean(SD)/%	Concurrent Mean(SD)/%	Standard Difference	Variance Ratio	Concurrent Mean(SD)/%	Historic Mean(SD)/%	Standard Difference	Variance Ratio
Age	72.94 ± 8.99	72.99 ± 8.98	0.01	1	72.94 ± 8.99	72.94 ± 9.01	0	1	72.94 ± 9.01	72.95 ± 8.97	0	1.01
Sex (Male)	94 (45.4%)	94 (45.4%)	0	1	94 (45.4%)	94 (45.4%)	0	1	94 (45.4%)	94 (45.4%)	0	1
Propensity	2.25 ± 0.48	2.27 ± 0.48	0.02	1.01	3.15 ± 0.67	3.17 ± 0.66	0.03	1.03	3.43 ± 0.75	3.52 ± 0.71	0.12	1.1
Rurality (RIO 2008)	2.00 ± 7.83	2.64 ± 8.67	0.08	0.82	2.00 ± 7.83	1.99 ± 8.28	0	0.89	1.99 ± 8.28	1.57 ± 6.96	0.05	1.42
CADG1 - Acute Minor	188 (90.8%)	196 (94.7%)	0.15	0.6	188 (90.8%)	190 (91.8%)	0.03	0.9	190 (91.8%)	194 (93.7%)	0.07	0.78
CADG2 - Acute Major	189 (91.3%)	193 (93.2%)	0.07	0.79	189 (91.3%)	189 (91.3%)	0	1	189 (91.3%)	190 (91.8%)	0.02	0.95
CADG3 - Likely To Recur	151 (72.9%)	158 (76.3%)	0.08	0.92	151 (72.9%)	150 (72.5%)	0.01	1.01	150 (72.5%)	143 (69.1%)	0.07	1.07
CADG4 - Asthma	33 (15.9%)	43 (20.8%)	0.13	1.23	33 (15.9%)	33 (15.9%)	0	1	33 (15.9%)	42 (20.3%)	0.11	1.21
CADG5 - Chronic Medical Unstable	196 (94.7%)	199 (96.1%)	0.07	0.74	196 (94.7%)	196 (94.7%)	0	1	196 (94.7%)	198 (95.7%)	0.05	0.83
CADG6 - Chronic Medical Stable	183 (88.4%)	187 (90.3%)	0.06	0.85	183 (88.4%)	186 (89.9%)	0.05	0.89	186 (89.9%)	187 (90.3%)	0.02	0.96
CADG7 - Chronic Specialty Stable	8 (3.9%)	10 (4.8%)	0.05	1.24	8 (3.9%)	10 (4.8%)	0.05	1.24	10 (4.8%)	8 (3.9%)	0.05	0.81
CADG8 - Eye/Dental	28 (13.5%)	30 (14.5%)	0.03	1.06	28 (13.5%)	31 (15.0%)	0.04	1.09	31 (15.0%)	32 (15.5%)	0.01	1.03
CADG9 - Chronic Specialty Unstable	29 (14.0%)	27 (13.0%)	0.03	0.94	29 (14.0%)	30 (14.5%)	0.01	1.03	30 (14.5%)	26 (12.6%)	0.06	0.89
CADG10 - Psychosocial	96 (46.4%)	98 (47.3%)	0.02	1	96 (46.4%)	99 (47.8%)	0.03	1	99 (47.8%)	99 (47.8%)	0	1
CADG11 - Preventive/ Administrative	84 (40.6%)	86 (41.5%)	0.02	1.01	84 (40.6%)	85 (41.1%)	0.01	1	85 (41.1%)	79 (38.2%)	0.06	0.98
CADG12 - Pregnancy	.	.	.	.	.	.	.	.	.	.	.	.
Income Quintile (0-20)	69 (33.3%)	71 (34.3%)	0.02	1.01	69 (33.3%)	77 (37.2%)	0.08	1.05	77 (37.2%)	59 (28.5%)	0.19	0.87
Income Quintile (20-40)	59 (28.5%)	59 (28.5%)	0	1	59 (28.5%)	49 (23.7%)	0.11	0.89	49 (23.7%)	43 (20.8%)	0.07	0.91
Income Quintile (40-60)	24 (11.6%)	22 (10.6%)	0.03	0.93	24 (11.6%)	28 (13.5%)	0.06	1.14	28 (13.5%)	32 (15.5%)	0.05	1.12
Income Quintile (60-80)	31 (15.0%)	35 (16.9%)	0.05	1.1	31 (15.0%)	30 (14.5%)	0.01	0.97	30 (14.5%)	44 (21.3%)	0.18	1.35
Income Quintile (80-100)	24 (11.6%)	20 (9.7%)	0.06	0.85	24 (11.6%)	23 (11.1%)	0.02	0.96	23 (11.1%)	29 (14.0%)	0.09	1.22
Condition (COPD)	151 (72.9%)	151 (72.9%)	0	1	151 (72.9%)	151 (72.9%)	0	1	151 (72.9%)	151 (72.9%)	0	1
Condition (CHF)	56 (27.1%)	56 (27.1%)	0	1	56 (27.1%)	56 (27.1%)	0	1	56 (27.1%)	56 (27.1%)	0	1
Number of hospital admissions 1-year prior	0.69 ± 1.08	0.80 ± 1.05	0.1	1.06	0.69 ± 1.08	0.66 ± 0.98	0.03	1.22	0.66 ± 0.98	0.57 ± 0.89	0.09	1.22
Number of ED visits 1-year prior	1.82 ± 2.21	1.96 ± 2.39	0.06	0.85	1.82 ± 2.21	1.81 ± 2.35	0	0.88	1.81 ± 2.35	1.53 ± 1.81	0.13	1.69

DID Outcome Model Estimates for COPD/CHF Program 3

Outcome	Time Period (sample size)	Group	Pre (Oct 2012-Sept 2014)	Post (Oct 2015-March 2018)	Relative Difference (post / pre)	Absolute Difference (post - pre)	p-value	DID (Relative)	DID (Absolute)	p-value
Mean Index Total LOS (days)	**(n=207)**	**IFM**	5.27	5.16	0.98	-0.10	0.77	1.22	1.07	0.06
		non-IFM	6.05	4.87	0.81	-1.17	0.004			
Readmission or Death Rate	**30-days (n=207)**	**IFM**	0.21	0.13	0.6	-0.08	0.02	0.81	-0.03	0.48
		non-IFM	0.19	0.14	0.75	-0.05	0.18			
	60-days (n=207)	**IFM**	0.34	0.22	0.65	-0.12	0.006	0.92	-0.04	0.5
		non-IFM	0.28	0.2	0.71	-0.08	0.05			
	90-days (n=207)	**IFM**	0.41	0.29	0.71	-0.12	0.01	0.99	-0.01	0.88
		non-IFM	0.39	0.28	0.72	-0.11	0.02			
ED Visit or Death Rate	**30-days (n=207)**	**IFM**	0.32	0.18	0.58	-0.14	0.001	0.89	-0.02	0.7
		non-IFM	0.31	0.20	0.65	-0.11	0.009			
	60-days (n=207)	**IFM**	0.45	0.31	0.68	-0.14	0.002	1.00	0	0.94
		non-IFM	0.44	0.30	0.68	-0.14	0.003			
	90-days (n=207)	**IFM**	0.54	0.42	0.78	-0.12	0.02	1.01	0	1
		non-IFM	0.52	0.40	0.78	-0.12	0.02			
Mean Total Days in Hospital	**30-days (n=187)**	**IFM**	6.03	5.52	0.91	-0.51	0.25	1.11	0.73	0.42
		non-IFM	7.2	5.96	0.83	-1.25	0.04			
	60-days (n=171)	**IFM**	7.32	6.14	0.84	-1.18	0.06	1.03	0.29	0.85
		non-IFM	7.95	6.48	0.81	-1.47	0.08			
	90-days (n=153)	**IFM**	7.74	7.03	0.91	-0.71	0.39	1.09	0.83	0.64
		non-IFM	9.38	7.84	0.84	-1.54	0.21			
Mean Total Cost	**30-days (n=207)**	**IFM**	$ 10,243	$ 11,458	1.12	$ 1,215	0.13	1.1	$ 1,022	0.4
		non-IFM	$ 11,328	$ 11,521	1.02	$ 194	0.85			
	60-days (n=198)	**IFM**	$ 13,875	$ 13,771	0.99	-$ 103	0.93	0.98	-$ 265	0.88
		non-IFM	$ 14,341	$ 14,503	1.01	$ 161	0.91			
	90-days (n=170)	**IFM**	$ 17,005	$ 15,309	0.9	-$ 1,696	0.27	0.93	-$ 1,037	0.63
		non-IFM	$ 18,425	$ 17,766	0.96	-$ 659	0.76			

UTI/Cellulitis

For this project, we identified enrolments from the project registry (n=735). Patients were admitted after either an ED visit (NACRS) or inpatient stay (DAD) for UTI/Cellulitis. A substantial portion of patients from the project registry did not have a diagnosis code for UTI or Cellulitis. For those that didn't, we linked with the homecare database (HCD) to see if they had a UTI or Cellulitis diagnosis recorded in this database subsequent to the index event. Despite this, a substantial portion of the project registry was excluded (n=93). We also used DAD, NACRS and HCD to identify comparators with a UTI or cellulitis diagnosis. For HCD, the diagnosis had to be effective within 60-days after a hospitalization or ED visit. We were not able to identify all of the enrolment criteria in the administrative data, particularly IV antibiotics (Appendix 1). We were able to match 587 of 642 enrolments. Index hospitalization or ED visit was used as a hard matching variable; only 59 (10.1%) matched IFM patients had an index hospitalization, the rest were enrolled through the ED. Balance between groups was fairly good (Appendix 6).

Table 9 shows the outcomes for CW H2H (see Appendix 13 for outcomes). Mean index total LOS decreased by a significant amount for index inpatient cases (n=59) from IFM hospitals. The statistically significant reductions in total days in hospital at 30, 60 and 90-days was driven by the index LOS of inpatient UTI/cellulitis patients. There was no significant change in readmission or death rate, but, worryingly, ED visit or death rate increased over time for patients from IFM hospitals.

The decline over time in mean index total LOS for inpatients from IFM facilities was statistically significantly greater than that for inpatients from comparator facilities. As was the decline in mean total hospital days over the bundle period (30, 60 and 90-days).

Baseline Characteristics of Matched Enrollees and Comparators for UTI/Cellulitis

UTI/Cellulitis **(n=587)**	**IFM & Historic from Same Facilities**				**IFM & Concurrent Comparator Facilities**				**Concurrent & Historic Comparator Facilities**			
Variable	**Enrollee Mean(SD)/%**	**Historic Mean(SD)/%**	**Standard Difference**	**Variance Ratio**	**Enrollee Mean(SD)/%**	**Concurrent Mean(SD)/%**	**Standard Difference**	**Variance Ratio**	**Concurrent Mean(SD)/%**	**Historic Mean(SD)/%**	**Standard Difference**	**Variance Ratio**
Age	61.60 ± 16.21	61.61 ± 16.21	0	1	61.60 ± 16.21	61.60 ± 16.22	0	1	61.60 ± 16.22	61.60 ± 16.21	0	1
Sex (Male)	326 (55.5%)	326 (55.5%)	0	1	326 (55.5%)	326 (55.5%)	0	1	326 (55.5%)	326 (55.5%)	0	1
Propensity	2.85 ± 0.67	2.87 ± 0.68	0.03	0.99	3.62 ± 0.86	3.64 ± 0.86	0.03	1.02	3.90 ± 5.45	3.84 ± 5.11	0.01	1.14
Rurality (RIO 2008)	3.42 ± 6.76	3.63 ± 7.29	0.03	0.86	3.42 ± 6.76	3.90 ± 5.45	0.08	1.54	3.88 ± 0.85	3.90 ± 0.83	0.03	1.04
CADG1 - Acute Minor	514 (87.6%)	509 (86.7%)	0.03	1.06	514 (87.6%)	523 (89.1%)	0.05	0.89	523 (89.1%)	517 (88.1%)	0.03	1.08
CADG2 - Acute Major	534 (91.0%)	520 (88.6%)	0.08	1.23	534 (91.0%)	530 (90.3%)	0.02	1.07	530 (90.3%)	526 (89.6%)	0.02	1.06
CADG3 - Likely To Recur	447 (76.1%)	424 (72.2%)	0.09	1.1	447 (76.1%)	433 (73.8%)	0.06	1.07	433 (73.8%)	435 (74.1%)	0.01	0.99
CADG4 - Asthma	63 (10.7%)	54 (9.2%)	0.05	0.87	63 (10.7%)	60 (10.2%)	0.02	0.96	60 (10.2%)	61 (10.4%)	0.01	1.01
CADG5 - Chronic Medical Unstable	312 (53.2%)	290 (49.4%)	0.08	1	312 (53.2%)	320 (54.5%)	0.03	1	320 (54.5%)	333 (56.7%)	0.04	0.99
CADG6 - Chronic Medical Stable	450 (76.7%)	456 (77.7%)	0.02	0.97	450 (76.7%)	468 (79.7%)	0.07	0.9	468 (79.7%)	471 (80.2%)	0.01	0.98
CADG7 - Chronic Specialty Stable	53 (9.0%)	36 (6.1%)	0.11	0.7	53 (9.0%)	66 (11.2%)	0.07	1.21	66 (11.2%)	73 (12.4%)	0.04	1.09
CADG8 - Eye/Dental	97 (16.5%)	111 (18.9%)	0.06	1.11	97 (16.5%)	94 (16.0%)	0.01	0.98	94 (16.0%)	99 (16.9%)	0.02	1.04
CADG9 - Chronic Specialty Unstable	114 (19.4%)	125 (21.3%)	0.05	1.07	114 (19.4%)	119 (20.3%)	0.02	1.03	119 (20.3%)	115 (19.6%)	0.02	0.97
CADG10 - Psychosocial	204 (34.8%)	192 (32.7%)	0.04	0.97	204 (34.8%)	184 (31.3%)	0.07	0.95	184 (31.3%)	168 (28.6%)	0.06	0.95
CADG11 - Preventive/ Administrative	197 (33.6%)	204 (34.8%)	0.03	1.02	197 (33.6%)	186 (31.7%)	0.04	0.97	186 (31.7%)	204 (34.8%)	0.07	1.05
CADG12 - Pregnancy	14 (2.4%)	8 (1.4%)	0.08	0.58	14 (2.4%)	9 (1.5%)	0.06	0.65	9 (1.5%)	9 (1.5%)	0	1
Income Quintile (0-20)	112 (19.1%)	98 (16.7%)	0.06	0.9	112 (19.1%)	110 (18.7%)	0.01	0.99	110 (18.7%)	94 (16.0%)	0.07	0.88
Income Quintile (20-40)	161 (27.4%)	155 (26.4%)	0.02	0.98	161 (27.4%)	162 (27.6%)	0	1	162 (27.6%)	151 (25.7%)	0.04	0.96
Income Quintile (40-60)	176 (30.0%)	187 (31.9%)	0.04	1.03	176 (30.0%)	172 (29.3%)	0.01	0.99	172 (29.3%)	174 (29.6%)	0.01	1.01
Income Quintile (60-80)	91 (15.5%)	95 (16.2%)	0.02	1.04	91 (15.5%)	102 (17.4%)	0.05	1.1	102 (17.4%)	115 (19.6%)	0.06	1.1
Income Quintile (80-100)	47 (8.0%)	52 (8.9%)	0.03	1.1	47 (8.0%)	41 (7.0%)	0.04	0.88	41 (7.0%)	53 (9.0%)	0.08	1.26
Number of hospital admissions 1-year prior	0.25 ± 0.66	0.30 ± 0.80	0.07	0.68	0.25 ± 0.66	0.27 ± 0.65	0.03	1.02	0.27 ± 0.65	0.31 ± 0.79	0.05	0.68
Number of ED visits 1-year prior	1.38 ± 2.07	1.08 ± 2.05	0.14	1.02	1.38 ± 2.07	1.28 ± 1.95	0.05	1.13	1.28 ± 1.95	1.21 ± 1.94	0.04	1.01
Index Hospital Admission	59 (10.1%)	59 (10.1%)	0	1	59 (10.1%)	59 (10.1%)	0	1	59 (10.1%)	59 (10.1%)	0	1

DID Model Estimates for UTI/Cellulitis

Outcome	Time Period (sample size)	Group	Pre (Oct 2012-Sept 2014)	Post (Nov 2015-March 2018)	Relative Difference (post / pre)	Absolute Difference (post - pre)	p-value	DID (Relative)	DID (Absolute)	p-value
Mean Index Total LOS (days)	**(n=59)**	**IFM**	10.66	3.17	0.3	-7.49	<.0001	0.32	-6.8	<.0001
		non-IFM	10.14	9.44	0.93	-0.69	0.56			
Readmission or Death Rate	**30-days (n=587)**	**IFM**	0.11	0.09	0.79	-0.02	0.16	0.77	-0.03	0.28
		non-IFM	0.09	0.10	1.02	0.00	0.92			
	60-days (n=587)	**IFM**	0.15	0.12	0.79	-0.03	0.09	0.75	-0.04	0.15
		non-IFM	0.13	0.14	1.05	0.01	0.73			
	90-days (n=587)	**IFM**	0.18	0.14	0.83	-0.03	0.14	0.74	-0.05	0.1
		non-IFM	0.15	0.17	1.11	0.02	0.4			
ED Visit or Death Rate	**30-days (n=587)**	**IFM**	0.36	0.42	1.17	0.06	0.03	1.12	0.05	0.24
		non-IFM	0.35	0.37	1.04	0.02	0.59			
	60-days (n=587)	**IFM**	0.42	0.47	1.13	0.05	0.06	1.07	0.03	0.41
		non-IFM	0.4	0.42	1.06	0.02	0.43			
	90-days (n=587)	**IFM**	0.45	0.51	1.13	0.06	0.05	1.06	0.03	0.47
		non-IFM	0.44	0.47	1.07	0.03	0.31			
Mean Total Days in Hospital	**30-days (n=565)**	**IFM**	1.47	0.73	0.5	-0.74	<.0001	0.54	-0.63	0.006
		non-IFM	1.39	1.28	0.92	-0.11	0.55			
	60-days (n=552)	**IFM**	1.81	0.93	0.51	-0.89	0.0002	0.53	-0.83	0.008
		non-IFM	1.7	1.64	0.97	-0.06	0.84			
	90-days (n=542)	**IFM**	1.99	1.17	0.59	-0.81	0.009	0.57	-0.89	0.03
		non-IFM	1.82	1.9	1.04	0.07	0.82			
Mean Total Cost	**30-days (n=587)**	**IFM**	$ 4,826	$ 4,418	0.92	-$ 408	0.38	0.96	-$ 210	0.78
		non-IFM	$ 4,483	$ 4,285	0.96	-$ 198	0.66			
	60-days (n=587)	**IFM**	$ 6,445	$ 5,728	0.89	-$ 718	0.31	0.9	-$ 669	0.52
		non-IFM	$ 6,318	$ 6,269	0.99	-$ 49	0.95			
	90-days (n=587)	**IFM**	$ 7,711	$ 6,925	0.9	-$ 786	0.39	0.9	-$ 796	0.53
		non-IFM	$ 7,815	$ 7,826	1.00	$ 11	0.99			

Stroke

For this project, we identified enrolments from both the project registry and Special Project Field 615 (n=649). A substantial portion of the identified enrolments were excluded (n=136), for not meeting administrative data enrollment criteria (see Appendix 1). We were able to match 437 of 513 enrolments. Balance between groups was fairly good (see Appendix 7). We included tPA, discharge destination (inpatient rehab or home) and intervention (EVT) in the propensity score.

Table 10 shows the outcomes for TC/C OCOT (see Appendix 14 for additional outcomes). Mean index total LOS decreased for patients from IFM hospitals ($p<0.001$), but the proportion with ALC increased significantly. Mean total days in hospital and mean total costs were also significantly lower in the post period as compared to the pre period. Readmission or death rate and ED visit or death rate decreased over time for patients from the IFM hospitals, but did not achieve statistical significance.

Relative to changes over time for patients from comparator facilities, nearly all outcomes improved (decreased) but did not achieve statistical significance ($p >0.05$).

Baseline Characteristics of Matched Enrollees and Comparators for Stroke

Stroke (n=437)	IFM & Historic from Same Facilities				IFM & Concurrent Comparator Facilities				Concurrent & Historic Comparator Facilities			
Variable	Enrollee Mean(SD)/%	Historic Mean(SD)/%	Standard Difference	Variance Ratio	Enrollee Mean(SD)/%	Concurrent Mean(SD)/%	Standard Difference	Variance Ratio	Concurrent Mean(SD)/%	Historic Mean(SD)/%	Standard Difference	Variance Ratio
Age	73.80 ± 12.36	73.78 ± 12.30	0	1.01	73.80 ± 12.36	73.77 ± 12.37	0	1	73.77 ± 12.37	73.76 ± 12.35	0	1
Sex (Male)	240 (54.9%)	240 (54.9%)	0	1	240 (54.9%)	240 (54.9%)	0	1	240 (54.9%)	240 (54.9%)	0	1
Propensity	0.70 ± 0.67	0.72 ± 0.65	0.02	1.04	2.02 ± 0.78	2.07 ± 0.74	0.06	1.11	1.84 ± 0.76	1.88 ± 0.73	0.06	1.08
Rurality (RIO 2008)	0.88 ± 3.45	1.46 ± 6.92	0.11	0.25	0.88 ± 3.45	0.96 ± 2.79	0.02	1.53	0.96 ± 2.79	1.00 ± 2.88	0.02	0.94
CADG1 - Acute Minor	356 (81.5%)	360 (82.4%)	0.02	0.96	356 (81.5%)	344 (78.7%)	0.07	1.11	344 (78.7%)	343 (78.5%)	0.01	1.01
CADG2 - Acute Major	385 (88.1%)	395 (90.4%)	0.07	0.83	385 (88.1%)	380 (87.0%)	0.03	1.08	380 (87.0%)	382 (87.4%)	0.01	0.97
CADG3 - Likely To Recur	300 (68.6%)	298 (68.2%)	0.01	1.01	300 (68.6%)	289 (66.1%)	0.05	1.04	289 (66.1%)	291 (66.6%)	0.01	0.99
CADG4 - Asthma	20 (4.6%)	20 (4.6%)	0	1	20 (4.6%)	16 (3.7%)	0.05	0.81	16 (3.7%)	17 (3.9%)	0.01	1.06
CADG5 - Chronic Medical Unstable	338 (77.3%)	336 (76.9%)	0.01	1.01	338 (77.3%)	346 (79.2%)	0.04	0.94	346 (79.2%)	347 (79.4%)	0.01	0.99
CADG6 - Chronic Medical Stable	361 (82.6%)	369 (84.4%)	0.05	0.91	361 (82.6%)	361 (82.6%)	0	1	361 (82.6%)	358 (81.9%)	0.02	1.03
CADG7 - Chronic Specialty Stable	38 (8.7%)	44 (10.1%)	0.05	1.14	38 (8.7%)	37 (8.5%)	0.01	0.98	37 (8.5%)	37 (8.5%)	0	1
CADG8 - Eye/Dental	85 (19.5%)	93 (21.3%)	0.05	1.07	85 (19.5%)	91 (20.8%)	0.03	1.05	91 (20.8%)	91 (20.8%)	0	1
CADG9 - Chronic Specialty Unstable	115 (26.3%)	117 (26.8%)	0.01	1.01	115 (26.3%)	97 (22.2%)	0.1	0.89	97 (22.2%)	93 (21.3%)	0.02	0.97
CADG10 - Psychosocial	165 (37.8%)	157 (35.9%)	0.04	0.98	165 (37.8%)	158 (36.2%)	0.03	0.98	158 (36.2%)	162 (37.1%)	0.02	1.01
CADG11 - Preventive/ Administrative	152 (34.8%)	151 (34.6%)	0	1	152 (34.8%)	163 (37.3%)	0.05	1.03	163 (37.3%)	160 (36.6%)	0.01	0.99
CADG12 - Pregnancy	.	.	.	.	.	.	.	.	.	.	.	.
Income Quintile (0-20)	87 (19.9%)	80 (18.3%)	0.04	0.94	87 (19.9%)	89 (20.4%)	0.01	1.02	89 (20.4%)	79 (18.1%)	0.06	0.91
Income Quintile (20-40)	95 (21.7%)	82 (18.8%)	0.07	0.9	95 (21.7%)	102 (23.3%)	0.04	1.05	102 (23.3%)	109 (24.9%)	0.04	1.05
Income Quintile (40-60)	68 (15.6%)	72 (16.5%)	0.02	1.05	68 (15.6%)	67 (15.3%)	0.01	0.99	67 (15.3%)	68 (15.6%)	0.01	1.01
Income Quintile (60-80)	76 (17.4%)	79 (18.1%)	0.02	1.03	76 (17.4%)	76 (17.4%)	0	1	76 (17.4%)	87 (19.9%)	0.06	1.11
Income Quintile (80-100)	111 (25.4%)	124 (28.4%)	0.07	1.07	111 (25.4%)	103 (23.6%)	0.04	0.95	103 (23.6%)	94 (21.5%)	0.05	0.94
Discharged Home	309 (70.7%)	300 (68.6%)	0.04	1.04	309 (70.7%)	310 (70.9%)	0.01	1	310 (70.9%)	320 (73.2%)	0.05	0.95
Discharged to Inpatient Rehab	.	.	.	.	0 (0.0%)	*1 - 5	0.07	.	*1 - 5	*1 - 5	0.07	2.99
Number of hospital admissions 1-year prior	0.29 ± 0.70	0.27 ± 0.77	0.03	0.83	0.29 ± 0.70	0.31 ± 0.69	0.02	1.02	0.31 ± 0.69	0.30 ± 0.65	0.01	1.14
Number of ED visits 1-year prior	0.98 ± 1.60	0.98 ± 1.71	0	0.88	0.98 ± 1.60	0.97 ± 1.36	0.01	1.38	0.97 ± 1.36	1.04 ± 1.53	0.04	0.79
Administered tPA	48 (11.0%)	50 (11.4%)	0.01	1.04	48 (11.0%)	50 (11.4%)	0.01	1.04	50 (11.4%)	59 (13.5%)	0.06	1.15

DID Model Estimates for Stroke

Outcome	Time Period (sample size)	Group	Pre (Oct 2012-Sept 2014)	Post (Nov 2015-March 2018)	Relative Difference (post / pre)	Absolute Difference (post - pre)	p-value	DID (Relative)	DID (Absolute)	p-value
Mean Index Total LOS (days)	**(n=437)**	**IFM**	6.17	4.98	0.81	-1.19	0.0003	0.9	-0.5	0.19
		non-IFM	6.68	5.99	0.9	-0.69	0.06			
Readmission or Death Rate	**30-days (n=437)**	**IFM**	0.12	0.1	0.85	-0.02	0.4	0.67	-0.04	0.14
		non-IFM	0.09	0.11	1.26	0.02	0.24			
	60-days (n=437)	**IFM**	0.17	0.13	0.75	-0.04	0.08	0.69	-0.05	0.11
		non-IFM	0.14	0.15	1.08	0.01	0.62			
	90-days (n=437)	**IFM**	0.21	0.17	0.8	-0.04	0.13	0.79	-0.04	0.25
		non-IFM	0.18	0.18	1.01	0	0.93			
ED Visit or Death Rate	**30-days (n=437)**	**IFM**	0.19	0.17	0.9	-0.02	0.49	0.67	-0.07	0.07
		non-IFM	0.14	0.19	1.34	0.05	0.05			
	60-days (n=437)	**IFM**	0.28	0.24	0.87	-0.04	0.23	0.73	-0.08	0.07
		non-IFM	0.23	0.27	1.19	0.04	0.13			
	90-days (n=437)	**IFM**	0.34	0.29	0.87	-0.04	0.18	0.81	-0.07	0.16
		non-IFM	0.3	0.32	1.08	0.02	0.45			
Mean Total Days in Hospital	**30-days (n=403)**	**IFM**	6.49	5.49	0.85	-1.00	0.008	0.94	-0.27	0.49
		non-IFM	7.07	6.34	0.90	-0.73	0.07			
	60-days (n=377)	**IFM**	6.99	5.72	0.82	-1.27	0.005	0.9	-0.58	0.31
		non-IFM	7.32	6.62	0.91	-0.69	0.17			
	90-days (n=362)	**IFM**	7.26	6.09	0.84	-1.17	0.03	0.88	-0.85	0.26
		non-IFM	7.14	6.83	0.96	-0.31	0.56			
Mean Total Cost	**30-days (n=365)**	**IFM**	$ 17,725	$ 12,886	0.73	-$ 4,839	<.0001	0.87	-$ 1,762	0.12
		non-IFM	$ 18,520	$ 15,444	0.83	-$ 3,077	0.005			
	60-days (n=344)	**IFM**	$ 21,547	$ 15,232	0.71	-$ 6,315	<.0001	0.86	-$ 2,272	0.12
		non-IFM	$ 22,235	$ 18,192	0.82	-$ 4,043	0.005			
	90-days (n=316)	**IFM**	$ 24,261	$ 17,046	0.7	-$ 7,215	<.0001	0.84	-$ 3,219	0.09
		non-IFM	$ 24,357	$ 20,361	0.84	-$ 3,996	0.02			

Program 6: Cardiac Surgery

For this project, we identified enrolments from both the project registry and Special Project Field 615 (n=2,070). A portion of the identified enrolments were excluded (n=145), for not meeting administrative data enrollment criteria (see Appendix 1). We were able to match 1,636 of 1,925 enrolments and the balance between groups was very good (see Appendix 8). We included admission category (urgent or elective) and surgery type (valve, CABG/valve, CABG, other cardiac) in the propensity score.

The table below shows the outcomes for Mean index total LOS decreased significantly over time for patients from the IFM facility, as did post-operative LOS. For patients from the IFM facility, 30-day readmission or death rate and ED visit or death rate was significantly lower in the post relative to the pre-period, but there was no difference at 60 or 90-days ($p > 0.05$) .

Relative to changes over time for non-IFM facilities, the IFM facilities had significantly larger decreases in post-operative LOS, lower 30- and 60-day ED visits or death rates and lower readmission or death rate within 30-days. Patients from the IFM hospital had a $1,997 greater reduction in mean total costs (30-day) and $2,391 at 90-days relative to those from the non-IFM facilities.

Baseline Characteristics of Matched Enrollees and Comparators for cardiac surgery

PPATH (n=1,636)	IFM & Historic from Same Facilities				IFM & Concurrent Comparator Facilities				Concurrent & Historic Comparator Facilities			
Variable	Enrollee Mean(SD)/%	Historic Mean(SD)/%	Standard Difference	Variance Ratio	Enrollee Mean(SD)/%	Concurrent Mean(SD)/%	Standard Difference	Variance Ratio	Concurrent Mean(SD)/%	Historic Mean(SD)/%	Standard Difference	Variance Ratio
Age	65.29 ± 9.43	65.31 ± 9.41	0	1	65.29 ± 9.43	65.29 ± 9.42	0	1	65.29 ± 9.42	65.29 ± 9.43	0	1
Sex (Male)	1,322 (80.8%)	1,322 (80.8%)	0	1	1,322 (80.8%)	1,322 (80.8%)	0	1	1,322 (80.8%)	1,322 (80.8%)	0	1
Propensity	0.26 ± 0.37	0.27 ± 0.37	0.01	1	1.28 ± 0.76	1.36 ± 0.74	0.1	1.06	1.64 ± 0.71	1.70 ± 0.69	0.09	1.06
Rurality (RIO 2008)	1.66 ± 3.00	1.70 ± 3.28	0.01	0.83	1.66 ± 3.00	1.68 ± 3.35	0.01	0.8	1.68 ± 3.35	1.75 ± 3.44	0.02	0.95
CADG1 - Acute Minor	1,325 (81.0%)	1,333 (81.5%)	0.01	0.98	1,325 (81.0%)	1,314 (80.3%)	0.02	1.03	1,314 (80.3%)	1,318 (80.6%)	0.01	0.99
CADG2 - Acute Major	1,514 (92.5%)	1,506 (92.1%)	0.02	1.06	1,514 (92.5%)	1,528 (93.4%)	0.03	0.89	1,528 (93.4%)	1,531 (93.6%)	0.01	0.97
CADG3 - Likely To Recur	1,070 (65.4%)	1,054 (64.4%)	0.02	1.01	1,070 (65.4%)	1,046 (63.9%)	0.03	1.02	1,046 (63.9%)	1,060 (64.8%)	0.02	0.99
CADG4 - Asthma	97 (5.9%)	96 (5.9%)	0	0.99	97 (5.9%)	99 (6.1%)	0.01	1.02	99 (6.1%)	84 (5.1%)	0.04	0.86
CADG5 - Chronic Medical Unstable	1,510 (92.3%)	1,502 (91.8%)	0.02	1.06	1,510 (92.3%)	1,539 (94.1%)	0.07	0.78	1,539 (94.1%)	1,533 (93.7%)	0.02	1.06
CADG6 - Chronic Medical Stable	1,404 (85.8%)	1,410 (86.2%)	0.01	0.98	1,404 (85.8%)	1,401 (85.6%)	0.01	1.01	1,401 (85.6%)	1,391 (85.0%)	0.02	1.04
CADG7 - Chronic Specialty Stable	101 (6.2%)	90 (5.5%)	0.03	0.9	101 (6.2%)	105 (6.4%)	0.01	1.04	105 (6.4%)	108 (6.6%)	0.01	1.03
CADG8 - Eye/Dental	259 (15.8%)	255 (15.6%)	0.01	0.99	259 (15.8%)	216 (13.2%)	0.07	0.86	216 (13.2%)	219 (13.4%)	0.01	1.01
CADG9 - Chronic Specialty Unstable	296 (18.1%)	285 (17.4%)	0.02	0.97	296 (18.1%)	288 (17.6%)	0.01	0.98	288 (17.6%)	267 (16.3%)	0.03	0.94
CADG10 - Psychosocial	502 (30.7%)	496 (30.3%)	0.01	0.99	502 (30.7%)	488 (29.8%)	0.02	0.98	488 (29.8%)	510 (31.2%)	0.03	1.03
CADG11 - Preventive/ Administrative	539 (32.9%)	551 (33.7%)	0.02	1.01	539 (32.9%)	519 (31.7%)	0.03	0.98	519 (31.7%)	564 (34.5%)	0.06	1.04
CADG12 - Pregnancy	*1 - 5	*1 - 5	0	1	*1 - 5	*1 - 5	0	1	*1 - 5	0 (0.0%)	0.03	0
Income Quintile (0-20)	186 (11.4%)	213 (13.0%)	0.05	1.12	186 (11.4%)	209 (12.8%)	0.04	1.11	209 (12.8%)	236 (14.4%)	0.05	1.11
Income Quintile (20-40)	282 (17.2%)	271 (16.6%)	0.02	0.97	282 (17.2%)	323 (19.7%)	0.06	1.11	323 (19.7%)	348 (21.3%)	0.04	1.06
Income Quintile (40-60)	390 (23.8%)	406 (24.8%)	0.02	1.03	390 (23.8%)	386 (23.6%)	0.01	0.99	386 (23.6%)	366 (22.4%)	0.03	0.96
Income Quintile (60-80)	435 (26.6%)	419 (25.6%)	0.02	0.98	435 (26.6%)	389 (23.8%)	0.06	0.93	389 (23.8%)	367 (22.4%)	0.03	0.96
Income Quintile (80-100)	343 (21.0%)	327 (20.0%)	0.02	0.97	343 (21.0%)	329 (20.1%)	0.02	0.97	329 (20.1%)	319 (19.5%)	0.02	0.98
Urgent Procedure	1,017 (62.2%)	1,022 (62.5%)	0.01	1	1,017 (62.2%)	1,008 (61.6%)	0.01	1.01	1,008 (61.6%)	1,001 (61.2%)	0.01	1
Elective Procedure	619 (37.8%)	614 (37.5%)	0.01	1	619 (37.8%)	628 (38.4%)	0.01	1.01	628 (38.4%)	635 (38.8%)	0.01	1
Surgery Type (Valve)	84 (5.1%)	93 (5.7%)	0.02	1.1	84 (5.1%)	92 (5.6%)	0.02	1.09	92 (5.6%)	99 (6.1%)	0.02	1.07
Surgery Type (CABG/Valve)	75 (4.6%)	72 (4.4%)	0.01	0.96	75 (4.6%)	86 (5.3%)	0.03	1.14	86 (5.3%)	83 (5.1%)	0.01	0.97
Surgery Type (CABG)	1,341 (82.0%)	1,336 (81.7%)	0.01	1.01	1,341 (82.0%)	1,327 (81.1%)	0.02	1.04	1,327 (81.1%)	1,326 (81.1%)	0	1

Surgery Type (Other	136 (8.3%)	135 (8.3%)	0	0.99	136 (8.3%)	131 (8.0%)	0.01	0.97	131 (8.0%)	128 (7.8%)	0.01	0.98
Number of hospital admissions 1-year prior	0.24 ± 0.58	0.24 ± 0.55	0	1.08	0.24 ± 0.58	0.27 ± 0.57	0.05	1.01	0.27 ± 0.57	0.27 ± 0.59	0	0.93
Number of ED visits 1-year prior	0.84 ± 1.16	0.83 ± 1.26	0.01	0.85	0.84 ± 1.16	0.86 ± 1.11	0.01	1.11	0.86 ± 1.11	0.87 ± 1.28	0.01	0.75

DID Model Estimates for Cardiac Surgery

Outcome	Time Period (sample size)	Group	Pre (Oct 2012-Sept 2014)	Post (Feb 2016-March 2018)	Relative Difference (post / pre)	Absolute Difference (post - pre)	p-value	DID (Relative)	DID (Absolute)	p-value
Mean Index Total LOS (days)	**(n=1636)**	**IFM**	8.7	8.21	0.94	-0.49	0.003	0.96	-0.39	0.08
		non-IFM	8.41	8.32	0.99	-0.10	0.53			
Mean Post-Operative LOS (days)	**(n=1636)**	**IFM**	6.97	6.21	0.89	-0.76	<.0001	0.89	-0.79	<.0001
		non-IFM	6.67	6.7	1.00	0.03	0.84			
Readmission or Death Rate	**30-days (n=1636)**	**IFM**	0.10	0.08	0.78	-0.02	0.03	0.73	-0.03	0.05
		non-IFM	0.09	0.09	1.08	0.01	0.5			
	60-days (n=1636)	**IFM**	0.12	0.11	0.87	-0.02	0.14	0.81	-0.03	0.11
		non-IFM	0.11	0.12	1.08	0.01	0.45			
	90-days (n=1636)	**IFM**	0.14	0.13	0.88	-0.02	0.15	0.83	-0.02	0.15
		non-IFM	0.13	0.14	1.05	0.01	0.55			
ED Visit or Death Rate	**30-days (n=1636)**	**IFM**	0.23	0.19	0.82	-0.04	0.003	0.78	-0.05	0.01
		non-IFM	0.23	0.24	1.05	0.01	0.48			
	60-days (n=1636)	**IFM**	0.29	0.26	0.90	-0.03	0.07	0.85	-0.05	0.04
		non-IFM	0.29	0.30	1.06	0.02	0.3			
	90-days (n=1636)	**IFM**	0.32	0.31	0.97	-0.01	0.6	0.91	-0.03	0.18
		non-IFM	0.32	0.34	1.07	0.02	0.17			
Mean Total Days in Hospital	**30-days (n=1621)**	**IFM**	9.24	8.68	0.94	-0.56	0.002	0.95	-0.51	0.05
		non-IFM	8.84	8.78	0.99	-0.05	0.76			
	60-days (n=1608)	**IFM**	9.42	8.94	0.95	-0.47	0.02	0.95	-0.51	0.07
		non-IFM	9.02	9.06	1.00	0.04	0.83			
	90-days (n=1604)	**IFM**	9.57	9.13	0.95	-0.44	0.05	0.94	-0.57	0.07
		non-IFM	9.18	9.31	1.01	0.13	0.55			
Mean Total Cost	**30-days (n=1494)**	**IFM**	$ 33,426	$ 31,228	0.93	-$ 2,198	<.0001	0.94	-$ 1,997	0.003
		non-IFM	$ 31,283	$ 31,082	0.99	-$ 200	0.68			
	60-days (n=1365)	**IFM**	$ 34,597	$ 32,447	0.94	-$ 2,150	<.0001	0.93	-$ 2,293	0.003
		non-IFM	$ 32,485	$ 32,627	1.00	$ 142	0.8			

90-days (n=1271)	**IFM**	$ 35,495	$ 33,320	0.94	-$ 2,175	0.0001	0.93	-$ 2,391	0.006
	non-IFM	$ 33,563	$ 33,779	1.01	$ 216	0.74			