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Development of practice-based quality indicators for the primary care of older adults: a RAND/UCLA Appropriateness Method study protocol

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ABSTRACT

Introduction Older adults have high rates of primary care utilisation, and quality primary care has the potential to address their complex medical needs. Family physicians have different levels of knowledge and skills in caring for older patients, which may influence the quality of care delivery and resulting health outcomes. In this study, we aim to establish consensus on practice-based metrics that characterise quality of care for older primary care patients and can be examined using secondary, administrative data.

Methods and analysis We describe a two-round RAND/ UCLA Appropriateness Method (RAM) study to assess the consensus of a technical expert panel. We will recruit pan-Canadian experts who demonstrate excellence in clinical practice or scholarship related to the primary care of older adults. A literature review will generate a candidate list of practice-based quality indicators. The first round aims to evaluate the appropriateness and importance of candidate indicators through an online questionnaire. We will then develop technical definitions for each endorsed indicator using ICES data holdings. Panellists will offer feedback on the technical definitions in a virtual synchronous meeting and provide ratings on the same criteria in a second questionnaire.

Ethics and dissemination Our study has been approved by the Hamilton Integrated Research Ethics Board (Project ID #15545). Findings will be disseminated via manuscripts, presentations and the lead author's thesis.

Trial registration number ISRCTN17074347

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ We are recruiting pan-Canadian, multidisciplinary experts with extensive knowledge about primary care provision for older adults to gather diverse perspectives about this heterogeneous patient population and primary care delivery in different contexts.
⇒ Our initial set of candidate quality indicators will be informed by the literature to understand the state of indicator development, methodological quality and current gaps in indicator availability. In addition, we will provide an opportunity for panellists to elect new indicators.
⇒ This study focuses on practice-based quality measures that are captured in health administrative data, such as fee codes associated with physician services. Thereby, aspects of primary care provision that are not captured in administrative data will be excluded from our indicator set—although they may be clinically meaningful and important to providers and patients.
⇒ We will collect and analyse both quantitative data and open-ended responses from the questionnaires, which will offer explanations and clarification on the items.
⇒ This study will establish technical definitions for quality indicators that can be examined in future population-based analyses. We present an example of using health administrative data to understand quality of care within ICES data holdings in Ontario, Canada. Due to differences in how processes are specified and measured in other administrative data sources, these technical definitions will require adaptation before they can be applied to other settings.

INTRODUCTION

Primary healthcare is situated as the 'first point of contact' with the health system, helping patients navigate and coordinate their care journey.[1] Well-developed primary care has the potential to address the complex medical needs of older adults (aged 65+),[2 3] including frailty, multimorbidity, polypharmacy, functional decline and the need for integration across healthcare settings.[4–8] Older adults have high rates of primary care utilisation, which have intensified over the course of the COVID-19 pandemic.[9] In Canada, multidisciplinary providers collaborate in the shared delivery of primary healthcare, with the vast majority of patients receiving care from family physicians.[10] Family physicians provide the highest volume of medical services to older adults compared with other medical specialties, and almost one-third of all family medicine services are delivered to older patients.[11]

While graduating from an accredited Canadian family medicine residency programme would confer baseline competencies in caring for older adults, it would be expected that there is a wide range of competencies and confidence in providing the types of care needed by older patients.[12] This variation may influence care quality and could be associated with more positive or negative health outcomes.

All physicians who graduate from an accredited family medicine programme in Canada have achieved a baseline level of competence in caring for older adults; the College of Family Physicians of Canada (CFPC) recognises caring for 'elderly' patients as a priority.[13] Accordingly, this education and accreditation body has developed essential competencies aligned with the 'elderly' priority topic that family physicians must master to become certified to practice as a family physician in Canada.[13] 'Competencies' are regarded as abilities or capabilities and form the basis for medical education planning and training in many jurisdictions.[14] Individual postgraduate family medicine training programmes use CFPC priorities to establish educational curricula, define core professional activities and develop evaluation methods to assess competence.[15 16] Individual postgraduate programmes will also determine the nature of clinical experience to best achieve competence in priority topics by considering local needs and resources. Beyond this foundational training, some resident physicians may pursue enhanced skills training to become a community-based resource for older adults by completing a third year of residency training through the Certificate of Added Competency (CAC) programme.[17 18] This extra training is not necessary to provide high-quality care for older patients.

While there are benchmarks of achieving competence during medical training, the current educational model is unlikely to prepare family physicians to consistently provide high-quality care in the future for *all* older patients in *all* areas. Because medical knowledge, evidence and best practice guidelines evolve and patients grow increasingly complex, the goal of medical training is to provide the foundation on which additional competency building blocks are placed. The current state of primary care and recent calls for reform create an opportunity to examine the quality of care provision to this patient group.

Quality indicators in healthcare offer guidance and direction to understand the performance of structures, processes and outcomes, and allow for inferences about care quality.[19] Despite well-recognised barriers, quality improvement work concerning the primary care of older persons has not been widely pursued in Canada. One approach to measuring healthcare quality is utilising secondary (health administrative) data;[20 21] although examining indicators in practice are limited by the information sources available. Some appropriateness studies have established quality standards or priorities to improve care for older patients in different care settings,[22–27] but none have reported a measurable indicator set. Few quality indicator sets are based on readily collected data

or have been developed by referencing health administrative data holdings, thereby affecting their efficacy to assess performance.[21]

The primary objective of this study is to establish consensus on practice-based process metrics that characterise quality of care for older primary care patients and can be examined using secondary, administrative data. Once developed, these metrics will provide a preliminary framework to characterise practice-level and population-level encounters of family physicians delivering care to older patients, and offer insights into the outcomes of their care provision. This work is organised around the research question: within the framework of secondary, administrative data as a lens to understand primary care practice, can a technical expert panel establish consensus on which practice-based process metrics suggest better versus worse quality of care for older patients? The secondary objective will be to operationalise these indicators using population-based data in Ontario.

METHODS AND ANALYSIS
Study design
This study utilises a two-phase RAND/UCLA Appropriateness Method (RAM) study design to assess the consensus of a technical expert panel. Consensus group methods (eg, Delphi and its derivatives and Nominal Group Technique (NGT)) systematically measure and establish agreement across disciplines.[28] They are based on the premise that an accurate and reliable assessment can be achieved by consulting a panel of experts and accepting group consensus.[28 29] The Delphi technique has been widely applied in health research for quality indicator development.[30] In particular, RAM is a modified Delphi design and an iterative group facilitation technique that seeks the opinions of experts through a series of structured questionnaires and direct (synchronous) interactions.[31] We will apply the Conducting and REporting DElphi Studies (CREDES) checklist to report this study protocol (online supplemental file 1).[32]

Setting
We will derive indicators of primary care delivery pertaining to family physician care—irrespective of any additional training, certification or focused practice experience they may possess in the care of older adults. Technical definitions will be established to operationalise each indicator using ICES data holdings in Ontario, Canada. ICES is a population-based, health administrative data repository containing record-level, linkable data sets about publicly funded health service encounters.[33]

Quality indicators
The Donabedian model—the dominant quality improvement paradigm in health services research—conceptualises and enables evaluations of the quality and performance of medical care through three inter-related components: structures, processes and outcomes.[20 34 35] Structures are

static or technical factors affecting the context in which medical care is delivered (eg, human resources, payment models and healthcare institutions), processes refer to acts of healthcare delivery (eg, diagnoses, treatments, preventative care and patient education) and outcomes include the effects of medical care on patient health (eg, prognosis, patient satisfaction and health service utilisation). In this study, we focus on indicators that can be classified as processes, given their relevance to the practice-based clinical activities of physicians. Structures will not be examined due to their upstream and evolving nature, which is challenging to discern from individual-level data. Outcomes are influenced by multiple structures and processes, including care delivered by multidisciplinary providers in different settings, which is not specific to the care of family physicians.

Population-based health administrative data repositories enable health services researchers to examine components of medical care, which can support inferences about care quality. Therefore, establishing technical definitions to operationalise each endorsed quality indicator will enable future work to describe processes inherent to the care of older primary care patients. Our access to linkable health administrative data at ICES, a central data repository in Ontario, Canada, provides an example of using physician billing data to examine primary care processes.

Data collection
There are multiple components of this two-round RAM study.

Literature review
First, we will conduct a literature search to inform the questionnaire items,[36] which distinguishes this method from NGT.[29] This review of academic (peer-reviewed) and grey literature will clarify the state of indicator development for older adults' primary care, their methodological quality and identify current gaps in indicator availability.[31] The full search strategy is outlined in online supplemental file 2. From the included literature, we will extract the names and descriptions of quality indicators, metrics, or processes and generate a candidate list that our technical expert panel will formally evaluate.

We will organise the indicators by the 'Priority Topics and Key Features for the Assessment of Competence in Care of the Elderly' to propose indicators that express each competency.[37] While not exhaustive, these 18 priority topics represent critical areas to assess enhanced competence in the care of older adults. We selected this framework as it reflects the bounds of best practices, and includes the specialised/added competence of CAC holders, but does not exclude the generalist family physician.

Preparing for round 1
The research team will iteratively draft the quality statements for our questionnaire to ensure accurate wording—thereby reducing bias and response variance.[38 39]

A physician (AG) will aid in reviewing the quality statements to ensure they align with current practice guidelines and accurately describe clinical scenarios and activities. Quality statements are traditionally written as a set of 'if' and 'then' statements, where the 'if' statement describes persons to whom the quality indicator applies and the 'then' statement identifies the care process. For example, *if* an older primary care patient is prescribed a new chronic medication, *then* the family physician should document the response to therapy and continued need.[40]

The quality statements will undergo internal review by two health administrative data experts (APC and AJ) to streamline the number of questionnaire items. The administrative data experts will rate each quality statement on a three-point Likert scale regarding their feasibility to be measured within ICES data holdings. Any statement rated 'definitely feasible' or 'probably feasible' by at least one reviewer will be included in the questionnaire. Finally, a physician (AG) will conduct a final review of the indicators to advise whether any statements can be combined based on clinical presentation or diagnosis.

Round 1—questionnaire
In the first round, an asynchronous questionnaire will be developed and distributed to our technical expert panel to evaluate the appropriateness and importance of each quality statement. The goal is to refine and evaluate the set of candidate indicators identified in the literature review.[28] RAM advises participants to rate items as 'appropriate' if the expected benefits exceed the expected risks.[31] Here, the expected benefit is assumed to occur when a family physician competently performs or facilitates the stated process within a primary care setting. The expected risk is any harm for the patient associated with the process (eg, inappropriate prescribing and avoidable emergency department visit) that might have unintended consequences or exacerbate the clinical problem. Participants will be advised not to consider cost implications when making their rating.[31] 'Importance' refers to whether the indicator occurs with moderate or high frequency in the primary care setting, and whether it impacts outcomes that are significant to health status or quality of life. We modified the traditional RAM criteria by adding 'importance' to ensure our indicator list reflects processes that are clinically meaningful and patient oriented.

Panel documents (ie, study protocol, evaluative criteria definitions and instructions) will be emailed to participants, along with a link to access the online questionnaire via Research Electronic Data Capture (REDCap). We will collect ordinal ratings using a nine-point Likert scale, which aligns with RAM recommendations and allows for granular measurement.[31 41] Ratings will range from 1 (extremely inappropriate/not important) to 9 (extremely appropriate/important). We will encourage open-ended responses in the questionnaire to solicit insights and other feedback from panellists.[38 42] Panellists will complete the questionnaire within a 2 week period in Spring 2023.

Pilot testing will occur with a subset of the research team to ensure comprehension and reliability of the questionnaire items.[38] Indicators meeting the specified threshold will be considered for the second round after further refinement and wording clarification.

Given diverse approaches to define consensus in RAM studies,[31] we elected to measure the proportion of agreement for each indicator within a predefined range. We will retain indicators that achieved a rating between 7 and 9 on both criteria (appropriateness and importance) by at least 50% of panellists. Following the first round, ratings and free-text responses will be summarised, and individual and group feedback will be shared with the technical expert panel.[28]

Preparing for round 2

Between the first and second rounds, we will reference health administrative data holdings at ICES to develop technical definitions for each candidate indicator. We will identify the relevant data set(s) and variable(s) for each endorsed quality statement, and present them in the second round for clarification and discussion.

Round 2—synchronous virtual meeting and questionnaire

The purpose of the synchronous virtual meeting is to establish consensus on the endorsed indicators and their corresponding technical definitions. This group meeting is a defining feature of RAM compared with a traditional Delphi.[31] The moderators (RHC and APC) will review findings obtained from the first questionnaire and facilitate an in-depth discussion of the data sets, variables and measurement characteristics (eg, timings) proposed for each indicator's technical definition. During the group meeting, members of the technical expert panel will be able to elect new indicators for rating. If a panellist suggests a new indicator and more than 60% of the panel endorses it, we will proceed with rating the item in the second questionnaire. Indicators that cannot be operationalised will be eliminated.

After the meeting, a second questionnaire will be circulated to participants to evaluate the endorsed indicators within 2 weeks. Panellists will once again rate the 'appropriateness' and 'importance' of the quality statements and their corresponding technical definitions. As in the first questionnaire, we will collect ordinal ratings using a nine-point Likert scale. Endorsed indicators will move into our final set if more than 60% of panel members rate the indicator between 7 and 9. Conformity is expected in our second round as panellists' opinions may converge based on group feedback and discussion—warranting an increased cut-point. Following the meeting, the final results will be summarised and shared with panellists.

Data analysis

We will combine the judgements of panel members using statistical integration for ratings and content analysis of open-ended responses. For each item (indicator) in the questionnaire, we will report the median, IQR and percentage of agreement to discern consensus and quantify its degree.[43] Medians are considered well suited for ordinal data and to reflect convergence of opinion.[42] We will conduct a Wilcoxon matched-pairs signed-rank test to measure changes in consensus between rounds.[44] If response bias is suspected, we will perform a sensitivity analysis to compare results among subgroups of respondents. Conventional content analysis will be used to derive themes and concepts from free-text responses provided by panellists.[45] When providing individual feedback, we will share each panellist's response relative to the group and a summary of the open-ended responses.

Data management

Data collected by the investigators will be analysed after each round. McMaster University will act as the sole data custodian, with the lead investigator (RHC) ensuring appropriate privacy and security standards are upheld.

Sample and eligibility criteria

To ensure validity, our technical expert panel will comprise individuals with extensive knowledge about primary care provision for older patients, evidenced by practice experience, research excellence, organisational or policy leadership.[38] Multidisciplinary panellists, including clinicians, educators and researchers of different genders, ages, races, geographic locations and institutions, will be sought to reflect diverse perspectives in the care of this heterogeneous patient population.[31] Specific qualifications to demonstrate expertise include at least two relevant academic publications related to the primary care of older adults and/or at least 5 years of clinical experience or activity with older primary care patients. Based on our intent to operationalise the elected indicators using provincial health data at ICES, we are primarily interested in panellists based in Ontario but will seek some national leaders. Each panellist is considered equal in their expertise to others in the group; the weight of each response is equal.[36]

Recruitment

We will identify prospective panel members by reviewing publicly available information (eg, faculty profiles) and published work (eg, reports and peer-reviewed articles), and consulting our personal networks to generate a list of experts in the field. We will employ purposive/criterion sampling to identify those that meet our eligibility criteria and quota sampling to ensure diversity in the professional backgrounds and demographics of panellists. Prospective panel members will be approached by research team members or their delegates via a personal email that describes the study, with a request about their interest in participation.[31] The lead investigator (RHC) will follow-up with individuals who express interest to explain the study methodology, scope of their engagement, time commitment and how their responses will be applied in the study.[46]

We will recruit between 12 and 15 individuals for our technical expert panel, which aligns with the recommended sample size to not overload, demotivate or disengage participants.[47] Given limited guidance on the target sample size for RAM studies, we aimed to strike a balance between generating more data with a large, representative sample and the potential for continuous dissensus. Panel members will be expected to participate in the two consecutive rounds to ensure engagement in the decision-making process. To deter response bias, we will implement strategies to increase the response rate (eg, providing honorariums and sending reminder emails) and compare the characteristics of respondents and non-respondents to identify potential impacts on the data. Following the study period, personal emails will be sent to panellists thanking them for their contributions and providing honoraria aligned with the standard primary care physician reimbursement rate in Ontario multiplied by the estimated time to complete each questionnaire and the duration of the virtual synchronous meeting.[48]

Patient and public involvement

The current study relies on the expertise of panellists with in-depth knowledge of primary care for older adults. However, through a separate study supported by the Transdisciplinary Understanding and Training on Research-Primary Healthcare (TUTOR-PHC) Patient and Community Engagement Research Fellowship, we intend to engage older adults to understand factors impacting the quality of primary care provision. This complementary study aims to compare aspects of primary care practice that are important to patients with indicators derived from the RAM study. We chose to engage the public through a separate consultative approach to eliminate technical discussions about operationalising indicators using health administrative data. This approach maximises patient perspectives and feedback in an open-ended format, rather than limiting their viewpoints to the constraints of feasible secondary data. This independent activity will allow the public to rate indicators identified in our formal consensus process and provide perspectives on what was created.

Rigour/limitations

Given the nature of consulting human subjects to generate consensus, several sources of bias may impact our findings' validity and reliability.[49] We will mitigate selection bias and foster dependability by predefining our inclusion criteria to seek a representative sample of experts and not solely relying on personal networks for recruitment.[49 50] While there is a potential for low response rates among panel members in RAM studies, we will combat this limitation by restricting our design to two rounds and providing honorariums.[36] We will ensure the credibility of our findings through ongoing engagements of our technical expert panel to solicit feedback and iteratively develop our indicator set.[49] We will not restrict the set of candidate indicators for panellists to rate to those identified in our literature review, as this may bias the responses or limit the available options for indicator development; we will provide an opportunity to elect new indicators in the second round.[51] We will lessen bandwagon effect (groupthink) in our synchronous virtual meeting by still allowing panellists to rate indicator items anonymously after group discussion. By registering our study and publishing this protocol, we have produced an audit trail of key methodological decisions to support trustworthiness.[49] Finally, our focus on practice-based indicators related to physician activities excludes the valuable contributions of multidisciplinary providers engaged in the integrated care of older adults across settings.

ETHICS AND DISSEMINATION

Risks to participants

We did not identify any known or anticipated risks for panellists as a result of participating in this study. Voluntary, written consent will be sought from panellists before participation and at each study phase. Individuals will be able to withdraw from the study at any time for any reason, and will be able to have their data withdrawn.

Confidentiality

Ratings, insights and other feedback shared by panellists will be anonymised on collection. All data will be associated with a unique identification (ID) number assigned to each respondent. No participant-level data will be shared with anyone other than the individual who submitted these data; they will receive individual feedback to understand how their response compares to others. All other findings from this study will be presented in aggregate.

Ethics approval

This study was approved by the Hamilton Integrated Research Ethics Board (Project ID #15545).

Results dissemination

Our findings will be shared publicly in academic publications, conference presentations and a doctoral thesis. Communications will be sent to relevant stakeholders (eg, CFPC and ICES) with the study's results for distribution in reports, social media posts, and newsletters.

DISCUSSION

This study will produce a measurable set of quality indicators to support further research examining primary care provision for older adults using secondary, health administrative data. While health services research often uses billing data to characterise healthcare encounters, there is substantial diversity in how processes are defined in different healthcare contexts and reported in administrative data sources. In the absence of universal technical definitions, we selected a particular context (ie, ICES) to develop technical definitions. While the specific data set and variable names we will use to construct technical definitions may not directly apply to other research settings,

future work can leverage the endorsed indicator set from our first round and translate our definitions to other contexts.

Additionally, our focus on practice-based quality measures may exclude some aspects of primary care that are not captured in administrative data. For example, characteristics of primary care encounters such as time spent with individual patients or engagement with informal caregivers may be clinically meaningful and important to patients, but are not available in billing data. Similarly, some components of the 'Priority Topics and Key Features for the Assessment of Competence in Care of the Elderly' may be over-represented or under-represented in our final indicator set based on their availability within health administrative data. For example, we anticipate it will be highly feasible to operationalise indicators related to 'medical conditions' because diagnostic codes and billing data for physician services are readily available in administrative data. However, indicators related to 'goals of care' may not have objective measures to specify within data holdings. Therefore, the practice-based processes included in our final indicator set may only constitute some of the primary care activities delivered to older patients.

While our final indicator set will apply to all family physicians who deliver care to older patients, we are interested in examining differences among those with a Focused Practice Designation in 'Care of the Elderly', CAC holders and generalist family physicians. Understanding the medical practice characteristics of family physicians with different levels of competency or practice compositions may identify systematic challenges in caring for older adults and gaps in essential competencies that require greater education and support. In addition, our final indicator set may inform the development of quality improvement strategies addressing processes integral to the primary care of older adults, which may then influence outcomes. Ultimately, this work aims to inform practice and education models that promote high-quality care for older adults.

Progress to-date

The literature review and preparation for the first questionnaire occurred in January and February 2023. Identification and recruitment of panellists began in March 2023. We anticipate distributing the first questionnaire in April 2023.

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