Lessons learned from 3 attempts to use data sources to evaluate pharmacist prescribing in Ontario

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Introduction

Recognizing their unique, widely accessible position in community pharmacies and expertise in drug knowledge, Canadian and international community pharmacists have taken on expanded roles in health care delivery, including prescriptive authority. The level of authority varies per jurisdiction, broadly categorized as dependent or independent prescribing depending on the level of autonomy afforded to pharmacists. The former requires pharmacists' prior authorization from a prescriber, known as "Collective Agreements" in the United States, "Supplementary Prescribing" in the United Kingdom, or "Delegated Authority" in Ontario, Canada.¹ Independent prescribing, on the other hand, provides pharmacists with the legal authority to prescribe, and this can be in the form of managing existing drug therapy as well as initiating drug therapy.

The Ontario government approved the Regulated Health Professions Statute Law Amendment Act (Bill 179) in December 2009 with the intention of increasing patients' access to care through expanded scopes of practice of 11 regulated health professionals, including pharmacists. The regulations within this bill were passed on October 9, 2012, granting pharmacists independent authority to prescribe medications that were specified within the regulations and modify, adapt and renew existing prescriptions. This excluded narcotics, controlled drugs, targeted substances and monitored drugs. Before renewing or adapting a prescription, pharmacists are expected to assess the patient's medical history and other relevant circumstances to establish that the prescribed medication is safe and effective.

Despite having the authority for a renewed full scope of pharmacy practice in Ontario since 2012, the uptake and perceptions of this prescriptive authority have not been evaluated.

The Ontario Pharmacy Evidence Network (OPEN) was awarded an Ontario Ministry of Health and Long-Term Care Health System Research Fund program grant between 2013 and 2016 to, in part, determine the uptake and impact of independent prescribing by Ontario community pharmacists, including the influencing factors and implications for the future.

To address this goal, the OPEN prescribing team undertook a series of projects: 1) a scoping review of the public's and patients' perspectives of pharmacist prescribing,¹ 2) qualitative interviews exploring pharmacy users' views about pharmacist prescribing,² 3) data feasibility pilot studies (discussed here), 4) a large-scale survey of Ontario's community pharmacists (publication forthcoming) and 5) environmental scans and stakeholder consultations about future prescribing models.^{3,4} Multiple strategies were employed to evaluate community pharmacists' prescription renewals or adaptations. The team found it more challenging than expected to obtain pharmacist-level intervention data about the uptake and types of nonreimbursed pharmacist prescribing services in Ontario. This article describes lessons learned from the OPEN prescribing team's data feasibility studies and presents recommendations for how data can be captured and managed to more effectively allow for future descriptions of community pharmacists' uptake of their authority to renew and adapt prescriptions.

Data sources explored

Administrative claims data from the Ontario Drug Benefit program

In the first effort, attempts were made to determine how many administrative claims were submitted by community pharmacists for renewals and adaptations to the Ontario Drug Benefit (ODB) program. In Ontario, the Institute for Clinical and Evaluative Sciences (ICES) is responsible for storing and managing much of the publicly funded administrative health services records for the Ontario population. Unfortunately, it is not currently possible to link pharmacist license numbers with these data; therefore, administrative data held at ICES could not be used to explore questions related to pharmacist prescribers. Alternatively, the data were obtained from the Drug Program Branch of the Ministry of Health.

The ODB program, administered by the Ontario government, provides medication coverage for nearly 30% of Ontario residents, including adults over the age of 65, residents of long-term facilities and those receiving social or disability assistance.⁵ Claims for eligible medications and government-funded pharmacy services are adjudicated electronically through the Ontario Drug Benefit Health Network System (HNS) and paid directly to the community pharmacy. Submitting a claim for a professional pharmacy service requires the completion of particular data fields within the HNS, including an intervention code for a Professional Care Service (Professional Care Service PIN) and a pharmacist identification (ID) code in the prescriber field.

Two aggregate claim reports were provided to the OPEN prescribing team by the Ontario Ministry of Health and Long-Term Care:

1. “Overall” claims data, including all claims for which any health care professional was documented as a prescriber in the HNS that occurred between April 2011 and March 2013.
2. “Pharmacist” claims data, including claims for which a pharmacist ID was submitted as the prescriber within the HNS that occurred between April 2011 and June 2013. Pharmacists identified themselves as prescribers in the HNS when billing.

Prior to the regulations allowing pharmacists to renew and adapt prescriptions (enacted

in October 2012), pharmacists identified themselves as prescribers in HNS primarily when submitting claims for government-funded pharmacy services. These include MedsCheck (initial and follow-up visits for each of the 4 MedsCheck services: Annual, Living with Diabetes, At Home and Long-Term Care), Pharmaceutical Opinions, smoking cessation services and influenza vaccinations, each of which has an assigned Professional Care Service PIN in HNS. After October 2012, these claims remained easily distinguishable from claims for renewals and adaptations within this data set because the act of prescribing by a pharmacist is not a government-funded service in Ontario and, as such, has no affiliated Professional Care Service PIN. From the pharmacist claims data, approximately 400,000 claims were submitted to the HNS between October 2012 and June 2013 without a Professional Care Service PIN. However, further delineation of claims was not possible for renewals versus adaptations, which limited the usefulness of the data set for addressing the objectives.

Challenges identified:

- Pharmacist license numbers were not linkable to health service records available through ICES.
- No Professional Care Service PIN for pharmacist renewals and adaptations: Since prescribing services for renewals and adaptations are not remunerated by the province, no professional care service PIN exists, and, as such, renewals and adaptations cannot be distinguished within Ontario’s provincial claims databases.

Pharmacy record audit

To advance the objective of estimating the frequency in which pharmacists were renewing and adapting prescriptions, the feasibility of using pharmacy dispensing records as a data source was explored. To determine feasibility, the following were needed to understand the types of data available through pharmacy dispensing records: the logistics of gathering, cleaning and analyzing the data, as well as the resources (time and fiscal) that would be required to conduct a provincial study using this data source.

First, a partnership was formed with 2 community pharmacies (1 franchise and 1 independently owned) in the Greater Toronto area. Pharmacies with divergent characteristics

were purposely sought with respect to ownership model, volume of prescriptions dispensed (approximately 255 vs 75 prescriptions per day) and dispensing software. Both pharmacies reported having 1 pharmacist and 2 assistants regularly scheduled during opening hours. Data covering prescriptions dispensed over a 6-week period (May 27 to July 8, 2014) were obtained. Pharmacies were sent the requirements for participating in advance, and a modest honorarium to offset staff time spent assisting the research assistant was provided. Research ethics board approval was obtained from the University of Toronto, and the pharmacy managers provided written consent prior to participation.

During the scheduled visit, the research assistant, who had experience as a community pharmacy assistant, collected information about pharmacy characteristics and pharmacy-specific documentation format, practices and storage for prescription adaptations and renewals. At the time of data collection, neither pharmacy was electronically storing original prescriptions and associated documentation. Furthermore, neither of the dispensing software systems prompted pharmacists to enter a rationale for prescribing when they entered themselves as prescribers. A pharmacy staff member generated a list of transactions where pharmacists identified themselves as the prescriber in the prescriber data entry field of dispensing software. As such, these transactions involved any pharmacist-initiated service that was billed through the dispensing software, including renewals and adaptations, but also claims for MedsCheck, Pharmaceutical Opinions and influenza vaccinations, which were subsequently excluded by the research assistant. Existing records and accompanying paperwork for all transactions (also commonly referred to as prescription hard copies) assumed to pertain to renewals and adaptations were retrieved, photocopied and deidentified.

From each transaction record, patients' birth year, sex, the number of days for which a medication was supplied and the name and dose of the medication were collected. To further elucidate the situations in which renewals and adaptations occurred, the medication from each transaction was categorized into corresponding American Hospital Formulary Service (AHFS) Pharmacologic-Therapeutic Classification therapeutic classes, and rationale for prescribing was recorded when available. To evaluate the

feasibility of a larger-scale audit in more pharmacies, the duration of each data collection step (i.e., time to run the transaction report, time to retrieve accompanying documentation and time to input the data into a statistical software program) was documented to assess the efficiency of this process.

Through examination of 12 transactions at the first pharmacy and 75 transactions at the second, as well as the accompanying documentation where the pharmacist was identified as the prescriber, it was determined that all transactions involved renewals (i.e., no adaptations were found). For the pharmacy with 12 renewals, data collection took approximately 3 hours, whereas collection for 75 renewals took approximately 19 hours. Pharmacy managers at both pharmacies reported that they record themselves as the prescriber in the pharmacy software system when an independent renewal or adaptation is performed and that they notified the original prescriber as required by legislation each time they prescribed. To the best of their knowledge, this was how every pharmacist practised at their sites, although managers were less certain about how adaptations versus renewals were handled. The most commonly renewed AHFS therapeutic class was cardiovascular drugs, and a supply of 30 days was most commonly provided to patients in both pharmacies. The pharmacy with higher prescription volume produced double the amount of renewals, but renewals accounted for less than 1% of prescription volume in both pharmacies. Incomplete documentation on some prescription hard copies (e.g., rationale for renewal) was also identified as an issue. Since the time and effort required to collect the data were high, particularly in light of the low number of renewals and adaptations identified, the team deemed that a larger-scale audit involving more pharmacies was not a responsible use of limited project time and resources.

Challenges identified:

- **Incomplete documentation:** Some prescription hard copies had incomplete documentation (e.g., rationale for renewal), and a search for additional documentation was required. Potential reasons for the incomplete documentation may have included the absence of a standardized documentation form for pharmacist-initiated renewals and the lack of time available to allow for proper documentation.

TABLE 1 Availability of desired data fields within “pharmacist prescribing” modules

Category	Available at time of audit	Unavailable at time of audit
Patient	Unique identifier, gender, birth year, postal code	
Pharmacy	Unique identifier, postal code	Mean daily prescription volume
Prescription	Unique identifier (prescription number); date of prescription; drug identification number; American Hospital Formulary Service classification; medication name, strength, route of administration; number of refills for last filled prescription; quantity authorized for last filled prescription	
Renewal	Reason for renewal; quantity authorized by pharmacist; quantity dispensed; patient does not have a primary care provider (yes/no); method of notification of primary care provider (phone/fax/other)	Days' supply authorized by pharmacist
Adaptation	Type of adaptation, quantity authorized by pharmacist; notification of prescriber (yes/no); method of notification of prescriber (phone/fax/other)	Days' supply authorized by pharmacist; patient does not have a primary care provider (yes/no)
Prescriber		Unique identifier; credentials; postal code

- Resource intensive: This feasibility study was resource intensive, requiring both the research assistant's extensive expertise as a pharmacy assistant and time. Although the ability to produce computer-generated reports streamlined the data collection process, the data extraction from the prescription hard copies was time-consuming.
- No adaptations: We were unable to identify documentation for any adaptations at either pharmacy.

Pharmacy clinical documentation records

Last, OPEN partnered with OnPharm, Inc., which supports 230 independent Ontario pharmacies, and Pharmacy Access Solutions, Inc. (PASI), a database vendor, to determine whether a review of pharmacist clinical documentation was a feasible approach for estimating uptake of pharmacist renewals and adaptations. OnPharm, Inc. and PASI developed an electronic “pharmacist prescribing” module for OnPharm, Inc. member pharmacists to record activities beyond traditional dispensing, including services related to renewals and adaptations.

A list of desired variables was created to extract specific data from this module and assess whether these variables helped inform our research question about uptake of renewals and adaptations. In consultation with PASI and OnPharm, Inc., after developing a data-sharing

agreement and receiving research ethics board approval from the University of Toronto, the OPEN research team was supplied a data file, including all renewals and adaptations recorded in the e-modules since inception of the system from February 2014 to March 2015. Table 1 describes the availability of data fields from PASI and OnPharm, Inc.

Descriptive analyses of available variables were undertaken. Results revealed that 8 pharmacists in 2 postal codes used the documentation modules over the data collection period of 1 year. The vast majority of records documented renewals (550/555, 99.1%), and most of these were requests for 1 medication only (vs request to renew multiple medications) (68.5%); 83.5% of renewals were indicated as an emergency supply. Out of the 267 unique patients receiving renewals, the mean (SD) age was 62.5 (18.9; range, 4-100) years, and 55.4% were female. Statins were the most frequently renewed type of medication, followed by serotonin-related medication and proton pump inhibitors. As expected, this is consistent with the most frequently prescribed drug classes by physicians and nurse practitioners in Canada.⁶

Challenges identified:

- Limited sample size: Only 2 pharmacies and 8 pharmacists used the “prescribing module,” which precludes any estimates of

the uptake of renewals and adaptations in independently owned community pharmacies. Enhanced use of the documentation modules by pharmacists in a greater number of jurisdictions is required before provincewide hypotheses can be generated.

- Capturing sufficient data: Changes to the documentation modules would be required to increase the usefulness of data collected about renewals and adaptations for research purposes. Examples of system enhancements could include capturing the days' supply of medication authorized by the pharmacist and the capacity to capture details about multiple renewals when they are issued in one encounter.

Lessons learned

Despite our best efforts, the 3 strategies used to estimate the uptake of and characterize the renewal and adaptation behaviour of Ontario community pharmacists were not successful. This was disappointing to many, but particularly to knowledge users (government policy makers and nongovernmental pharmacy organizations) eager to understand the impact of new regulations permitting pharmacist renewals and adaptations on pharmacy practice, patients and the health system.

Table 2 presents recommendations arising from each study conducted. The recommendations arising from these attempts can be broadly categorized as those focused on process (i.e., what prescribers do) and data structures (i.e., existence of and data entry into particular data fields). While an increasing number of pharmacies are now scanning paper copies of prescriptions into dispensing systems, which may further expedite the retrieval process for a dispensing record audit somewhat, it does not mitigate 2 additional considerations that arose during these projects.

First, no adaptations were identified in our audit of pharmacy dispensing records. This was unexpected and raises important future research and policy questions about whether or when pharmacists apply prescriptive authority for adaptations. The ODB program funds the Pharmaceutical Opinion Program (POP), where pharmacies can be remunerated for identifying drug therapy problems and corresponding with prescribers about their recommendations for change to patients' medication therapy. Under their adaptation authority, pharmacists can make

changes to dose, route, regimen and formulation of a prescription and then notify the prescriber afterwards. Within the POP, recommendations are sent to the prescriber, and a reply must be received for the claim to be eligible for billing. It is unclear how pharmacists are making decisions about when to adapt prescriptions versus render a pharmaceutical opinion.

Second, an observation arising through this work is that pharmacists may not always be entering themselves as prescribers in the appropriate data fields, whether that means not entering their own license number in the prescriber field in the HNS or not recording themselves in dispensing software as prescribers. This may be because of difficulties in using the dispensing software; however, it may also be that pharmacists are not recording themselves as prescribers, despite the legal requirement in Ontario to do so, because they do not consider adapting and renewing prescriptions to be prescribing activities. This complicates attempts to estimate the frequency of pharmacist renewing and adapting because findings would likely underestimate this frequency.

Despite the challenges faced by our team, mechanisms to evaluate how changes in health policy affect medication management are critically important. In an environment of increasing accountability for all health professionals and limited health system resources, it is imperative that systems to record and gather data be incorporated into program implementation so that evidence of uptake and effect can be regularly assessed.

Conclusions

Three unsuccessful attempts were made to describe the uptake of pharmacist prescribing by authorizing renewals and adaptations in Ontario community pharmacies. The current available data sources did not allow for an accurate depiction of this expanded role for pharmacists. Renewals were documented much more frequently than adaptations, limiting any description of adaptations. It became evident that pharmacists may not be recording themselves in dispensing software as prescribers. Recommendations for enhancements to the process of documenting prescribing and data structures within existing software are made. Most important, policy makers and advocacy organizations must develop evaluation plans and incorporate mechanisms for data collection before new pharmacy services are implemented. ■

TABLE 2 Summary of challenges and recommendations

Data source	Challenge	Recommendation
Health Administrative Data	1. Pharmacist License Number not linkable to existing health services records	Pursue data linkages between Ontario College of Pharmacists and ICES.
	2. No Professional Services PIN for renewals and adaptations	Explore the creation of Professional Services PINs for services not reimbursed by the government that could be used for tracking workload.
	3. Pharmacists not documenting themselves as the prescriber	Embrace opportunities to clarify pharmacist documentation responsibilities through Ontario College of Pharmacists–affiliated professional development opportunities, including Practice Advisor program (done).
Pharmacy Records Audit	1. Incomplete documentation (i.e., rationale for renewal, missing patient information)	Develop a standardized documentation template for independent renewals. Use pharmacy software functions (when available) that prompt the user for a rationale for prescribing prior to allowing the transaction to be completed.
	2. Resource intensive (expertise and time)	Consider prospective data collection for a period of time: recruit support staff (e.g., pharmacy technicians and assistants) to record the occurrence of pharmacist renewals and adaptations.
	3. Did not capture any independent adaptations	Pursue additional research exploring use of Pharmaceutical Opinion program (for which pharmacies can be remunerated) for adaptations for eligible patients. Embrace opportunities to clarify pharmacist documentation responsibilities through Ontario College of Pharmacists–affiliated professional development opportunities, including the Practice Advisor program. This has been accomplished through OPEN’s knowledge translation efforts.
Pharmacy Clinical Documentation Records Audit	1. Not enough pharmacies/pharmacists used the “prescribing module” for the data to be accurately extrapolated	Explore incentives to encourage use of the “prescribing module” (e.g., financial, professional recognition).
	2. Content captured by the modules not comprehensive	System enhancements could be considered, including capturing the days’ supply authorized by the pharmacist and the capacity to capture when multiple renewals occur in one encounter.

ICES, Institute for Clinical and Evaluative Sciences; OPEN, Ontario Pharmacy Evidence Network.

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