Integrated Comprehensive Care Programme in Ontario, Canada

Case study

Walter P Wodchis and Laleh Rashidian
The Ontario Integrated Comprehensive Care programme in Canada
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## Abbreviations

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<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tr>
<td>CADGs</td>
<td>Collapsed Aggregated Diagnosis Groups</td>
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<tr>
<td>CCAC</td>
<td>Community Care Access Centre</td>
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<tr>
<td>CHF</td>
<td>congestive heart failure</td>
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<tr>
<td>COPD</td>
<td>chronic obstructive pulmonary disease</td>
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<td>ICC</td>
<td>Integrated Comprehensive Care</td>
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<tr>
<td>IFM</td>
<td>integrated funding model</td>
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<tr>
<td>LHIN</td>
<td>Local Health Integration Network</td>
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<td>QBP</td>
<td>quality-based procedure</td>
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Executive summary

The Integrated Comprehensive Care (ICC) project in Ontario, Canada, began operating in one hospital in 2012. In 2015, the pilot was expanded to version 2.0, with the participation of nine hospitals in one regional Local Health Integration Network that has a population of more than 1.4 million residents. Those nine hospitals represent about 10% of all Ontario hospital volume. ICC 2.0 uses a bundled payment to reimburse for an integrated episode of care inclusive of acute and postacute care for patients admitted to hospital with congestive heart failure (CHF) or chronic obstructive pulmonary disease (COPD). Between October 2015 and March 2018, an average of 100 patients per month voluntarily enrolled in the programme, representing 44% of all eligible individuals (i.e. patients admitted to hospitals for COPD or CHF). The programme is ongoing, and the proportion of patients enrolled continues to be a little less than 50% of all eligible individuals.

The goal of ICC 2.0 is for patients to experience one consistent team delivering care along an integrated care pathway. As part of the programme, a single integrated payment is shared between the hospital and the home care provider for the episode of care for which the patient was admitted to hospital. Prior to 2012 and implementation of the ICC project, the Regional Health Authority held contracts separately for hospitals and several postacute home care providers, and the care pathway was not coordinated.

This report used key informant interviews and document analysis to understand the purpose, approach, effectiveness and key enabling factors for ICC 2.0. Stakeholders (i.e. senior decision-makers, managers and clinicians) highlighted the fact that the Ministry of Health and Long-Term Care allowed them to implement programmes that were sensitive to their local context. The financial stability and sustainability of the model were also essential. In implementing ICC 2.0, the Ministry provided assurances that total organizational budgets would not be adversely affected. The opportunities to further spread and scale the programme exist, but several factors must be considered, including the local context, providers and the payment environment, as well as the choice of conditions that are focused on. Other nonmedical determinants of health and outcomes must also be addressed. These may include transportation, food security and even housing.

An independent external evaluation completed by the University of Toronto in 2019 reported that hospitals participating in ICC 2.0 reduced their mean index total length of stay by 1.3 days more than comparators. Those enrolled in the programme also had statistically significant greater reductions in rates of all-cause emergency
department visits and all-cause readmission or death at 60 days after discharge relative to comparators. For the 60-day bundle period, the total reduction in costs to the system over time was 5863 Canadian dollars (Can$) (US$ 4859) per episode, which is Can$ 3264 (US$ 2705) greater for the programme relative to comparators. Because the data for this study are largely based on administrative data that lack clinical detail regarding disease severity across population groups, differences in clinical severity between the intervention and comparator populations that may have affected costs cannot be ruled out. Moreover, the analyses do not capture gaps in follow up, functional decline and patients’ experiences of care.

The sharing of information across health care providers and the use of a single home-care provider for all enrolled patients were essential enabling factors for ICC 2.0. Additional key enabling factors included ensuring clinicians are engaged with the programme so their concerns were addressed and building trust and setting up a strong infrastructure for information technology. These factors enabled hospitals to discharge patients earlier with greater confidence that the hospital could support home care providers in the community, thus shortening the length of stay in hospital and reducing readmissions to hospital, thereby reducing the total number of acute care days and creating cost savings.

This case study provided information to the WHO-OECD publication, *Purchasing for quality chronic care: summary report*. 
Programme overview
Health care costs are rising in most countries faster than the rate of economic growth. This presents a challenge to health systems to try to contain costs. In many countries, the prevalence of noncommunicable diseases, including cardiac (e.g. congestive heart failure [CHF]) and pulmonary (e.g. chronic obstructive pulmonary disease [COPD]) conditions, is increasing the need for health care services. People with these conditions require care from multiple health care providers, including those in primary care, specialist care and, too frequently, emergency and acute hospital care. Models of integrated health and social care are generally designed to combat the fragmentation of service delivery and may help curb rising costs in the health care system by bundling services and establishing and sustaining interprofessional and interorganizational collaboration.

The Ministry of Health and Long-Term Care in the Canadian province of Ontario has served as a catalyst for policy initiatives supporting integrated care. In 2015, the Ministry issued a call for expressions of interest from the health system – including hospitals, regional home care authorities, direct service home care providers, physicians and others – to participate in an initiative to develop an integrated funding model (IFM). The goal of the IFM was to test innovative approaches to integrate care and funding during a patient’s episode of care, beginning in acute care and including home or community care after discharge (1).

The framing of the IFM allowed organizations to determine their clinical focus and the specific set of services that a patient would receive during an episode of care across acute and postacute providers for a fixed period per episode. Payments would be made to a lead fundholder organization for the entire episode of care for each patient enrolled in the programme. The criteria for selecting target populations were that they should include patients with conditions that require complex and ongoing care or conditions that have high rates of hospital admissions, emergency department visits or use of other health care services. The reasoning was that these conditions put a high burden on the health system, and these patients would likely benefit from more coordination in care delivery.

Among more than 40 applicant groups for the IFM initiative, the Ministry selected the 6 deemed most ready to implement an integrated care pathway, each comprising multiple partners at the hospital and community levels, to provide bundled care within an IFM. One of these was the Integrated Comprehensive Care (ICC) project version 2.0 in the Hamilton Niagara Haldimand Brant region in Ontario, Canada. The ICC 2.0 programme specifically focuses on patients with COPD or CHF who have been discharged from acute care with home care support. We report on ICC 2.0 because it focuses on managing patients with a chronic illness using a bundled
payment model and because the model has been sustained and
grown for more than 10 years.

Of the other programmes considered for a case study, one focused
on stroke, two on COPD and CHF, and one on admissions to
emergency departments. Compared with ICC 2.0, these four
programmes covered more complex care pathways (i.e. stroke), had
more stringent eligibility requirements (e.g. limited to moderate
severity COPD or CHF) or less specifically targeted populations (i.e.
admissions to emergency departments). A fifth programme focused
on elective cardiac surgery and achieved a high degree of coverage,
reaching more than 90% penetration, with similar system savings as
ICC 2.0. This fifth programme has also been sustained and has
motivated the Ministry to begin provincial, system-wide
implementation of bundled care for planned surgical procedures,
beginning with hip and knee replacement surgeries. However, this
latter programme provides evidence that is largely already well
documented.

ICC 2.0 began operating in 2015, extending and expanding the
initial ICC programme, first implemented in one hospital system
within the same region in 2012. The original ICC project introduced
a new process of care, directly integrating hospital and community
care for selected patients. It provided an opportunity for patients to
transition to community care at an earlier time, since hospital
service providers had confidence in the ability of the health care
team to care for patients with complex needs in the patients’ homes.

The goals of ICC 2.0 are threefold:

(i) to improve the efficiency of the health care system by
integrating resources across the continuum of care;

(ii) to inform policy by implementing ICC at the regional,
multihospital scale;

(iii) to fully engage key stakeholders (e.g. physicians) as well as
patients and family members in the ICC 2.0 model.

ICC 2.0 was founded on a number of principles, the first of which
was that integrated funding supports the integrated clinical model.
Others include sharing accountability; ensuring transparency in the
use of resources, expenditures and services; and creating a shared
fund from revenues previously received by individual organizations,
which are then reallocated across the programme’s partners based
on a new funding algorithm that follows the patient.

This case study used key informant interviews and document
analysis to understand the purpose, approach, effectiveness and key
enabling factors for ICC 2.0.
1.1 Why choose these diseases?

The IFM pilot programme allowed hospitals to select the health conditions for which they would provide bundled care. CHF and COPD were selected since they are two of the costliest chronic conditions in Canada and pose major public health concerns. For both CHF and COPD, hospitalizations resulting from acute exacerbations are a significant driver of health care costs. A lack of care coordination across sectors and the challenges associated with accessing community-based care following discharge have been suggested as drivers of hospitalization and readmissions within 30 days for patients with chronic conditions such as COPD and CHF.

Furthermore, these conditions represent quality-based procedures (QBPs), which were already paid for on a case basis (i.e. volume × price) for hospital care (2, 3). There are currently seven QBPs in Ontario for which clinical standards, primarily for acute care, have been published (4). These are useful facilitating and enabling factors for implementing evidence-based care for CHF and COPD.

1.2 Health care context in Ontario

In Ontario, hospitals are all not-for-profit, independent organizations. Ontario hospitals have received global budget funding since the 1990s; previously they were paid based on the actual costs incurred. A global budget funding mechanism provides a fixed amount of money to health care providers to cover the cost of delivering services to all presenting patients during a certain period of time. It allows the health care system to control costs and reduce growth in spending.

In mid-2012, a hospital funding reform plan was introduced that changed the formula for hospitals. The long-term goal is to improve the quality of health care and reward providers that achieve better patient outcomes by adhering to evidence-based quality standards. The model also aims to align health care funding with the needs of patients by adjusting payments so they are based on area-specific utilization rates (i.e. as a proxy for need) and on the changing demographics of patients seen by the provider (4, 5).

This reform plan anticipated that by 2014, 30% of hospital funding would be received through a global budget, with an additional 30% being provided through volume-based payments and the remaining 40% funded through a population-based model, namely, the Health-Based Allocation Model (6). The global budget provides a fixed, base payment to hospitals, ensuring stability in funding. Volume-based payments focus on the overall volume of services
Programme overview

provided and are applied across a range of conditions associated with high-volume care, such as scheduled orthopaedic, cancer and cardiac surgery, as well as stroke, CHF and COPD. The Ministry of Health and Long-term Care in Ontario also produces clinical handbooks, based on guidelines and reviews of evidence-based care, for acute care for each of the areas covered by the volume-based payments. The final element, the Health-Based Allocation Model, is a system by which the Ministry looks at the volume of services by payment group (i.e. the equivalent of diagnostic-related groups) and by age and sex, and then uses forecast age–sex rates to set service quantities for the next year. Prices are typically based on historical rates adjusted to address cost inflation.

Funding policy is set by the provincial Ministry but implemented by regional authorities known as Local Health Integration Networks (LHINs). When ICC 2.0 was initiated, Ontario had 14 regional LHINS delineated by geographical boundaries. The LHINs were responsible for payments to hospitals and other care settings, such as home care providers. ICC 2.0 took a programme that had been implemented in only one hospital and scaled it across all nine hospitals in the largest region in Ontario. Other partner agencies include the regional health authority and home care authority, a centralized home care provider, and the Ministry, as well as community health centres and the primary care physician lead.

At the time of implementation, home care in Ontario was organized and funded by one of the 14 regional Community Care Access Centres (CCACs). Each LHIN had one CCAC, and LHINs provided the CCACs with a global budget that was used exclusively to pay for home care services. CCAC staff assess patients referred for home care services, determine service levels and then create service contracts with both for-profit and non-profit independent home-care service organizations. In this context, with the goal of providing integrated care, ICC 2.0 was implemented beginning in 2015.

1.3 Level of integration

ICC 2.0 aimed to set up a seamless patient-centred care continuum, extending from the hospital to the home, for patients with COPD or CHF, thus implementing vertical integration among different levels of care. The goal was for patients to have one consistent team delivering care along an integrated care pathway. The idea was that this would result in overall improvements to patients’ experiences, as well as increase the quality of care and improve health system outcomes, such as reducing hospital readmissions. As part of the programme, a single, integrated payment is shared between the hospital and the home care provider for the specified episode of
care for patients who meet the inclusion criteria (i.e. patients with COPD or CHF who enrolled in the ICC 2.0 programme). Technically, the hospital was the fundholder and created contracts with a single home-care provider to deliver services across the entire region.

1.4 Current state of the programme

Nine hospitals participated in the IFM programme, representing all of the hospitals in the LHIN geographical region that implemented ICC 2.0, accounting for about 10% of the volume of services in all Ontario hospitals. A total of 3010 patients voluntarily participated in the programme during the evaluation period, which ran from October 2015 to March 2018, for an average of 100 enrolled per month and 1200 per year. These numbers represent 44% of all individuals with COPD or CHF treated in the participating hospitals. Approximately 50% of enrolled patients had CHF and 50% had COPD. Similar numbers of patients continued to be enrolled after March 2018, although exact numbers were unavailable (see Section 4.1).
Design of the programme
2.1 Episode of care

Hospitalization for either COPD or CHF was considered the index or triggering event for the bundled-care episode. The episode of care included the following for each participant:

- a hospital-based care coordinator and a multidisciplinary team of providers who worked with the patient to develop a comprehensive discharge plan to effectively manage their condition;
- care from a designated home care provider who worked with the team to meet the patient’s needs after discharge;
- shared electronic health information systems that facilitated communication across acute and home care services;
- telehealth care available 24 hours/day and 7 days/week;
- a single, integrated payment shared between the hospital and the home care provider for the episode of care.

2.2 Care pathways

The care pathway for both CHF and COPD involved a consistent evidence-based model for inpatient care and a three-level pathway for postacute care, with categories for low, moderate and high acuity and commensurate care. For the most part, these three levels correspond to, respectively, patients who need no personal support, once daily personal support and two or more daily personal support visits after discharge for an acute event. Within the hospital, COPD patients were also classified according to their need for ventilation. Allocation to a pathway was based on clinical judgement. Data about the proportion of patients in each pathway were collected but are not available.

2.3 A single home-care provider

A key design feature that distinguishes ICC 2.0 from usual care in Ontario is the integration of home care as part of the acute care episode and the use of a single home-care provider to deliver ICC 2.0 care for all enrolled patients. This enabled delivery of a consistent pathway of care for all participants that was provided by a small group of care coordinators and clinical staff. Under the previous model – that is, before ICC 2.0 – postacute home care services were arranged by a regional home care agency with a range
of private companies that were allocated cases based on their market-share contracts. The status quo approach does not allow for dedicated case management and the delivery of services by a team of providers that is focused on ensuring care continuity and consistency across a specific patient population, which is the model that is enabled by ICC 2.0.

### 2.4 Quality monitoring

A set of six common quality measures were selected and reported on for the IFM pilot initiative across programmes, including ICC 2.0. These measures were agreed by the members of the external evaluation team, the Ministry and the LHINs who provide funding for clinical operations. There were no specific targets other than to improve (or not worsen) compared with prior results. The agreed measures were the:

- mean index length of stay (i.e. total number of days, number of acute days);
- alternate level of care rate, also known as delayed discharge (i.e. the proportion of patients who spent any days in hospital after a physician determined that acute treatment was complete and a patient was medically ready for discharge);
- 60-day readmission rate;
- mean number of emergency department visits in the 60 days after discharge for an acute event;
- 60-day emergency department visit rate;
- 60-day mean total costs (i.e. costs included in programme monitoring that are estimated as the average costs for acute care, based on a resource intensity weight and the average case costs plus the average cost for home care).

Surveys of were also used to report on patients’ and caregivers’ experiences and outcomes.
Programme payments
Payments for the IFM are intended to cover the costs of the episode of care for COPD or CHF, beginning with acute hospital care and extending to the home-based care provided after discharge. The episode payment encompasses hospital and home-based care, including the index hospitalization (i.e. the triggering event for integrated care management) and subsequent care after the acute event for up to 60 days. IFM payments are provided to organizations and not to individuals.

It is important to note that although IFM payments are used to fund hospitals and other health care providers, such as long-term care homes, payments to physicians are not included within the funding package. In Ontario, payments to physicians are managed separately through the Ministry of Health and Long-Term Care’s Physician Services Agreement. IFM funding is used to pay for the care provided by all other acute and postacute care providers (e.g. nurses, care workers, therapists) and other health care services that are provided within hospitals as ordered by physicians (e.g. diagnostic tests, medications, and medical equipment and other supplies).

### 3.1 Calculation of payments

Funding for ICC 2.0 patients is calculated based on the projected total of all QBP payments to hospitals for CHF and COPD inpatient admissions (i.e. calculated as the number of expected cases × the QBP payment) plus the average of home care payments for 60 days of care after the acute event for each condition. QBP payments are calculated as the mean total cost per weighted case using activity-based case-costing data from a set of 13 case-costing hospitals in Ontario. For QBPs, the case-costing payments are adjusted by hospital-specific case-mix weights. The purpose of adjustment is to ensure that hospitals are compensated when they care for patients with more complex needs so they do not have an incentive to select only patients that need less care. Case-costing hospitals track individual patient costs using an activity-based costing approach, and individual case costs are tracked and reported to the Ministry. These are considered to provide the most accurate patient-specific costs. The home care budget per episode is based on the historical average cost per COPD and CHF patient in the 60 days after discharge for an acute event. Target volumes are based on historical use patterns and adjusted by the expected increase in the population prevalence of the target condition. Therefore, the source of revenue (i.e. the budget) is based on these two payments (i.e. for hospital and home care) that are calculated by the LHIN. The change is that the payment for postacute care is now sent to the hospital, rather than the regional home care agency, and used to contract with independent home-care companies for postacute services.
The total budget for the ICC 2.0 programme is based on the volume of services multiplied by the price for each participating hospital, pooled alongside the home care allocation paid by the LHIN regional fundholder. Payments for the full episode of care are then sent to the lead organization (i.e. the lead hospital). Approximately 80% of the programme’s budget is sourced from the original QBP funding for acute hospital care, with the remaining 20% drawn from the original allocation (i.e. prior to ICC 2.0) for home care services; approximately 0.4% of the ICC 2.0 programme’s budget is provided based on the estimated need for care coordination for pre-existing patients.

After the programme was implemented, the funding allocated for acute hospital care decreased to 70% (from approximately 80%), while the budget allocated to home care was increased to 25% (from approximately 20%). Substantially more funding was also allocated to care coordination, which increased to approximately 5% of the total budget (from less than 1%). While specific programme payments are not disclosed, the average provincial QBP payment for COPD was Can$ 7400 (US$ 6133) and for CHF it was Can$ 8418 (US$ 6977). These rates have not changed since 2015. Calculated from this information and the programme budgeting model, the average payment to a typical hospital would be Can$ 9250 (US$ 7667) for COPD and Can$ 10 523 (US$ 8721) for CHF.

### 3.2 Reward structure

The model does not incorporate explicit rewards for hospitals based on their performance and implementation of the programme. However, any cost savings that result from implementation by hospital partners are considered rewards, and cost savings are distributed in equal percentages among all participating organizations (i.e. acute and postacute care providers). There are no penalties for hospitals that fail to implement the programme or reach specific targets. There are maximum numbers of patients that hospitals are expected to treat, and hospitals may not be compensated for volumes that exceed these targets. In 2020, the programme disbursed accumulated savings to participating organizations.
3.3 Disincentives for performance

The episode of care for COPD or CHF begins with hospitalization and continues until 60 days after discharge. Patients who are readmitted after the 60-day period trigger a new event, resulting in a new provider payment. In addition, readmissions that occur within 60 days receive an additional payment for each admission as part of the overall hospital volume targets for COPD and CHF admissions. This could serve as a disincentive for providers to take adequate measures to prevent patients being readmitted. In addition, the ICC 2.0 budget is set for all participating hospitals as a group, so individual efficiencies (i.e. overages) achieved by one organization are shared among all participating organizations, thus decreasing the incentive for any one organization to create efficiencies and savings.
Evaluation of the programme’s impact
The goal of the initiative for the IFM was to test innovative approaches to integrated care and funding during a patient’s episode of care.

The Health System Performance Network (HSPN) was engaged to evaluate the outcomes of ICC 2.0. The HSPN was established in 2009 and receives funding from the Ontario Ministry of Health to conduct research and evaluations that support measurement of health system performance and improvement in Ontario. The results of this independent evaluation have been published on the Network’s website (7). The evaluation team incorporated a multimethods approach, conducting a difference-in-differences analysis to measure health care utilization outcomes, while also conducting monthly patient and caregiver surveys to measure satisfaction (8).

All data were analysed at the Institute for Clinical Evaluative Sciences, which is a prescribed organization in Ontario that holds all administrative records from health care encounters paid for by the public health care system. The Institute has a special designation in Ontario legislation to hold these data for the purposes of health system evaluations and planning. Analyses for these purposes do not require approval from a research ethics board because they are permitted according to Ontario’s Personal Health Information Protection Act.

Outcomes of interest included in the difference-in-differences analysis were the:

- mean index length of stay (i.e. the total number of days in hospital, acute days, days discharge was delayed);
- total number of days in hospital (i.e. index + readmission) during 60 days after discharge for an acute event;
- 60-day readmission rate and a composite outcome of readmission or death, to account for competing risks;
- 60-day visit rate to emergency departments and visits to the emergency department or death, to account for competing risks;
- 60-day mean total costs.

For the evaluation, total costs included all government-funded health care services within and outside of the bundle, to account for potential cost-shifting from care within ICC 2.0 to care delivered by other providers (e.g. physicians or long-term care services) that are not included in the payments. The total costs are all costs paid for by the Ministry for the patient within 60 days. These were calculated using algorithms created to measure total health system costs using administrative claims databases that collect data from all reported patient records (9). Costs include acute care, postacute...
rehabilitation and complex hospital care; institutional long-term care, which is based on resource-intensity weights and average costs per weighted case; as well as home care, pharmacy and physician visits, which are based on per-visit payment amounts (7).

4.1 Evaluation methods

4.1.1 Intervention cohort

ICC 2.0 began enrolling patients in October 2015. For the evaluation, patients were identified in administrative data using a special project field in the standard hospital reporting database (i.e. the Canadian Institute for Health Information’s Discharge Abstract Database).

The ICC 2.0 project team was also responsible for transferring case records quarterly for individual patients from a reporting template directly to the Institute for Clinical Evaluative Sciences, starting in fall 2016. Each reporting template had a registry of enrolments, which included each patient’s health card number and date of enrolment, as well as reports about whether key pathway elements had been utilized for the patient (e.g. respiratory therapist visit with patient, postacute home care visit).

The population for the evaluation was based on all records identified either through hospital case records in the reporting template or via hospital administrative databases.

A total of 3010 patients were identified as being enrolled in ICC 2.0 between October 2015 and March 2018 through examination of all data sources (Table 1). The total number of patients with COPD or CHF during this period was 6831, meaning that the programme had a patient participation rate of 44%. Communications with the ICC 2.0 leadership in 2023 confirmed that the proportion of patients enrolled in the programme continues to be slightly less than 50% of all CHF and COPD patients. Qualitative interviews with patients and ICC 2.0 staff and leadership highlighted that although all eligible patients (i.e. those admitted to hospital for COPD or CHF treatment) were invited to participate, most of those who declined were already receiving home care services prior to admission. These individuals tended to decline to participate because they would have had to change their home care provider (i.e. their personal support worker) to one who was included in ICC 2.0. This would break personal ties with existing providers, even though the new caregivers were trained in the ICC 2.0 care pathway.

Enrolment records for patients with an index event of total length of stay that was less than 30 days and missing any data for matching
variables (e.g. age, sex) were removed: 494 patients were removed, about 16% of enrollees. This left 2516 ICC 2.0 enrollees for matching. If a patient had multiple index records within the expected bundle period (i.e. 60 days), the later record was considered a readmission rather than a new index event.

The patients and comparators were matched using propensity scores, resulting in a strong balance between intervention and comparator patients. Standard differences and variance ratios for each variable were evaluated. All covariates included in the propensity model were balanced between groups (i.e. standard differences ≤ 0.1; variance ratio < 1.15 across 84 comparisons). This provides evidence of a lack of bias in the results comparing effectiveness. Similar to a randomized controlled trial, this balancing of the covariates also means that the evidence of the effect of ICC 2.0 for patients who were not included in the analysis is unknown.

### 4.1.2 Comparator cohorts

Three cohorts of patients admitted to hospital that met the same enrolment criteria as the ICC 2.0 enrollees were identified as comparator cohorts (Table 1). The three cohorts were:

- historical admissions to ICC 2.0 facilities from October 2011 to September 2014 (i.e. prior to ICC 2.0);

- admissions to comparator facilities (i.e. identified as peers by ICC 2.0 facilities) during the same period as ICC 2.0 (October 2015 to March 2018); and

- historical admissions to these comparator facilities.

The period from October 2014 to September 2015 was excluded because several facilities began to implement ICC 2.0 during this period, using pilot tests of programme elements with a few patients each month, which increased over time to full implementation as of October 2015.
Table 1. Intervention and comparator populations for evaluation of Integrated Comprehensive Care model 2.0, Ontario, Canada, 2019

<table>
<thead>
<tr>
<th>Patient population</th>
<th>No. of patients (October 2015–March 2018)</th>
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<tr>
<td>Total population enrolled in ICC 2.0</td>
<td>3 010</td>
</tr>
<tr>
<td>Historical within-ICC facility comparator cohort</td>
<td>3 889</td>
</tr>
<tr>
<td>Concurrent attendance at non-ICC programme facilities</td>
<td>5 099</td>
</tr>
<tr>
<td>Historical attendance at non-ICC facility comparator cohort</td>
<td>4 170</td>
</tr>
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ICC: Integrated Comprehensive Care model. 
Source: Data reproduced with permission from Walker et al. (7).

4.1.3 Difference-in-differences analysis

Patients meeting enrolment criteria were entered into a project registry or identified using hospital records, or both. Patients from comparator facilities that met the same enrolment criteria were identified.

ICC 2.0 enrolees were matched with historical patients from ICC 2.0 facilities and then with concurrent patients from comparator facilities. The concurrent comparator facility patients were then matched with historical patients from these same facilities. All index hospitalizations lasting longer than 30 days were excluded from the matching process. Individuals were matched 1:1 using the greedy/nearest neighbour algorithm with four criteria that had equal weighting on the basis of (i) the logit of their propensity score, with a caliper set at 0.2 times the standard deviation; (ii) their age in days ± 1826 (5 years); (iii) sex; and (iv) index admission or emergency department visit.

The propensity score was based on a regression of IFM enrolment on sociodemographic variables (i.e. age, income quintile, rurality index); comorbidity (Johns Hopkins’ Collapsed Aggregated Diagnosis Groups [CADGs]), with all two-way interactions between CADGs; prior emergency department visits and hospital admissions; and project-specific variables, as required. The project-specific variables included the condition COPD or CHF. The covariate balance between selected enrolees and selected comparators was assessed using standard differences, with a standard difference of < 0.10 indicating balance, and variance ratios, with values closer to 1.0 indicating balance. The $\chi^2$, one-way analysis of variance (or ANOVA) or Cochran–Armitage trend tests, as appropriate, were also used to
compare matched groups. Potential bias was assessed by comparing standard differences for the baseline covariates between enrollees selected versus not selected using the matching algorithm (i.e. comparing enrollees that were assigned a matched comparator to those for whom no match was available) (7). Baseline characteristics of the intervention and comparator populations are shown in Table 2.

### 4.2 Evaluation results

The change in patients’ outcomes after IFM implementation compared with the period prior to implementation was calculated and compared with the changes in non-IFM facilities using the difference-in-differences analysis. There was an overall matching rate of 77%, so 1946 patients were included in the analysis.

All evaluation results are displayed in Table 3. The proportion of patients with alternate level of care days, emergency department visits or readmissions or death at 60 days was significantly lower for patients from ICC 2.0 hospitals in the post-implementation period relative to the pre-implementation period.

The mean index total length of stay for ICC 2.0 hospitals was reduced by 1.3 days more than for comparators during the same period ($P < 0.0001$). ICC 2.0 enrollees also had statistically significant greater reductions in rates of readmission or death at 60 days after discharge relative to comparators, as well as reductions in rates of emergency department visits and death. For the 60-day bundle period, the total cost reduction over time was Can$ 3264 (US$ 2705) per episode greater for ICC 2.0 patients relative to non-ICC2.0 comparators.

Data about patients’ experiences were also reported, but comparative data were not available and, therefore, these data were not considered in the evaluation.
Table 2. Baseline characteristics of matched enrolees and comparators for the evaluation of the Integrated Comprehensive Care model 2.0, Ontario, Canada, 2019

<table>
<thead>
<tr>
<th>Variable</th>
<th>Patients in ICC 2.0 (n = 1946)</th>
<th>IFM and historical patients from the same facilities&lt;sup&gt;a&lt;/sup&gt;</th>
<th>IFM and concurrent patients at comparator facilities&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Concurrent and historical patients at comparator facilities&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Enrolee</td>
<td>Historical</td>
<td>Standard difference</td>
<td>Variance ratio</td>
</tr>
<tr>
<td>Age (years)</td>
<td>76.49 ± 10.44</td>
<td>76.45 ± 10.46</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Sex (% male)</td>
<td>925 (47.5)</td>
<td>925 (47.5)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Propensity</td>
<td>0.32 ± 0.64</td>
<td>0.35 ± 0.63</td>
<td>0.04</td>
<td>0.03</td>
</tr>
<tr>
<td>Rurality (% population)&lt;sup&gt;b&lt;/sup&gt;</td>
<td>4.86 ± 7.04</td>
<td>4.81 ± 7.06</td>
<td>0.01</td>
<td>0.02</td>
</tr>
<tr>
<td>CADG group (no. [%])</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CADG1 (acute minor)</td>
<td>1808 (92.9)</td>
<td>1828 (93.9)</td>
<td>0.04</td>
<td>0.05</td>
</tr>
<tr>
<td>CADG2 (acute major)</td>
<td>1813 (93.2)</td>
<td>1819 (93.5)</td>
<td>0.01</td>
<td>0.05</td>
</tr>
<tr>
<td>CADG3 (likely to recur)</td>
<td>1458 (74.9)</td>
<td>1486 (76.4)</td>
<td>0.03</td>
<td>0.02</td>
</tr>
<tr>
<td>CADG4 (asthma)</td>
<td>297 (15.3)</td>
<td>336 (17.3)</td>
<td>0.05</td>
<td>0.04</td>
</tr>
<tr>
<td>CADG5 (chronic medical unstable)</td>
<td>1862 (95.7)</td>
<td>1860 (95.6)</td>
<td>0.01</td>
<td>0.03</td>
</tr>
<tr>
<td>Variable</td>
<td>Enrolee</td>
<td>Historical</td>
<td>Standard difference</td>
<td>Variance ratio</td>
</tr>
<tr>
<td>----------</td>
<td>---------</td>
<td>------------</td>
<td>---------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>CADG6 (chronic medical stable)</td>
<td>1 734 (89.1)</td>
<td>1 741 (89.5)</td>
<td>0.01</td>
<td>0.97</td>
</tr>
<tr>
<td>CADG7 (chronic specialty stable)</td>
<td>135–139</td>
<td>145–149</td>
<td>0.02</td>
<td>1.07</td>
</tr>
<tr>
<td>CADG8 (eye/dental)</td>
<td>389 (20.0)</td>
<td>429 (22.0)</td>
<td>0.05</td>
<td>1.07</td>
</tr>
<tr>
<td>CADG9 (chronic Specialty Unstable)</td>
<td>453 (23.3%)</td>
<td>448 (23.0)</td>
<td>0.01</td>
<td>0.99</td>
</tr>
<tr>
<td>CADG10 (psychosocial)</td>
<td>895 (46.0)</td>
<td>874 (44.9)</td>
<td>0.02</td>
<td>1</td>
</tr>
<tr>
<td>CADG11 (preventive/administrative)</td>
<td>1 017 (52.3)</td>
<td>1 057 (54.3)</td>
<td>0.04</td>
<td>0.99</td>
</tr>
<tr>
<td>CADG12 (pregnancy)</td>
<td>1–5</td>
<td>1–5</td>
<td>0.04</td>
<td>2.5</td>
</tr>
<tr>
<td>Income quintile (no. [%])</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0–20</td>
<td>635 (32.6)</td>
<td>627 (32.2)</td>
<td>0.01</td>
<td>0.99</td>
</tr>
<tr>
<td>20–40</td>
<td>435 (22.4)</td>
<td>441 (22.7)</td>
<td>0.01</td>
<td>1.01</td>
</tr>
<tr>
<td>Variable</td>
<td>Enrolee</td>
<td>Historical</td>
<td>Standard difference</td>
<td>Variance ratio</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>---------</td>
<td>------------</td>
<td>---------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>40–60</td>
<td>362 (18.6)</td>
<td>354 (18.2)</td>
<td>0.01</td>
<td>0.98</td>
</tr>
<tr>
<td>60–80</td>
<td>287 (14.7)</td>
<td>281 (14.4)</td>
<td>0.01</td>
<td>0.98</td>
</tr>
<tr>
<td>80–100</td>
<td>227 (11.7)</td>
<td>243 (12.5)</td>
<td>0.03</td>
<td>1.06</td>
</tr>
</tbody>
</table>

### Medical condition (no. [%])

<table>
<thead>
<tr>
<th>Medical condition</th>
<th>Enrolee</th>
<th>Historical</th>
<th>Standard difference</th>
<th>Variance ratio</th>
<th>Enrolee</th>
<th>Concurrent</th>
<th>Standard difference</th>
<th>Variance ratio</th>
<th>Concurrent</th>
<th>Historical</th>
<th>Standard difference</th>
<th>Variance ratio</th>
<th>Concurrent</th>
<th>Historical</th>
<th>Standard difference</th>
<th>Variance ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>COPD</td>
<td>977 (50.2)</td>
<td>978 (50.3)</td>
<td>0</td>
<td>1</td>
<td>977 (50.2)</td>
<td>987 (50.7)</td>
<td>0.01</td>
<td>0.01</td>
<td>987 (50.7)</td>
<td>1016 (52.2)</td>
<td>0.03</td>
<td>0.03</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHF</td>
<td>969 (49.8)</td>
<td>968 (49.7)</td>
<td>0</td>
<td>1</td>
<td>969 (49.8)</td>
<td>959 (49.3)</td>
<td>0.01</td>
<td>0.01</td>
<td>959 (49.3)</td>
<td>930 (47.8)</td>
<td>0.03</td>
<td>0.03</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of hospital admissions in 1 year prior</td>
<td>1.10 ± 1.55</td>
<td>1.12 ± 1.44</td>
<td>0.01</td>
<td>1.17</td>
<td>1.10 ± 1.55</td>
<td>1.19 ± 1.52</td>
<td>0.06</td>
<td>0.06</td>
<td>1.19 ± 1.52</td>
<td>1.20 ± 1.55</td>
<td>0.01</td>
<td>0.01</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of emergency department visits in prior 1 year</td>
<td>2.37 ± 2.85</td>
<td>2.39 ± 2.85</td>
<td>0</td>
<td>1</td>
<td>2.37 ± 2.85</td>
<td>2.55 ± 2.69</td>
<td>0.06</td>
<td>0.06</td>
<td>2.55 ± 2.69</td>
<td>2.55 ± 2.75</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CADG: Collapsed Aggregated Diagnosis Groups; CHF: congestive heart failure; COPD: chronic obstructive pulmonary disease; ICC: Integrated Comprehensive Care; IFM: integrated funding model.

*a* Values are mean number ± standard deviation or mean number (%) unless otherwise indicated.

*b* Data on rurality derived from Rurality Index of Ontario (10).

*c* Values are a range: the exact number has been supressed to ensure anonymity.

Source: Data reproduced with permission from Walker et al. (7).
Table 3. Difference-In-differences outcome model estimates for evaluation of the Integrated Comprehensive Care model 2.0, Ontario, Canada, 2019

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Sample size</th>
<th>Group</th>
<th>Pre-implementation</th>
<th>Post-implementation</th>
<th>Relative difference (post-implementation/pre-implementation)</th>
<th>Absolute difference (post-implementation – pre-implementation)</th>
<th>P value</th>
<th>Difference in differences (relative)</th>
<th>Difference in difference (absolute)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean index visit total length of stay (days)</td>
<td>1,946</td>
<td>IFM</td>
<td>8.41</td>
<td>6.27</td>
<td>0.75</td>
<td>−2.14</td>
<td>&lt;.0001</td>
<td>0.83</td>
<td>−1.32</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Non-IFM</td>
<td>8.02</td>
<td>7.19</td>
<td>0.9</td>
<td>−0.82</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Relative difference (post-implementation/pre-implementation)</td>
<td>Absolute difference (post-implementation – pre-implementation)</td>
<td>P value</td>
<td>Difference in differences (relative)</td>
<td>Difference in difference (absolute)</td>
<td>P value</td>
</tr>
<tr>
<td>Index rate for alternate level of care</td>
<td>1,946</td>
<td>IFM</td>
<td>0.12</td>
<td>0.01</td>
<td>0.11</td>
<td>−0.1</td>
<td>&lt;.0001</td>
<td>0.77</td>
<td>−0.1</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Non-IFM</td>
<td>0.06</td>
<td>0.06</td>
<td>0.97</td>
<td>0</td>
<td>0.83</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60-day rate of readmission or death</td>
<td>1,946</td>
<td>IFM</td>
<td>0.39</td>
<td>0.28</td>
<td>0.73</td>
<td>−0.11</td>
<td>&lt;.0001</td>
<td>0.74</td>
<td>−0.1</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Non-IFM</td>
<td>0.37</td>
<td>0.37</td>
<td>0.99</td>
<td>0</td>
<td>0.79</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60-day rate of emergency department visit or death</td>
<td>1,946</td>
<td>IFM</td>
<td>0.48</td>
<td>0.40</td>
<td>0.82</td>
<td>−0.09</td>
<td>&lt;.0001</td>
<td>0.84</td>
<td>−0.08</td>
<td>0.0006</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Non-IFM</td>
<td>0.50</td>
<td>0.49</td>
<td>0.98</td>
<td>−0.01</td>
<td>0.54</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60-day mean total no. days in hospital</td>
<td>1,378</td>
<td>IFM</td>
<td>11.82</td>
<td>8.48</td>
<td>0.72</td>
<td>−3.34</td>
<td>&lt;.0001</td>
<td>0.82</td>
<td>−1.83</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Non-IFM</td>
<td>11.60</td>
<td>10.09</td>
<td>0.87</td>
<td>−1.51</td>
<td>&lt;.0001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60-day mean total cost</td>
<td>1,123</td>
<td>IFM</td>
<td>Can$ 20,745</td>
<td>Can$ 14,882</td>
<td>0.72</td>
<td>−Can$ 5,863</td>
<td>&lt;.0001</td>
<td>0.82</td>
<td>−Can$ 3,264</td>
<td>0.0003</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Non-IFM</td>
<td>Can$ 20,231</td>
<td>Can$ 17,632</td>
<td>0.87</td>
<td>−Can$ 2,599</td>
<td>0.0004</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(US$ 17,194)</td>
<td>(US$ 12,334)</td>
<td></td>
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<td></td>
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<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>(US$ 14,613)</td>
<td>(US$ 14,613)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

IFM: integrated funding model.

* Pre-implementation refers to the period from October 2012 to September 2014.  " Post-implementation refers to the period from October 2015 to March 2018.

Source: Data reproduced with permission from Walker et al. (7).
4.3 Limitations of the analyses

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 information about patients’ experiences. Although we did not include programme administration funding of approximately Can$ 150 000 (US$ 124 324) per year per programme, the overall cost savings are substantially larger. Costs captured here are only those for health care services paid by the Ministry of Health and Long-Term Care. There may be other unmeasured social costs. Earlier discharge from an acute hospital stay may have additional costs for patients and their caregivers. The caregivers may have experienced an increased burden in caring for patients who were discharged earlier from hospital and spend more days at home while they need care.

The data for this study are largely based on administrative data that lack clinical detail regarding the severity of disease across population groups. Because all eligible individuals were not enrolled in the programme, differences in clinical severity between the intervention and comparator populations that may have affected costs cannot be ruled out.

The analyses are also limited. While we examined the total cost of all care for each patient, actual cost savings may not have been achieved in aggregate at the level of the health care budget. 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 from 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 their care is paid for using volume-based payments (e.g. many surgical patients), while care for others (e.g. patients with gastrointestinal bleeding) is paid for through population-based global budgets at the hospital level. Assessing the budget impact of the ICC 2.0 programme at the hospital or payer level was beyond the scope of the present analyses.
Facilitating and challenging factors for providing integrated care
As part of the evaluation process for ICC 2.0, interviews were carried out with six individuals from different organizations and at different levels of management. These interviews aimed to explore the implementation challenges that providers faced and what measures were taken to overcome them. Interviewees included leaders of hospitals and home care organizations, financial and clinical administrators, as well as clinicians. Elements from these interviews that are pertinent to the replication and scale up of the programme are extracted in the following sections (11).

5.1 Facilitators of implementation and integration

Programme integration was achieved by building on existing cultures and structures. This was done on multiple levels, from using already-shared information systems to building upon established cultures of collaboration and engagement. This means there were established cultures within each participating organization that focused on engaging with other providers to help solve system-wide problems. Integration was also actively generated by fostering new mechanisms that worked within the parameters of the ICC initiative, such as setting up new partnerships between organizations and among teams from acute care and community-based home care settings that were based on trust, ensuring that a thoughtful model was developed that was committed to engaging clinicians and sharing information about care practices in each care setting.

5.1.1 The single home-care provider advantage

Essential to implementing ICC 2.0 were the integration of home care with acute care during a single episode and within a care pathway, the sharing of information across health care providers about a patient’s condition and their disease-management activities, and the use of a single home-care provider to provide ICC 2.0 care for all enrolled patients. The use of a single agency for home care enabled the delivery of a consistent standard of care by a small group of care coordinators and clinical staff for all participants. This also enabled the use of a single 24 hour/day 7 day/week telehealth number for all patients. To achieve this, ICC 2.0 applied for community service status, allowing it to bypass the usual care approach of contracting with a regional home care agency to assess patients and deliver services from multiple registered providers. It allowed ICC 2.0 to contract directly with home care service organizations. This decision was welcomed by programme leadership despite the initial bureaucratic work it required.
5.1.2 Structuring programmes

ICC 2.0 faced the effects of discrepancies in structure and practice across partner organizations, with 15 partners and the programme being implemented at the regional level. ICC 2.0 ran into challenges in coordinating care across partners of different sizes and with different resources that were located in different areas, as described by one hospital manager,

[We] have an ambulatory [respiratory] clinic. So if I have an issue with a patient in the community, I have access to a team with expertise in managing COPD at my fingertips. Whereas not every site is going to have that . . . So, for example, if I need to bring a patient into clinic, typically they live within a very short distance of the hospital. . . . But if we go out now to [a rural area], well, (a) they don’t have a clinic and (b) their patients may be living an hour, 45 minutes from a physician [in a place] where they don’t have buses or taxis readily available . . . So there are going to be different challenges as we spread this model across the region.

However, local-level clinical engagement across the multiple partner organizations helped ICC 2.0 negotiate issues of scale. Trying to ensure accessibility across a region of several hundred kilometres from a single location would have led to vast inequities in access.

5.1.3 Leveraging existing partnerships

Pre-existing, deep connections between organizational partners facilitated implementation of the ICC programme by building on relationships, resources and support structures that had been in place prior to ICC 2.0.

An understanding that all partners would be actively involved and would need to have respectful and amicable relationships were both mentioned as facilitating factors. ICC 2.0 had well-established relationships among its partners, including with its active regional health authority. This relationship proved very helpful in establishing the regional programme, as noted by an LHIN representative,

[There has been] a memo of understanding between all nine hospital corporations . . . probably since 2007 or 2008. And so their way of working together is well established. They do things . . . like we have one lab for all of our hospitals. One lab—think about that . . . All of our accounts payable is done centrally . . . . Because that has been in place and because the hospitals have worked together, they came together relatively easily. They know each other really well. They meet together monthly . . . It’s kind of been the culture [that they] work pretty well together.
5.1.4 Building trust

In the opinion of one stakeholder, the IFM was “not a little tiny change. This is fundamentally changing everything”. The model changed health system funding as well as care provision. In addition, it impacted team and organizational identities. Participants felt that this systemic change required a concurrent culture change and the need to develop common practices across different aspects of the health system.

Many hospital clinicians needed to overcome preconceptions of the community outside the hospital as a “black hole” into which patients disappear without suitable follow up. On the opposite side of the spectrum, community partners needed to overcome suspicions that the hospital wanted only to dump patients on them and that the model would prove beneficial only to the hospitals and not to those who provided home-based care. Among the hospitals, there was a new realization of the risks that home care providers take in entering peoples’ homes, which were sometimes not clean and were sometimes in areas of high crime, as mentioned by a hospital leader,

The hospital people’s overall message to the community, paternalistically, was we look after really sick, really complicated people, and we do it with very high technology. And you people are lovely and nice and sweet, but you couldn’t possibly do what we do. And the community-based people said, ‘You guys in hospitals are a comedy of errors. You have all of these resources, all of this infrastructure, much of which you only use a few hours a day and not on weekends or after hours’. [After a long process-mapping exercise from different perspectives]...There was a big eye-opener for many of us who said, ‘You do that in homes? Like you go out into places like that? You go into unsafe places at all hours of the day and night?’

Over time, having come to know and trust the community-care partners, physicians began discharging patients home sooner and feeling more comfortable doing so. Trust-building, in addition to facilitating interprofessional working relationships, allowed organizations to be secure in the knowledge of the transparency of their partners’ work. These interprofessional working relationships were enabled by direct contact and communication between providers. Transparency was enabled by sharing specifics about care processes and who should perform which tasks.
5.1.5 Developing thoughtful models

Developing clinical pathways and a funding model was a complicated exercise requiring attention to different perspectives across professions and sectors as ICC 2.0 was being set up. Clinicians also provided input regarding logistics, for example, one home care provider said, “Well, you know, this visit doesn’t need to be in person. We can do it by phone first.” A hospital provider commented,

The original iteration had involved stakeholders across the acute care–community spectrum working to eliminate redundant steps in the care process, represented by Post-it notes that wound around a large room.

Building a thoughtful shared strategy for risk mitigation also brought a sense of security and stability to the partners. In order to talk through the various scenarios involved in the integrated funding, participants would closet themselves in an LHIN conference room, according to a senior administrator, who commented,

We said, ‘Okay, what if volume is up 10%? The referral rate is exactly the same but just the volume is up….’ ‘What would it have meant for the hospitals, what would it have meant for the CCAC, what do we want to do? What do we do if the volume is the same… [and] everybody is on target with referrals but two of the hospitals are referring at a much higher rate than previously?… And then what if the volume is low?

Model development was challenged by a whole host of issues, including the complexity of patients’ clinical and social care, financial prognostication based on proxy calculations and unreliable costing information. In addition, it was also affected by differences in organizations’ costing platforms, the lack of a single electronic medical record system across providers, and even differences in the way partner organizations classified the same patient.

5.1.6 Engaging clinician champions

Clinicians were successfully engaged because they were included in developing the model. This ensured that their concerns were addressed and trust was fostered, and also that clinicians were formally involved in preparing the engagement strategy. As a result, clinician champions, primarily from the hospital setting, developed strategies for informing others about ICC 2.0. Some also helped negotiate challenges, such as engaging family physicians.

ICC 2.0 had a primary care physician as a lead champion, as well as specialist physician COPD and CHF leads. These clinical leads met with locally appointed hospital leads and prepared a plan to present IFM to their teams. Letters were drafted and sent to primary care
physicians informing them about the programme. After patients were discharged, the leads followed up with a survey to verify that physicians were aware of the programme. They also made sure to directly tackle the topic of billing, as one physician commented, “[Leadership] learned now that the first thing you have to talk about is how you bill for it. So you talk about how you bill for it first, and then they’ll listen. It’s true.

For specialists providing hospital care, participation in the ICC 2.0 required a willingness to practice differently and to provide care for a patient as a member of a team rather than as a solo professional. While these changes were welcomed by some, others remained cautious, finding it difficult to change their modes of practice. For some, this stemmed from a fear that the programme would strip them of their decision-making autonomy and affect their billing.

5.1.7 Sharing information

Sharing information across the hospital and home care teams proved challenging, although it was also integral for enabling integrated systems. A strong information technology infrastructure had to be set up before patient recruitment could begin. In the next step, patient data had to flow smoothly as patients transferred from hospital care to community care. Data also needed to be collected regularly and shared across the partner organizations, as well as with regional authorities, the Ministry and the evaluators.

Providers worried about possible service duplication, given that there was not a common information technology platform, as well as discrepancies in discharge processes. Further complicating these issues was the fact that, as one interviewee put it, “Each hospital has a little bit of a different take on the privacy regulations”, an issue that affected the sharing of data among partners. However, when the information technology system was put in place, it not only facilitated seamless patient transitions but also allowed trust-building between providers in the hospital and those in the community. Information about patients could be shared through videoconferencing or via the Ontario Telemedicine Network. This Network, for example, enables a home-care physiotherapist to send to a picture of a patient’s wound to a care coordinator or physician, allowing for rapid feedback and changes in medication, if needed.
5.2 Challenges and mitigation

Information about challenges in implementing the programme have been published previously and highlights are provided here (12).

5.2.1 Conflicting programmes

Since patient enrolment lagged behind expectations, efforts to increase enrolment posed a formidable challenge. ICC 2.0 contracted directly with home care organizations. This meant that patients who enrolled would need to give up the personal support workers they had been working with previously through the CCAC. Since patients had already established rapport with these workers, and were uncertain about being reallocated to a new support worker, they were often reluctant to enrol in ICC 2.0. However, the integrated care coordinators served a key role in persuading patients. This was done though being flexible and identifying patients’ needs and how they could be met by ICC 2.0, according to a home care leader, who commented,

I think what we found really important was that [the] ICC coordinators are really key to being able to get people to buy into the model. They stretch it a little bit....[They] figured out a way to get people into the programme and what would benefit them. And [they figured] that [patients] didn’t need all the bundled services. Maybe they only needed a piece of the ICC bundle. And so we were able to do that. Because initially [how] we set it up, you’d get a [personal support worker], you’d get all these things. Well, some people don’t need everything. So let’s use our resources wisely....[The ICC coordinators] did it on the ground. And they started making some, I’m going to say, workarounds sometimes. And I should say as well, it’s about how they presented the bundle too. Because they were sort of like salespeople.

The 60-day bundle length was also a key factor in low enrolment. It became clear in the second year of ICC 2.0 that many patients were return patients, emphasizing that a longer programme could prove more valuable. A hybrid model was also under consideration in which the ICC 2.0 team would work with patients’ existing personal support workers to assuage patients’ worries and increase enrolment.

5.2.2 Engaging physicians

Building the confidence of clinicians in ICC 2.0 was key. This confidence was challenged early during the roll out when community partners were unable to always provide the services needed due to staffing deficits. This caused concerns about a loss of trust in the system.
Clinicians and coordinators were engaged by educating them about ICC 2.0, sharing early data that showed their work was making a difference and by actively seeking them out and requesting their input about how to address challenges, such as low enrolment.

Some clinicians reached in this way subsequently became ICC 2.0’s most stalwart champions. They situated themselves at the heart of it, securing both physician engagement and patient consent for enrolment.

The assurance of sustainability was a helpful prerequisite for engaging physicians. This engagement in turn fostered sustainability by providing evidence of the programme’s effectiveness.

5.2.3 Negotiating differences

ICC 2.0 worked with 15 partner organizations, which amplified differences. One stakeholder mentioned that, “Each hospital has a distinct personality” and some hospitals got along better with each other, while others “[had] to be pushed a bit more” due to their organizational structure and perceptions about the commitment of their leadership. Small hospitals in close-knit communities and their urban counterparts, which abound with specialist clinics, often felt like “two different worlds”, according to one hospital administrator. These differences in size and resources led to one small hospital deciding to opt out of ICC 2.0. Human resources also played a role, as different perspectives on union regulations came into play, resulting in different opinions about who could occupy which roles. Positions for hospital-based integrated care coordinators, for instance, were disputed by pre-existing home care coordinators over concerns that the new positions were taking work away from them. As one senior administrator commented,

Every single hospital site has a different set of rules and a different [set of forms]. [So you have to teach the coordinators] how to interpret different discharge summaries and different medication reconciliations, and why does one hospital not even provide one, and why can’t they get one.... There’s a lot of politics when you involve various different hospitals, and you’re providing a programme [ICC 2.0] to them that they didn’t develop. It’s not necessarily well received. So [there were] a lot of challenges and roadblocks working with multiple hospital sites....Every hospital has a different set of rules, a different set of union rules, a different set of ideas about how they could function.[...There’s a lot of opinion in everything you do, and every decision you make now needs to go through nine hospitals. If you want to change a weekend rotation for the coordinators, you have to have nine hospitals agree. And guess what? They don’t.
Complexities related to the scale and scope of ICC 2.0 were particularly felt at the coordinator level, with 15 coordinators spread across nine hospitals, some being the only one at their sites, which raised concerns about practice standardization. This was further compounded by the lack of formal orientation for and oversight of coordinators.

There were also challenges in sharing information across multiple hospitals, with stakeholders having to navigate different privacy regulations regarding data sharing. Communication across providers also needed to be done “without bombarding everybody with emails or communication they don’t need to know about”, as one interviewee said.

### 5.2.4 Patient complexity

Overall, while the IFM was considered a step in the right direction because it focused on holistic patient care and distanced itself from transactional treatment-based care, stakeholders believed that more was required for the model to reimagine health care delivery and to account for comorbidities and social complexity in a meaningful way. Stakeholders also tended to bemoan the clinical and financial complexity involved with providing bundled care for patients with COPD or CHF, while simultaneously applauding the decision to tackle these conditions because of their well-established evidence-based care standards and the greater need for process efficiencies that could lead to a greater scope for positive outcomes for patients and the health system. However, the clinical and social complexity associated with patients with chronic diseases challenged ICC 2.0’s ability to project costs for a typical patient. This meant that often funds that were anticipated to correlate with the services used could be allocated only tentatively because the models were still being developed, and the exact numbers of patients and the services required were unknown. One senior administrator commented,

> There’s no real focus on the determinants [of health]. And so people come back to hospital because they weren’t able to follow up on appointments because maybe they’re not health literate or they may not have food, and maybe they don’t have transportation. And that’s not being met with the current model….So the Ministry, the LHIN, we need to tie these things together and not be doing them separately.

A majority of interviewees also considered that increasing the length of time associated with the bundle of care (i.e. to more than 60 days after discharge) would be a way of better wrapping care around the patient, believing that this would lead to better long-term patient outcomes, and this has implications for systemic sustainability. Stakeholders also mentioned the idea of embedding
the model further upstream in the health care system – that is, prior to hospitalization – so that primary care would become a point of education, intake and prevention.

### 5.2.5 Ownership challenges

The lead organization and originator of the ICC programme functioned as the sole holder of the bundled payments during the implementation of ICC 2.0. This proved useful in the bundle-utilization analysis, in evaluation and in reporting back to evaluators across the nine participating hospitals.

However, over time, some stakeholders at individual hospitals expressed a desire to have ownership of their own bundles. This resulted from the fact that bundle cost savings were averaged across the programme, leading to diluted rewards and stymied innovation. As an administrator from one hospital commented,

> If [the lead organization] was not performing as well in terms of the length of stay or if our coordinators were putting in substantially more home care resources... if our cost per patient was much higher and we weren’t performing as well as [a partner], the challenge with the way the bundle is structured now is that it averages out across everyone. So there’s, in theory, a little less incentive for [the lead organization] in that scenario or [for the partner] even to be really pushing the envelope and to be innovating because they don’t get as direct an impact from that.... My strong bias is that it should be [that] each hospital is a bundle holder, or whichever group we define. But those that are influencing their own care pathways [should] actually have ownership of the bundle because then they can benefit from the changes that they’re making and not have them be a bit diluted across the system.

The fact that ICC 2.0 was originally developed in one site and spread to all hospitals across the region meant that the pathway was perceived as being “given to each hospital site” as opposed to being developed by them. This, and the fact that funding was averaged across all participating sites, are two factors influencing the desire for autonomy by hospitals.

However, while autonomous bundle ownership may boost accountability at the organizational level, it also has potentially negative implications for the small organizations that are supported by their larger counterparts within a bundle. This happened in a small community hospital with low volumes and an ICC 2.0 coordinator role that required buttressing by a larger partner hospital that provided additional support, and in some cases a single individual had multiple roles.
Lessons for other settings
6.1 Programme-enabling factors

Overall, ICC 2.0 was created and has been sustained for more than a decade, and has grown from one organization to nine hospitals and a total of 15 health care partners, covering a region of more than 1.4 million residents. The programme has resulted in total savings to the health care system of more than 15% for the enrolled population. The key enabling and sustaining elements are worth considering before implementing this form of bundled payment in other jurisdictions. Essential enabling factors include the sharing of information across health care providers and use of a single provider to deliver home care services for all enrolled patients. Additional key enabling factors include ensuring the engagement of clinicians by addressing their concerns to build trust and also setting up a strong infrastructure for information technology. These factors enabled hospitals to discharge patients earlier with greater confidence that the hospital could support home care providers in the community, thereby shortening the length of stay in hospital and reducing readmissions, thus reducing the total number of days of acute care and creating cost savings. Additional implementation features were also essential.

6.2 Programme implementation: flexibility, engagement and transparency

Stakeholders appreciated that the environment fostered by the Ministry allowed them to develop a programme that was sensitive to their local context, for example by allowing for direct partnership between ICC 2.0 and home care providers, and provided an opportunity for them to decide collaboratively which measures were important to evaluate rather than have the model and measures imposed. Clinician champions were created by ensuring clinicians were involved in designing the model. This local engagement supported buy-in and sustained engagement. The local implementation also provided complete transparency about funding flows and revenues and disbursements among the partners. Mitigation of risks and contingencies were also shared among all partners, thus further enabling trust through transparency.

6.3 Financial stability

The financial stability and sustainability of the model were essential. In implementing ICC 2.0, the Ministry provided assurances that total organizational budgets would not be adversely affected (e.g. if total hospital volumes were reduced, organizations were assured a base
Lessons for other settings

This enabled savings to be generated and shared among participating organizations. Shared savings were effectively additional revenue for participating organizations. At the same time, local providers were motivated more by an opportunity to improve patient outcomes than by financial considerations, which were of more concern to high-level administrators. Stable funding also ensured local support for efforts to reclaim the model from a perceived overemphasis on financial concerns, thus providing greater intrinsic motivation for clinicians.

6.4 Spread, scale and sustainability

The opportunities to spread and scale up ICC 2.0 geographically and to replicate it to address other health conditions exist, but such efforts must consider local contextual policy, and provider and payment environments, as well as the health conditions that would be addressed. Such considerations are necessary even when expanding the programme to other clinical conditions within the same participating sites. Participants also suggested that the IFM would be sustainable in the long term only if it were supported by policy-level systemic changes, such as a long-term commitment to the model as the provincial standard and integration with other ongoing care services.

ICC 2.0 is still funded separately by the province and, therefore, the funding seems at higher risk than that received from other sources. Only patients with CHF or COPD are covered by the model, while other patients admitted to the same hospital units and cared for at home after hospital discharge are not covered, thus hospital and home care staff need to constantly adjust their discharge planning models based on their patient’s illness. This is more challenging than having a common approach for all individuals.

6.5 Consideration of nonmedical determinants

Nonmedical determinants of health and outcomes must also be considered. These may include transportation, food security and even housing. Providers are often reluctant to assess these determinants if there are not linked programmes that will support individuals irrespective of their socioeconomic and demographic attributes. Participants across the board felt strongly that ICC 2.0 was worth doing, albeit perhaps with more of a view towards holistic care and systemwide sustainability.
References


