Evaluation of the Institute for Safe Medication Practices Canada (ISMP Canada) activities for the Ontario Medication Safety Support Service (MSSS)

Final Report
EXECUTIVE SUMMARY

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Prepared for:

Institute for Safe Medication Practices (ISMP) Canada

WINNIPEG | OTTAWA | EDMONTON | REGINA
admin@pra.ca www.pra.ca

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Introduction

The Institute for Safe Medication Practices (ISMP) Canada is an independent, national not-for-profit organization committed to the advancement of medication safety in all health care settings. Its mandate includes analyzing medication incidents, generating evidence-based recommendations for preventing harmful incidents, and facilitating quality improvement initiatives. ISMP Canada is presently evaluating activities undertaken as part of the Ontario Medication Safety Support Service (MSSS), a key program in which it engages to promote medication safety in the Province of Ontario. The Ontario MSSS is a joint venture with the province's Ministry of Health and Long-Term Care (MOHLTC) aimed at "[assisting] Ontario hospitals, long term care facilities and community pharmacies to implement strategies and safeguards for the prevention of patient injury from medication use."

Program description

Ontario MSSS activities that are covered in the evaluation are described in the table below, which also indicates when these activities were planned to be carried out.

ISMP Canada's Ontario MSSS activities, FY 2010–11 and 2011–12		
Activities (with brief description)	**Fiscal year**	
	2010–11	**2011–12**
Goal 1: Improve medication information transfer at transitions of care across the continuum		
Provide Best Possible Medication History (BPMH) training and update the program. BPMH training sessions help practitioners implement medication reconciliation in health care settings.	√	√
Develop, evaluate, and update tools for discharge medication reconciliation. This involves developing five medication reconciliation tools that organizations and practitioners can adapt to serve their own needs.	√	√
Create change packages for medication reconciliation and "med rec plus" in long-term care homes. These change packages were to consider: the evidence for medication reconciliation; the need for and use of a systemic process; how to ensure widespread implementation of the new approach; and how to support current and future indicator reporting. It should be noted that "med rec plus," which refers to medication management activities beyond reconciliation, has been subsumed by the concept of "medication management."	√	
Link medication reconciliation programs across the continuum of care. This involves linking the community-based *MedsCheck* program with medication reconciliation programs in hospital and long-term care settings, and with medication review programs in home care.	√	
Implement medication reconciliation at all interfaces of care (pilot project). ISMP Canada collaborated with William Osler Health Centre to help the latter improve its medication reconciliation practices, while also testing new medication reconciliation tools.	√	√
Implement discharge medication reconciliation (pilot project). Collaborating with University Health Network (UHN) researchers, ISMP Canada sought to explore the effectiveness of a pharmacist–physician collaborative model in improving medication reconciliation at discharge from general internal medicine.		√
Report on knowledge dissemination/transfer results. This relates to sharing information about the results of ISMP Canada's work in this area with the Ministry, as well as other health care system stakeholders.		√
Identify measures and data management requirements for improvement initiative. To facilitate the assessment of its medication reconciliation activities, ISMP Canada engaged an evaluation firm to develop a logic model and performance measurement framework for its Ontario MSSS activities.		√
Include provider education on narcotics (and other high-alert drugs) in training programs and change packages. To supplement its other medication safety activities related to narcotics and other high-alert drugs, ISMP Canada planned to include information about these products in its training programs, changes packages, and other knowledge products.		√
Goal 2: Improve the use of medication incident report information		

ISMP Canada's Ontario MSSS activities, FY 2010–11 and 2011–12		
Activities (with brief description)	**Fiscal year**	
	2010–11	**2011–12**
Analyze and report on medication incidents. This involves preparing analytical reports for the Ministry based on data submitted by health care practitioners to the Ontario Medication Incident Database (OMID).	√	√
Aggregate analyses of incident reports. Cluster analyses of aggregate incident data can provide insight into systems failures and facilitate development of recommendations for safe practices in particular areas (e.g., types of medications).	√	√
Disseminate findings and current issues related to medication safety, and provide key learning opportunities to avoid harm from medication incidents. ISMP Canada disseminates information about and lessons learned from medication incidents through numerous channels, including webinars, newsletters, bulletins, and alerts. The reach of its publications is significantly increased through fan-out arrangements.	√	√
Ensure security and integrity of medication incident information. Ontario reports are maintained in a secure, encrypted, and privacy-compliant information technology infrastructure.	√	√
Plan and facilitate transition to mandatory critical incident reporting. ISMP Canada is supporting an MOHLTC directive requiring hospitals to report critical incidents related to medication/IV fluids to the Canadian Institute for Health Information's (CIHI) National System for Incident Reporting (NSIR).		√
Goal 3: Support the identification, implementation, and monitoring of selected medication safety indicators		
Support data collection for and management of a medication safety indicator. This activity is intended to support development of a framework for sustaining medication safety indicators in Ontario.	√	
Facilitate identification of potential indicators for future public reporting. ISMP Canada aimed to achieve this objective by developing and then narrowing down a list of potential indicators with the assistance of a focus group consisting of health care stakeholders.	√	
Report on consensus forum pertaining to the development of provincial medication reconciliation indicators. Building on work already undertaken in this area, ISMP Canada convened a second consensus forum to select a medication safety indicator, with a focus on medication reconciliation.		√
Goal 4: Provide subject matter expertise and support for specific medication safety interventions in two selected areas		
Test and evaluate change package to prevent epinephrine-related medication incidents. This involves working collaboratively with the Ontario Hospital Association (OHA) and other organizations to understand health care practitioners' needs in preventing future epinephrine-related medication incidents, and to develop and disseminate tools and educational resources to address these needs.	√	
Beers Awareness Campaign. This project aims to generate awareness of medication safety in the elderly through a variety of mechanisms, including the provision of online content; the delivery of workshops, presentations, and webinars; collaboration with educational institutions; and integration into technology used by health care providers (e.g., patient order sets).	√	√
Narcotics Education Strategy. This was designed to support the MOHLTC's efforts to raise awareness about medication safety issues related to narcotics among health care practitioners and the public. Due to realignment of priorities, resources for this project were reallocated to other Ontario MSSS activities.		√
Knowledge Translation of Insulin Use Interventions/Safeguards. This project involves identifying and pursuing opportunities to reduce medication incidents associated with insulin use. Only the first phase of this project was planned for the evaluation period.		√
Goal 5: Medication Safety Self-Assessment (MSSA) for health care settings across the province		
Support ongoing use of MSSA programs in long-term care, acute care, community/ambulatory pharmacy, and complex continuing care/rehabilitation facilities. The MSSA program is designed to assist health care organizations in evaluating the safety of their medication systems by identifying areas requiring improvement, and developing strategies for systems enhancement.	√	√
Assess provincial MSSA results across the health care continuum, including comparison to previous results. While originally intended to assess provincial MSSA results across a range of health care settings, due to significant growth in program uptake in the long-term care sector, ISMP chose to focus on the latter.	√	
Update two MSSA programs. This involves revising the MSSA programs for long-term care (MSSA-LTC) and community/ambulatory pharmacy (MSSA-CAP) to include new evidence for medication system safety improvements, as well as suggestions for updates forwarded by program users.		√

Methodology

KEY POINTS

- This evaluation assesses the relevance, implementation, effectiveness, and performance of Ontario MSSS activities carried out by ISMP Canada between FY 2010–11 and 2011–12, inclusive, highlighting program achievements and identifying challenges and lessons learned.
- The evaluation drew on several lines of evidence, including document, literature, and administrative data reviews; case studies; key informant interviews; and stakeholder surveys.
- The response to the stakeholder survey was particularly strong, with 459 respondents, including 42 hospital administrators—nearly 10% of the sample.

This evaluation drew on several lines of evidence, including:

- A review of pertinent documents and administrative data provided by ISMP Canada, as well as pertinent literature.
- Case studies of three activity areas in which ISMP Canada is involved, each of which included interviews with two individuals familiar with ISMP Canada's work in those areas, as well as a review of relevant documents and literature.
- Key informant interviews with a total of 17 individuals, consisting primarily of external stakeholders, and including representatives of national and provincial patient safety organizations (including those with which ISMP Canada has memoranda of understanding), individual health care facilities, the pharmaceutical industry, and Canadian and international subject matter experts.
- Two surveys carried out from July 25 to August 17, 2012, inclusive (n = 338) and from October 1 to October 19, 2012, inclusive (n = 121), generating a combined sample of 459 respondents. As shown below, a wide range of health care professionals and practice settings were represented among the respondents:

Please indicate which of the following best describes your current position (n=459).		
	Number of respondents	**% of total**
Nurse/nurse practitioner	150	33%
Pharmacist	111	24%
Hospital executive/administrator	42	9%
Director/administrator of resident/long-term care	21	5%
Risk manager	17	4%
Pharmacy technician	16	3%
Patient safety—coordinator/manager/specialist	14	3%
University/college faculty	13	3%
Administration/senior manager/executive	12	3%
Physician	12	3%
Consultant/analyst/specialist	11	2%
Representative of pharmaceutical industry	9	2%
Senior government official	8	2%
Consumer	6	1%
Student	4	1%
Representative of professional association	3	1%
Coroner	2	<1%
Anaesthesiologist	1	<1%
Other	7	2%
Source: Survey of stakeholders. **Note:** Percentages may not sum to 100% due to rounding.		

Some elements of the present evaluation (most notably the value for money calculation and the stakeholder survey) build on a previous evaluation conducted by PRA on behalf of ISMP Canada in 2010, although the earlier work focused primarily on ISMP Canada's national activities, whereas this evaluation is concerned specifically with Ontario MSSS activities carried out in FY 2010–11 and 2011–12. Where applicable, however, the present work draws on the results of the earlier evaluation to examine trends of interest. Additionally, the current evaluation benefited from simultaneous data collection activities undertaken as part of a concurrent evaluation of ISMP Canada's CMIRPS activities for Health Canada; aside from reducing the overall cost of the evaluation, this arrangement provided a unique opportunity to assess leveraging across the two funding sources.

The primary challenge encountered while carrying out the evaluation related to measuring ISMP Canada's impact on its long-term and ultimate outcomes (i.e., reduction in and prevention of harmful medication incidents in Ontario, improved quality of care and patient outcomes, and reduced costs associated with harmful medication incidents and increased sustainability of the health care system). The quantity and quality of data required to examine such relationships quantitatively is not available and would be extremely resource-intensive to collect. However, even if such data were available, it would be methodologically challenging to attribute changes in outcomes of interest to Ontario MSSS-funded activities, due to the many factors influencing medical practice and patient safety in the province. It is critical to emphasize that such a challenge of linking organizational activities to long-term outcomes is quite common in evaluation.

Relevance

KEY POINTS

- Medication errors are widespread in health care, both in Ontario and in Canada more generally; harmful errors can significantly affect patient health outcomes, and the cost and quality of health care delivery.
- ISMP Canada contributes to addressing barriers encountered by health care organizations in implementing medication safety improvements by: collecting and analyzing data about medication incidents; developing recommendations and evidence-based solutions to address safety issues; and offering knowledge products and services which share learning and tools with stakeholders.
- Well over nine in ten survey participants (93%) responded that there is convincing evidence of an ongoing need for ISMP Canada activities; this represents the opinions of stakeholders from across the continuum of health care delivery, from decision makers through to front-line workers responsible for the delivery of care to patients.
- ISMP Canada's CMIRPS activities align well with MOHLTC and provincial priorities.

It is well-documented that medication errors are widespread in health care — both in Ontario and in Canada more generally — and that some harmful errors can significantly affect patient health outcomes, as well as the cost and quality of care delivery. However, health care organizations commonly experience barriers to implementing medication safety improvements, such as scarcity of resources, lack of awareness, lack of understanding or engagement, individual or organizational resistance to change, and real or perceived cultures of blame that may result in hesitation to report medication errors. Additionally, current economic conditions may be significantly reducing opportunities for knowledge transfer and diffusion of innovations in patient safety. Most health care organizations would not, by themselves, be able to maintain the expertise and network of contacts necessary to generate such products and services, but even if they did, the result would likely be considerable overlap and duplication.

A large majority of stakeholders believe there is an ongoing need for ISMP Canada and its Ontario MSSS activities, with many referring to ISMP Canada's unique leadership and expertise in the field of medication safety, and the absence of other organizations providing similar products and services. This is clearly demonstrated by the stakeholder survey, in which well over nine in ten stakeholders (93%) responded that there is convincing evidence of an ongoing need for ISMP Canada activities. This evidence represents the opinions of stakeholders from across the continuum of health care delivery, from decision makers through to front-line workers responsible for the delivery of care to patients.

ISMP Canada facilitates implementation of medication safety improvements by focusing on collecting information about medication incidents from a large number and wide variety of stakeholders, analyzing and interpreting the results, collaborating with experts and stakeholders to develop recommendations and evidence-based solutions, and disseminating learnings to health care practitioners and consumers through a variety of channels. ISMP Canada's approach to medication safety is consistent with the patient safety literature, which encourages addressing medication incidents by focusing less on the failure of individuals than on the shortcomings of

the system in which they operate — that is, by focusing on designing systems for medication prescription, dispensing, administration, and use in which errors are less likely to occur.

ISMP Canada's Ontario MSSS activities align well with MOHLTC and provincial priorities. For example, the passing of the *Excellent Care for All Act* (*ECFAA*) in 2010 demonstrated the priority placed by the provincial government on monitoring and reporting to Ontarians on health system outcomes, supporting continuous quality improvement in the delivery of health care, and promoting provision of evidence-based care by establishing Health Quality Ontario (HQO), an arms-length agency of the Ontario government; for instance, ISMP Canada's contribution to the development of an indicator for medication reconciliation on admission is expected to help hospitals meet the *ECFAA* requirement to report publicly on key patient safety measures in their annual quality improvement plans (QIPs). ISMP Canada's activities over the evaluation period have clearly contributed to each of these objectives. In addition, improved quality of care delivery, better patient outcomes, and increased health care system sustainability, all of which are identified as important goals in the Province's 2012 Action Plan for Health Care, are also expected outcomes of ISMP Canada activities carried out as part of the Ontario MSSS.

Implementation

KEY POINTS

- Resources provided by the MOHLTC in FY 2010–11 and 2011–12 were commensurate to intended Ontario MSSS activities, which were generally implemented as planned during the evaluation period.
- Divergences between planned and actual activities were primarily attributable either to factors over which ISMP Canada has limited control, or to strategic decisions undertaken with the aim of positioning the organization to better achieve its objectives.
- Key success factors for ISMP Canada include continuing to develop recommendations and tools that enable stakeholders to overcome the barriers faced by the latter in implementing medication safety improvements in health care settings.
- ISMP Canada has developed a variety of mechanisms that help support efficient and effective Ontario MSSS delivery; for example, by employing a combination of a full- and part-time staff, as well as consultants and students; involving its senior leadership team in managing projects; and maintaining a favourable work environment, it contains labour and infrastructure costs, maintains organizational flexibility, and ensures retention of knowledge and expertise.

In general, ISMP Canada's Ontario MSSS activities were implemented as planned during the evaluation period. Where activities are known not to have been carried out as planned, this result was primarily attributable either to the influence of factors over which ISMP Canada has limited control, or to strategic decisions undertaken with the aim of positioning the organization to better achieve its objectives. For example, due to realignment of priorities by the MOHLTC, the second and third phases of the planned Narcotics Education Strategy were not carried out, as project resources were instead re-allocated to the Knowledge Translation of Insulin Use Interventions/Safeguards and program evaluation. Similarly, some planned ISMP Canada activities related to discharge medication reconciliation were re-oriented to focus on medication reconciliation at admission, when ISMP Canada observed relatively lower readiness on the part of health care organizations to address the former. A small number of activities not carried out during the evaluation remain ongoing.

The evaluation found that resources provided in FY 2010–11 and 2011–12 were fully allocated to Ontario MSSS activities, and that ISMP Canada managed all divergences by reallocating funding internally. Divergences between planned and actual funding within specific activity areas became pronounced in FY 2011–12, largely because of significant uptake of the MSSA-LTC program, which required ISMP Canada to allocate additional resources to managing the program and providing support for participants. Combined with the finding that Ontario MSSS activities were generally implemented as planned during the evaluation period, evaluation results suggest that resources provided by the MOHLTC were commensurate to the planned activities, in the sense that the funding allocated to ISMP Canada was not more than required to generate the desired outputs. The transition to multi-year funding agreements is likely to promote the efficient use of Ministry resources in carrying out future Ontario MSSS activities by simplifying organizational planning, and by enabling the reallocation of resources previously engaged in re-applying for funding on an annual basis.

In a few instances, ISMP Canada experienced challenges in carrying out Ontario MSSS activities. For example, the medication reconciliation pilot project at Toronto Western Hospital

was unable to collect data on all outcomes of interest due to low patient enrolment in the study, while a second project at William Osler Health Centre initially encountered issues associated with inadequate staffing and "buy-in" from the first chosen target unit within that organization; in the latter case, however, ISMP Canada ultimately met with success after choosing a second target unit, while in the former case, lessons learned from the project are being used to inform externally-funded research. More generally, demonstrating the impact of Ontario MSSS activities on outcomes of interest constitutes an ongoing challenge, although, as noted above, this is a very common issue in evaluation. ISMP Canada sought to address this challenge over the evaluation period by developing a logic model and performance measurement framework for its Ontario MSSS activities, and by exploring opportunities to expand the application of knowledge translation to its activities (e.g., by increasing the use of the Knowledge-to-Action Framework developed by the Canadian Institutes for Health Research [CIHR]).

As with any new initiative or program, the uptake of recommendations and guidelines by health care stakeholders depends on the extent to which the latter can address such barriers as human and financial resource constraints and organizational resistance to change. It is important to note that much of ISMP Canada's work involves identifying such barriers and evidence-based interventions and solutions that seek to address them. Moreover, the existence of barriers does not necessarily imply a lack of success in implementing patient safety improvements; this is particularly true of large-scale, complicated safety solutions requiring long-range planning and foundational work to make the broad system-wide changes needed to achieve significant improvements in medication safety.

ISMP Canada has developed a variety of mechanisms that help support efficient and effective Ontario MSSS delivery by formalizing and standardizing the organization's activities; it is also noteworthy that ISMP Canada develops and revises policies and procedures using ISO 9001 templates and frameworks. ISMP Canada has sought to contain labour and infrastructure costs while increasing organizational flexibility by employing a combination of a full- and part-time staff, as well as consultants and students, and by involving the members of ISMP Canada's senior leadership team in leading projects. In addition, maintaining a favourable work environment has helped ensure retention of knowledge and expertise by minimizing staff turnover.

Effectiveness

KEY POINTS

- Evidence pertaining to changes in the use of mechanisms for reporting medication incidents is mixed. There is some evidence of increased participation in, and formalization of, procedures for incident reporting within the institutional sector (though not in non-institutional settings). There are opportunities to increase both the quality and quantity of mandatory critical incident reports submitted through the NSIR. Concerns about emergence of a "reporting gap" may be premature, but given the importance of incident reporting, this should be carefully monitored.
- ISMP Canada's Ontario MSSS activities have generated a wide range of recommendations, safety solutions, and evidence-based interventions.
- Several lines of evidence suggest high and increasing awareness of medication safety activities; for example, at least nine in ten stakeholders are aware of a wide range of ISMP Canada's activities, such as medication safety workshops and webinars (96%), incident reporting by practitioners (97%), and ISMP Canada Safety Bulletins and Alerts (99%).
- Three quarters or more of survey respondents believe Ontario MSSS activities have helped reduce or prevent harmful medication incidents (77%) and have improved quality of care and patient outcomes (78%), while at least half (55%) believe it has reduced costs and promoted the sustainability of the health care system.
- ISMP Canada has successfully established itself as a key partner in medication safety in Ontario, as evidenced, for example, by the large number of agreements, consultations, and collaborations in which it is involved, as well as by its contribution to policy statements, standards, and guidelines developed by provincial and national health care organizations.
- Although it is difficult to assess whether the organization has succeeded in expanding the scale of its Ontario MSSS activities, the evidence suggests ISMP Canada has made targeted efforts to engage previously underserved types of health care practitioners and settings.
- ISMP Canada products and services are widely used by health care system stakeholders, many of whom have also adapted health care policies, practices, or standards based on ISMP Canada recommendations; for instance, three quarters of respondents reported that they (75%) or their organizations (76%) had implemented specific medication safety practice improvements based specifically on ISMP Canada recommendations or tools. Participation in most activities has increased markedly since 2010, particularly among stakeholders with past exposure to ISMP Canada.
- ISMP Canada has contributed to integration of efforts to promote safe medication practices by offering knowledge products and services that help minimize duplication of effort among its clients, by collaborating extensively with other health care organizations, and by being directly involved in most provincial medication safety initiatives. The design of the Ontario MSSS program, combined with ISMP Canada's specialization in the area of medication safety, means its activities are unlikely to duplicate other organizations.
- While the evaluation was not able to precisely estimate program impact, many health care stakeholders believe Ontario MSSS activities have contributed to ISMP Canada's longer-term and ultimate program outcomes.
- A review of the academic literature suggests that even a small reduction in the frequency of medication incidents would generate savings to the provincial health care system easily exceeding the costs to the MOHLTC of funding ISMP Canada's Ontario MSSS activities.

Immediate outcomes

Well over eight in ten stakeholders (86%) reported that their organizations have either formal policies or expectations around reporting or providing information about medication incidents. Several interviewees expressed concern about the impact of the Ministry directive on the use of mechanisms for reporting medication incidents in Ontario, believing that it might adversely affect both critical and non-critical incident reporting in Ontario. These concerns may have some validity, as ISMP Canada's analysis of critical incidents received between October 1, 2011 and October 1, 2012 identified opportunities for increasing both the quality and quantity of reports submitted through NSIR; however, the data also indicates that the volume of reports submitted to OMID (including critical incidents) actually increased on a monthly basis during the first six months of mandatory reporting, suggesting that concerns about a reporting gap may be premature. Given the critical importance of incident reporting for understanding and addressing medication safety issues in Ontario, ISMP Canada should continue both to closely monitor the situation and to work with its partners to take any steps necessary to identify and address any factors prompted by the transition to mandatory critical incident reporting, which could adversely affect stakeholder willingness to report either critical or non-critical medication incidents.

ISMP Canada's activities for the Ontario MSSS have generated a large number and wide range of recommendations, stemming in large part from findings from incident analyses and aggregate analyses, but also from other sources, such as RCAs, Failure Mode and Effects Analysis (FMEA), and funded projects. Additionally, ISMP Canada has played an important role in developing medication safety solutions, such as tools that facilitate implementation of medication safety practices. Examples of such tools include medication reconciliation forms, indicators, and toolkits for acute, long-term care, and home care settings, the Analyze-Err reporting tool, and the MSSA programs. ISMP Canada's recommendations and safety solutions are useful to stakeholders in helping them meet the requirements laid out in accreditation standards, as well as in provincial regulations. ISMP Canada also contributed subject matter expertise and support for three specific evidence-based interventions during the evaluation period, including the Beers Awareness Campaign, the Narcotics Education Strategy, and, most recently, the Knowledge Translation of Insulin Use Interventions/Safeguards project.

The stakeholder survey found that a large majority of stakeholders are highly aware of many of ISMP Canada's activities; since these activities are intended to share information and knowledge of medication incidents and safe medication practices, this finding suggests that ISMP Canada is contributing to awareness and understanding of medication safety issues and evidence-based safety practices. At least nine in ten stakeholders are aware of ISMP Canada's activities around the Root Cause Analysis (RCA) framework (92%), development and/or facilitation of implementation of medication safety practice improvements (96%), and medication safety workshops and webinars (96%). Nearly all respondents were at least somewhat aware of incident reporting by practitioners (97%) and ISMP Canada Safety Bulletins and Alerts (99%). Awareness of nearly all activities appears to have increased moderately since the 2010 evaluation. Some evaluation findings also suggest that ISMP Canada activities have increased stakeholder understanding medication safety issues and evidence-based safety practices; for example, survey results indicate that more than four in five stakeholders believe these activities have facilitated the identification of medication safety issues and the identification, development, and implementation of potential solutions. Additional evidence of increased understanding of evidence-based safety practices may be derived from an

analysis of MSSA program scores for provincial long-term care facilities, which indicates significant improvements between 2009 and 2012.

Although the evaluation results generally suggest increased stakeholder awareness and understanding of medication safety issues and evidence-based safety practices, several interviewees suggested this may vary between different groups of health care practitioners and health care settings. For example, some stakeholders described awareness and/or understanding as low among government/regulators, physicians, home care workers, and the public (relative to other types of stakeholders), and as high in hospitals and long-term care homes (relative to non-institutional settings). This observation is supported by some of the results from the stakeholder survey, which found slight differences in awareness and understanding across health care settings and professions. For example, the findings suggest nurses may have relatively lower levels of awareness of some ISMP Canada activities than pharmacists or hospital executives/administrators; similarly, awareness may be somewhat higher among health care practitioners working in community hospitals than among those working in teaching hospitals or nursing homes/long-term care facilities.

The evidence suggests that ISMP Canada has generally been successful in establishing itself as a key partner in medication safety in Ontario. Although a few interviewees believe ISMP Canada's profile as an organization remains low, they typically describe ISMP Canada as a key partner in medication safety due to its leadership, expertise, and reputation as a credible, respected, and reliable source of information on medication safety. This perception is supported by the large number of agreements and consultations ISMP Canada maintains with other provincial organizations that pertain to medication safety issues, as well as by its participation in numerous collaborative projects over the evaluation period. Other evidence of recognition of ISMP Canada as a key partner in medication safety is its contribution to policy statements, standards, and guidelines developed by Ontario-based health care organizations, as well as to Required Organizational Practices (ROPs) developed by Accreditation Canada. As many Ontario facilities participate in Accreditation Canada programs, the potential to improve medication safety in Ontario through influencing ROPs is immense.

Intermediate outcomes

From a quantitative standpoint, evidence on changes in the scale of ISMP Canada's Ontario MSSS activities is inconclusive. Participation in the MSSA program in the long-term care setting increased substantially over the evaluation period, as did the volume of monthly reporting received through the OMID; however, activity data suggests that dissemination of ISMP Canada and ISMP US knowledge products may have declined slightly between FY 2010–11 and 2011–12. It should be noted that the mandatory reporting requirement appears not to have reduced the volume of voluntary reports submitted to OMID over the evaluation period, as some stakeholders feared would happen. Although participation in Ontario MSSS-supported workshops, webinars, presentations, and medication safety conferences appears to be significant, as is involvement in Accreditation Canada programs (which, as noted above, are heavily influenced by ISMP Canada activities), trends either cannot be assessed from the available data (e.g., there is only a single data point), or are of uncertain significance. From a qualitative standpoint, the evidence suggests that over the evaluation period, ISMP Canada made targeted efforts to engage several groups of health care practitioners and to address some health care settings that stakeholders perceive as underserved.

Several lines of evidence indicate widespread use by health care system stakeholders of ISMP Canada products and services, as well as adoption of changes to health care policies, practices, or standards based on ISMP Canada recommendations. For instance, recent data from on-site surveys carried out by Accreditation Canada suggests widespread compliance with several ROPs that align with (and in many cases were influenced by) ISMP Canada guidelines and recommendations. Similarly, interviewees generally perceived the uptake of ISMP Canada-recommended evidence- and systems-based medication safety improvements to be increasing, describing increasing participation in the MSSA program; higher uptake of medication reconciliation recommendations, tools, indicators, and interventions; and increased willingness to report medication incidents.

Results from the stakeholder survey also indicate widespread use of ISMP Canada's products and services, although this tends to be higher in institutional settings, and among stakeholders with more past exposure to the organization. Half or more of respondents' organizations report or share information about medication incidents with ISMP Canada (50% of both recent and long-standing clients), and use MSSA modules (56% of both recent and long-standing clients) and medication reconciliation toolkits (60% and 56%, respectively). Furthermore, at least seven in ten respondents' organizations (70% and 78%, respectively) have participated in medication safety workshops and webinars, three quarters (76% of both groups) have implemented specific medication safety practice improvements based on ISMP Canada recommendations or tools, and well over four fifths (87% and 92%) receive bulletins and alerts from ISMP Canada. It should be noted that these results significantly understate participation in ISMP Canada activities, as they do not apply to all organizations responding to the survey.[1] It is also noteworthy that participation in most of these activities has increased markedly since 2010, particularly among stakeholders with past exposure to ISMP Canada.

ISMP Canada recommendations have also affected formation of policies, practices, or standards in many respondents' organizations. For example, at least half of respondents reported changes resulting from ISMP Canada recommendations related to heparin (51% and 61% of recent and long-standing clients, respectively) or narcotic/opioid agents (53% and 67%, respectively), while two thirds or more made changes due to recommendations related to medication reconciliation (67% and 71% of recent and long-standing clients, respectively) and dangerous abbreviations/ symbols/dose designations (73% and 79%, respectively). Again, these values underestimate the true impact of ISMP Canada recommendations because the latter are not equally applicable to all health care settings.

The evaluation found that ISMP Canada has been successful overall in contributing to integrating efforts to promote safe medication practices with other organizations. One means of accomplishing this objective is to engage in activities that help minimize duplication of effort across organizations, for example by developing knowledge products which health care stakeholders can readily adapt to their own purposes, thereby eliminating the need for each stakeholder to prepare such products individually. Other evidence of integration is provided by ISMP Canada's extensive collaborative network with provincial and national organizations and professional associations, as well as with government departments/agencies and international organizations, which demonstrates a clear effort to create synergies and avoid duplication. Indeed, the structure of the Ontario MSSS itself (e.g., the selection of initiatives through dialogue

[1] For example, direct participation in many ISMP Canada activities would probably not be useful for stakeholders in Ontario universities or government departments.

with the MOHLTC and provision of program guidance by an Advisory Group consisting of key provincial stakeholders) significantly reduces the likelihood of duplication with the activities of other organizations. Finally, unique expertise within the area of medication safety, combined with its direct involvement in most, if not all, medication safety initiatives carried out at the provincial level, ensure that its activities will primarily or even wholly complement activities carried out by other stakeholders.

Long-term and ultimate outcomes

Stakeholder survey results suggest more than three quarters (77%) of respondents believe that participation by their organizations in ISMP Canada activities has contributed to a reduction in the occurrence of harmful medication incidents (by contrast, in 2010 only 61% of respondents believed ISMP Canada activities had had this effect). One reason for this belief may be the perception by more than eight in ten stakeholders that participation in ISMP Canada activities had enabled their organizations to more effectively recognize potential medication safety problems and to identify, develop, and implement preventative strategies.

Some interviewees also stated that although it is very difficult to estimate the impact of Ontario MSSS activities on the reduction and prevention of harmful medication incidents, it is entirely reasonable to expect that the activities would have this effect, with many believing that there might be a higher frequency of medication incidents in the province if they had not been undertaken. A few offered anecdotal evidence that participation in ISMP Canada activities or implementation of ISMP Canada recommendations had enabled them to prevent some medication errors. ISMP Canada's participation in the MMSS Program at the Central Community Care Access Centre (CCAC) is particularly noteworthy, as an evaluation of that program identified significant reductions in the occurrence of medication discrepancies and issues as a result of the intervention.

More than three quarters of survey respondents (78%) believed that organizational involvement in ISMP Canada activities had improved quality of care and patient outcomes, while over half (55%) believed it had contributed to a reduction in costs associated with harmful medication incidents and to the sustainability of the health care system. As with the occurrence of medication incidents, many stakeholders argued that although the relationship would be very difficult to measure, it is entirely reasonable that participation in Ontario MSSS activities led by ISMP Canada would affect quality of care, patient outcomes, and health care costs.

There is strong evidence to show that successfully reducing the frequency of medication incidents would improve both quality of care and patient outcomes; for example, between January 2010 and September 2011 alone (a 21-month period), OMID records 299 cases of patient harm, as well as 17 deaths; additionally, 15 critical incidents were reported to CIHI through NSIR from October 1, 2011, to October 1, 2012, including 5 resulting in death. Review of the literature and the available documentation also identified several examples of how common medication errors can result in patient harm and/or death. The literature clearly suggests that even a small reduction in the frequency of medication incidents would generate savings to the health care system easily exceeding the costs to the MOHLTC of funding ISMP Canada's Ontario MSSS activities. Accounting for other considerations, such as productivity losses stemming from short- or long-term health impacts associated with medication errors, adds still more weight to this conclusion.

Efficiency and economy

KEY POINTS

- ISMP Canada has implemented several strategies to maximize efficient use of resources; for example, it employs approaches to staffing that minimize labour and infrastructure costs, and applies knowledge and expertise acquired from past work to inform the design and/or implementation of new projects or programs.
- ISMP Canada has succeeded in leveraging additional resources from its Ontario MSSS-funded activities by taking advantage of concurrently-funded projects (most notably through CMIRPS), sharing costs with project partners, and providing fee-for-service knowledge translation products and services.
- The cost of ISMP Canada's Ontario MSSS activities between FY 2010–11 and 2011–12 ($1.8 million), plus the costs of making changes to the health care system to increase medication safety, are likely much less than the estimated value of averting premature deaths over the same period ($38.6 million).
- Ontario MSSS activities have brought value to health care stakeholders and to their respective organizations in several ways. There is considerable value for the provincial government in maintaining this capacity to respond to or proactively address medication safety issues, an objective to which the MOHLTC's support for the Ontario MSSS contributes.

ISMP Canada has implemented several strategies to maximize efficient use of resources, including drawing on a combination of full- and part-time staff, as well as consultants and students, and involving members of ISMP Canada's senior leadership team in leading projects. These strategies help to minimize labour and infrastructure costs. In addition, maintaining a favourable work environment has helped ensure retention of knowledge and expertise by minimizing staff turnover. Another example of the consideration of efficiencies is the application of a strategy employed by ISMP Canada whereby knowledge and expertise from one project or program is used to inform the design and/or implementation of other projects or programs, which improves effectiveness and reduces project costs.

There are many examples of how ISMP Canada's Ontario MSSS activities leverage resources from federal and/or non-governmental sources, or vice versa. Indeed, the documentation suggests that CMIRPS funding provided by Health Canada enables ISMP Canada to undertake Ontario MSSS activities at costs far below what would otherwise be possible. For instance, CMIRPS incident reporting provided much of the information used to undertake the Ontario MSSS-funded updates of the Medication Safety Self-Assessment (MSSA) modules for long-term care and community/ambulatory pharmacy, which likely reduced the resources required to undertake that activity.[2] A significant example of leveraging of non-governmental resources is the Ministry-funded medication reconciliation pilot project at two facilities within the William Osler Health Centre; in addition to in-kind resources provided by William Osler Health Centre to support the project over the evaluation period, its senior management has since decided to extend the

[2] As another example, since the technological and organizational infrastructure required to collect, maintain, and protect medication incident data is similar for both CMIRPS and the OMID, associated infrastructure, and privacy and policy development costs, can be shared between Health Canada and the MOHLTC.

benefits of the project to patients beyond the funding period by hiring additional staff to sustain the initiative into the future.

The analysis suggests that the cost of ISMP Canada's Ontario MSSS activities between FY 2010–11 and 2011–12 ($1.8 million), plus the costs of making the changes to the system (e.g., activities involved in diagnosing causes of the error, developing information bulletins, associated outreach, and changing practices), are likely much less than the estimated value of averting premature deaths over this period ($38.6 million). Furthermore, these costs do not include the value of reducing the other costs of mitigating errors (intensive care and other hospital procedures, lost time at work, and effects on quality of life), and consider only a small number of medication error types.

Supplementing the value for money calculations, stakeholders also described several ways in which Ontario MSSS activities had brought value to them and to their respective organizations, such as increasing awareness and understanding of medication incidents and safety-based medication practices, and stimulating a culture shift towards increased accountability and prioritization of patient safety. From a regulatory standpoint, there is considerable value for the provincial government in maintaining the capacity to respond to or proactively address medication safety issues, an objective to which the MOHLTC's support for the Ontario MSSS contributes.

List of Acronyms	
Acronym	**Definition**
ACE	Antiotensin-converting enzyme
BPMD	Best Possible Medication Discharge
BPMH	Best Possible Medication History
CAES	Canadian Adverse Events Study
CARN	Canadian Adverse Reaction Newsletter
CCAC	Community Care Access Centre
CCMIRP	Canadian Coalition on Medication Incident Reporting and Prevention
CCO	Cancer Care Ontario
CEU	Continuing Education Unit
CIHI	Canadian Institute for Health Information
CIHR	Canadian Institutes for Health Research
CMIRPS	Canadian Medication Incident Reporting and Prevention System
CoP	Community of Practice
CPhIR	Community Pharmacy Incident Reporting
CPSI	Canadian Patient Safety Institute
CPSO	College of Physicians and Surgeons of Ontario
DER	Drug error reduction
DVT	Deep vein thrombosis
ECFAA	*Excellent Care for All Act*
ENT	Ear, Nose and Throat
FMEA	Failure Mode and Effects Analysis
GIM	General internal medicine
HARM	Hospital Admissions Related to Medication
HQO	Health Quality Ontario
ICES	Institute of Clinical Evaluative Sciences
ICU	Intensive Care Unit
IMSN	International Medication Safety Network
IPR	Individual Practitioner Reporting
ISMP	Institute for Safe Medication Practices
LTC	Long-term care
MOHLTC	Ministry of Health and Long-Term Care (Ontario)
MOU	Memorandum of Understanding
MMSS	Medication Management Support Services
MSSA	Medication Safety Self-Assessment program
MSSA-CAP	MSSA programs for community/ambulatory pharmacy
MSSA-LTC	MSSA programs for long-term care
MSSS	Medication Safety Support System
NMBA	Neuromuscular Blocking Agents
NSAIDs	Nonsteroidal anti-inflammatory drugs
NSCPS	National Steering Committee on Patient Safety
NSIR	National System for Incident Reporting
OANHSS	Ontario Association of Non-Profit Homes and Services for Seniors
OCP	Ontario College of Pharmacists
ODB	Ontario Drug Benefit
ODPRN	Ontario Drug Policy Research Network
OHA	Ontario Hospital Association
OHQC	Ontario Health Quality Council
OLTCA	Ontario Long-Term Care Association
OMID	Ontario Medication Incident Database

List of Acronyms	
Acronym	**Definition**
Ontario MSSS	Ontario Medication Safety Support Service
ORNAC	Operating Room Nurses Association of Canada
ORNAO	Operating Room Nurses Association of Ontario
ORNAT	Operating Room Nurses Association of Toronto
PDSA	Plan-Do-Study-Act
PPC	Pharmacy Practice Conference
QHN	Quality Health Network
QIP	Quality improvement plans
RCA	Root Cause Analysis
ROP	Required Organizational Practice
SHN	Safer Healthcare Now!
SHRTN	Senior's Health Research Transfer Network
SOP	Standard Operating Procedures
TBS	Treasury Board Secretariat of Canada
TWH	Toronto Western Hospital
UHN	University Health Network
VTE	Venous thromboembolism
WHO	World Health Organization