

Canadian Family Physician Preferences on Updating the Classification System for Health Conditions and Related Issues

Préférences des médecins de famille canadiens sur la mise à jour du système de classification pour les problèmes de santé et questions connexes



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Abstract

Physician billing claims are used to inform health system planning and for other secondary purposes. In most provinces/territories, diagnoses are coded using a system adopted in 1979, the International Classification of Diseases version 9 (ICD-9). This study aimed to understand the perspectives of family physicians on updating ICD-9. Canadian family physicians completed an online patient vignette coding exercise and electronic survey to capture preferences on two newer coding systems (ICD-11; International Classification for Primary Care version 3 [ICPC-3]), compared with the current ICD-9 system. The focus of this paper is the survey data, which were analyzed descriptively. One hundred and sixty-one family physicians from six provinces participated. Over half of them (58%) stated that ICD-9 should be replaced, and 86% of them felt confident learning a new coding system. After the coding exercise, most participants reported that they were very or somewhat satisfied with both newer systems (77% for ICD-11; 73% for ICPC-3). Family physicians in our study support replacing the outdated ICD-9 system to better reflect their workload and patient complexity. This paper provides recommendations for provinces/territories considering modernizing physician billing requirements.

Résumé

Les demandes de paiement des médecins sont employées pour éclairer la planification du système de santé et à d'autres fins secondaires. Dans la plupart des provinces et des territoires, les diagnostics sont codés à l'aide d'un système adopté en 1979, la Classification internationale des maladies, version 9 (CIM-9). Cette étude vise à comprendre le point de vue des médecins de famille quant à la mise à jour de la CIM-9. Les médecins de famille canadiens ont effectué un exercice de codage en ligne dans le cadre de scénarios de cas cliniques ainsi qu'un sondage électronique pour connaître leurs préférences au sujet de deux nouveaux systèmes de codage (CIM-11 et Classification internationale des soins primaires version 3 [CISP-3]), par rapport au système actuel de la CIM-9. Cet article porte sur les données de l'enquête, qui ont été analysées de manière descriptive. Cent soixante-et-un médecins de famille de six provinces y ont participé. Plus de la moitié d'entre eux (58 %) ont déclaré que la CIM-9 devrait être remplacée, et 86 % d'entre eux se disent confiants dans l'apprentissage d'un nouveau système de codage. Après l'exercice de codage, la plupart des participants ont déclaré qu'ils étaient très ou quelque peu satisfaits des deux nouveaux systèmes (77 % pour la CIM-11, 73 % pour le CISP-3). Dans notre étude, les médecins de famille appuient le remplacement du système désuet de la CIM-9 pour mieux refléter leur charge de travail et la complexité des patients. L'article formule des recommandations à l'intention des provinces et territoires qui envisagent de moderniser les exigences en matière de facturation des médecins.

Introduction

High-quality healthcare data are critical for policy- and decision makers who make important decisions affecting patients, clinicians and the sustainability of our healthcare systems.

Most Canadian provinces and territories have access to rich population-based administrative health data within their jurisdiction (Moride and Metge 2010; Quan et al. 2012), which are used extensively for secondary purposes such as costing, workforce planning, disease surveillance, safety and quality monitoring and research (Lix et al. 2008, 2012; Orr et al. 2016; Quan et al. 2012). One crucial database, physician billing claims, comprises information related to clinician payments for outpatient clinical visits. This database contains patient demographics, visit dates, services provided and diagnoses coded using the International Classification of Diseases version 9 (ICD-9) (Cunningham et al. 2014). The first implementation of the ICD-9 system in Canada was in 1979. The Canadian Institute for Health Information (CIHI) led the process for updating facility-based (i.e., hospital) coding to ICD-10-CA in the early 2000s. The CIHI has begun work to prepare for the implementation of the newest version (ICD-11); however, ICD-9 (including its variations) is still the required standard for community-based billing claims in most provinces and territories, making Canada one of only a few countries still using this 46-year-old classification system.

Several suitable alternatives could replace ICD-9 for physician billing and information capture in primary care. ICD-11 was approved by the World Health Assembly for international use in 2022 and represents up-to-date clinical and scientific content (Harrison et al. 2021). Another system, International Classification of Primary Care, launched its third version (ICPC-3) in 2020. ICPC-3 is intended to capture the unique workflow and issues managed in primary care, and has the ability to map to ICD-11 (Napel et al. 2022). Both systems are arranged in a hierarchical pattern with alphanumeric codes in different chapters representing body systems and other health problems, and fully conform to contemporary clinical information system design specifications. We previously conducted a novel coding exercise to evaluate how family physicians use these newer systems by asking them to code a series of patient vignettes and report their feedback through a survey (Pathiraja et al. 2025).

There is an important and timely opportunity to consider adopting a newer system for billing claims, which will enhance the value derived from large-scale, routinely generated data in Canada by providing physicians with a more comprehensive, modern coding system to document patient visits. While modifications to outpatient/ambulatory billing requirements are determined in collaboration by provincial/territorial health ministries and medical associations, this process should be aligned with CIHI's implementation plan, with the modernization of health data occurring synchronously for both community and acute care settings. Understandably, this would be a complex and resource-intensive endeavour, requiring substantial consultation and co-operation between key organizations (e.g., government, medical associations, physicians, vendors and healthcare systems). To inform the decision-making process for governments and policy/decision makers, we surveyed Canadian family physicians about their preference for adopting a new coding system to replace ICD-9.

Methodology

This was a mixed-methods study using an online patient vignette coding exercise for physicians to test and compare ICD-9, ICD-11 and ICPC-3, followed by a post-coding survey. The findings from the survey are presented in this paper, and a detailed description of the coding exercise results will be published elsewhere (Pathiraja et al. 2025).

Sample

Physicians practising longitudinal family medicine in Canada at the time of recruitment were eligible to participate in this study. Family physicians were selected as the target sample for several reasons: primary care is the gateway to the healthcare system in Canada and it represents the majority of patient encounters across the lifespan (Stewart and Ryan 2015), including preventive care and the management of medical and social needs. Subsequently, family physicians tend to use the largest volume and broadest scope of diagnostic codes compared with their specialist colleagues (Cunningham et al. 2014), meaning they have experience and knowledge with a greater variety of ICD-9 codes. Finally, family physicians use ICD-9 codes for multiple purposes, including submitting their billing claims, clinical documentation within an electronic medical record (EMR) system and quality improvement projects.

Physicians were invited to participate through various methods, including e-mails and newsletters distributed through primary care practice-based research networks (PC-PBRNs) and departments of family medicine in universities in seven provinces and territories across Canada, which were chosen based on existing contacts within these jurisdictions. In addition, recruitment was augmented using study advertisements at a national conference and through snowball sampling.

Recruitment through PC-PBRNs and universities included an initial e-mail invitation sent to eligible physicians, followed by up to two reminder e-mails. Upon completing both the coding exercise and the survey, participants were provided with a \$200 gift card. Recruitment was conducted between April and August 2023.

Data collection

Two new classification systems (ICD-11 and ICPC-3) were evaluated using an online patient vignette coding exercise and a post-coding survey. Participants first indicated their consent to participate through the online tool, after which they were shown a short video introducing the newer systems (ICD-11 and ICPC-3) and given instructions on how to complete the coding exercises. Participants were asked to use ICD-9, ICD-11 and ICPC-3 to code five randomly assigned vignettes (chosen from a total of 30) representing “real-world” patient visits in primary care, where they selected as many codes as needed to describe the diagnoses and health conditions represented in the scenario and additionally chose one diagnosis code for billing purposes. These vignettes were developed over several workshops with family

physicians and classification experts on our team using their clinical expertise and experiences, as well as considering common diagnoses associated with patient visits in a pan-Canadian primary care EMR database (Garies et al. 2017). The online coding exercise platform was custom-built to integrate the coding tools from ICD-11 and ICPC-3 behind an interface that was identical for all classification systems. Following the coding exercise, participants were asked to respond to categorical and open-ended questions to assess their experience using the new coding systems and their perspectives on replacing ICD-9. Survey questions were based on guidelines for feasibility studies (Bowen et al. 2009; Pearson et al. 2020): acceptability, feasibility, satisfaction, compatibility (with primary care practice), complexity (difficulty of use), self-efficacy (confidence in the ability to adopt a new system) and context (implementation concerns and system preferences). Finally, demographic questions were asked about participants' age, gender, number of years practising family medicine, clinical full-time equivalent and characteristics of their main clinical practice (province, urban/rural, academic/non-academic practice setting, whether they are part of a team-based practice, panel size and use of an EMR).

Analysis

We used descriptive statistics to summarize participant demographics and compared these with the Canadian population of family physicians using data from the 2022–23 CIHI Physician Supply, Distribution and Migration Report (CIHI 2023). Responses to categorical questions in the survey were summarized using proportions, with corresponding 95% confidence intervals for multinomial proportions approximated using the Sison and Glaz method (Sison and Glaz 1995). A conventional inductive content analysis (Hsieh and Shannon 2005) was used to analyze responses from the open-ended survey questions. Three members of the study team (Dewdunee Himasara Pathiraja, Michelle Smekal and Aimie Lee) independently coded participant responses and merged codes into common themes. Codes and themes were reviewed iteratively to refine the categories and resolve discrepancies. The main themes were reported descriptively by the proportion of respondents. RStudio version 2023.06.1+524 was used for the quantitative analysis, and NVivo version 12 was used for the content analysis.

This study received approval from the lead site, the Conjoint Health Research Ethics Board at the University of Calgary (REB22-0590), and other provincial institutions that supported recruitment for the study. All study data were collected and stored on secure servers in the Cumming School of Medicine at the University of Calgary. Only authorized study personnel were permitted to access these data.

Results

In total, 161 family physicians from six provinces completed the coding exercise and post-coding survey (Table 1, available online at longwoods.com/content/27663). Overall, participants had a mean age of 41 years and a median of 7 years in practice, with most participants from three provinces (Ontario, Alberta and Saskatchewan). More than half of the

participants were women (55.9%), most of the participants practised in an urban setting (71.4%) and the majority were part of team-based practices (77.6%). Compared with all family physicians practising in Canada, our study participants were under-represented by men, mid- to late-career physicians, and saw varied representation by province (Table 1, available online at longwoods.com/content/27663).

In the post-coding survey, participants were asked if they thought ICD-9 should be replaced; over half of the respondents (58.4%) indicated “yes” to this categorical question, and an additional 35.4% selected “maybe,” depending on what the new system would be (Table 2, available online at longwoods.com/content/27663). Self-efficacy was high, with 86.4% reporting that they would be very or somewhat confident in learning a new coding system, and most of the participants indicated that they would be confident in learning either of the two new systems, ICD-11 (69.6%) and ICPC-3 (61.5%), if adopted.

After testing ICD-11 and ICPC-3 in the vignette coding exercise, including selecting codes for billing and clinical documentation in their EMR, participants had a slightly higher preference for ICD-11 when used for documentation (32.3%, 95% confidence interval [CI: 24.2, 40.4]) but this was not significantly different to the proportion of participants with a preference for ICPC-3 (26.1%, 95% CI: [18.0, 34.2]) (Table 2, available online at longwoods.com/content/27663). Another 29.2% (95% CI:[21.1, 37.3]) stated either system would be acceptable (Table 2, available online at longwoods.com/content/27663). When indicating their preferred system for billing purposes, a similar proportion of respondents was found to have a preference for ICD-11 (26.1%; 95% CI: [18.0, 34.3]) and ICPC-3 (25.5%; 95% CI: [17.4, 33.6]), with no significant differences between the two systems (Table 2, available online at longwoods.com/content/27663).

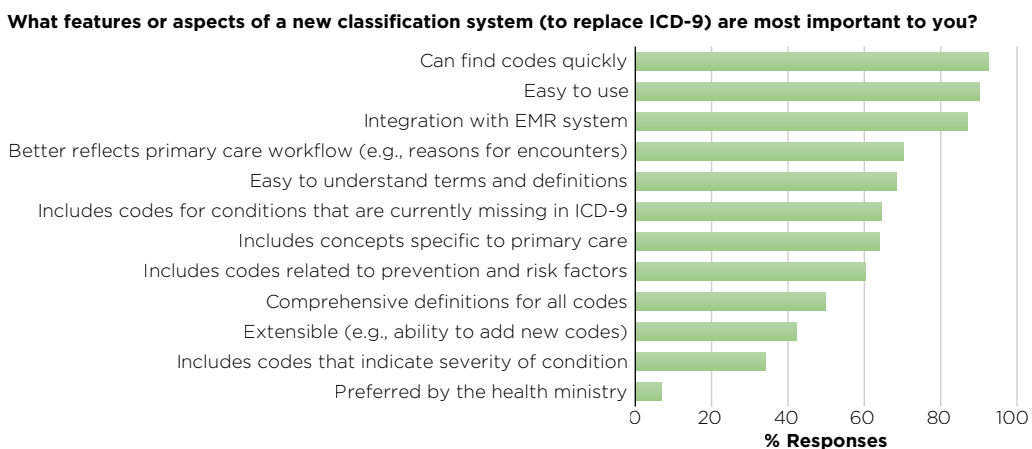
Overall, satisfaction was high for both newer systems: 77.1% of the participants were very or somewhat satisfied with ICD-11, and 73.3% felt the same about ICPC-3. Respondents were able to provide additional feedback on these systems using an open comment box. For ICD-11, over half of the respondents (62.1%) indicated that it had better codes than the existing ICD-9 system (including responses related to more codes, improved code descriptions and better accuracy); for example, “[ICD-11 is] better at describing unspecified symptoms than ICD-9” (P74) and it had “detailed descriptions and variations of common presentations that captured both medical and social/psychiatric complexities” (P1559). However, others (18.0%) noted limitations when using ICD-11 for coding activities related to prevention and social factors, with one respondent commenting that “the inability to accurately document social issues impacting patients was challenging” (P843).

On the ICPC-3 system, respondents noted several attributes they appreciated, including being easy to use (45.3%), its relevance to primary care (42.9%) and its ability to code undifferentiated and non-specific health conditions or symptoms, with one-third (34.2%) stating that ICPC-3 was better than the ICD classification systems. One respondent noted that ICPC-3 was “by far the least complicated ...easy to find what you want” (P732), with another stating, “codes are broad enough to be widely applicable for complaints and visits

that don't have a specific medical diagnosis yet. I really liked being able to code a symptom or complaint like 'low back pain'" (P181). Conversely, some of the respondents (24.8%) felt that ICPC-3 was not specific enough; one participant mentioned that "by the nature of being more generic, all-encompassing, and overall easier to use, it [ICPC-3] loses some of its ability to be more specific" (P732). Respondents also noted their unfamiliarity with ICPC-3, as it is not commonly used in Canada; a higher proportion of respondents indicated some difficulty adjusting to ICPC-3 (36.0%) compared with ICD-11 (23.6%).

Participants were asked to select from a list of general features or attributes they felt would be necessary to have in a new classification system to replace ICD-9 (not specific to ICD-11 or ICPC-3). The top responses were the ability to find diagnostic codes quickly (92.5%), easy to use (90.1%) and the ability to integrate into their EMR system (87.0%) (Figure 1). Other, more modestly desired, attributes included having codes to better reflect primary care workflows (selected by 70.2% of the participants), easy-to-understand terms and definitions (68.3%), inclusion of codes/diagnoses that are currently missing from ICD-9 (64.6%), concepts that are specific to primary care (64.0%) and having codes related to prevention and risk factors (60.2%). From the open-ended question asking participants to describe any additional desired features, a few suggested improved codes (8.7%), the ability to integrate into or be consistent with other systems (5.0%) and being provided with a clear benefit for changing systems (2.5%). For example, "codes that describe symptoms are important, as diagnoses don't always come on the very first visit patients present with" (P938).

FIGURE 1. Features of a new classification system to replace ICD-9 that were important to respondents.



EMR = electronic medical record; ICD-9 = International Classification of Diseases version 9.

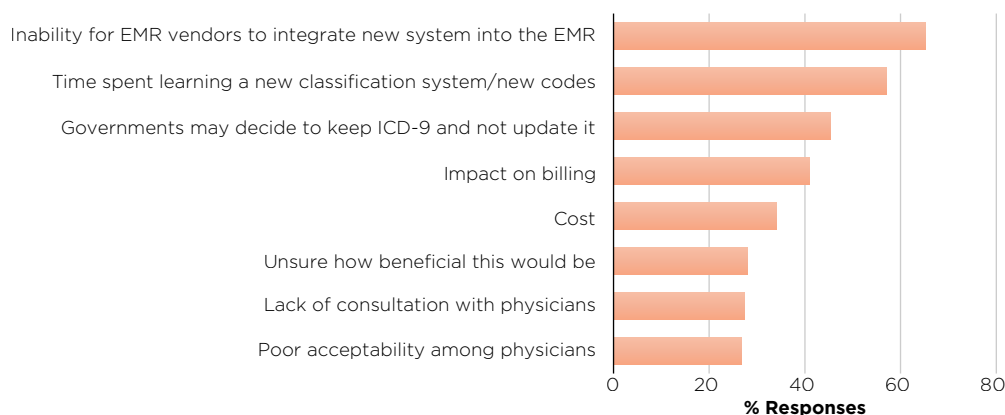
Over half of the respondents expressed concern with the potential time it would take to learn a new classification system (57.1%), and whether EMR vendors would be able to integrate the new coding system into the EMR (65.2%) (Figure 2). Other significant concerns, but less frequently cited, included whether governments would decide to keep ICD-9 (45.3%), impact on physician billing (41.0%), cost (34.2%), unsure about the benefits of replacing

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ICD-9 (28.0%), potentially lacking appropriate physician consultation (27.3%) and poor acceptability among physicians (26.7%) (Figure 2).

FIGURE 2. Top concerns about implementing a new classification system to replace ICD-9, as selected by respondents.

Do you have any specific concerns about implementing a new classification system?



EMR = electronic medical record; ICD-9 = International Classification of Diseases version 9.

As a final point, one participant provided this succinct description of the issues of ICD-9 and the anticipated benefits of adopting a newer system:

I am appalled that we are using a coding system that was developed almost 50 years ago, more than 20 years before I was born! A modern coding system would allow physicians to provide better care for our patients, especially those who have historically been marginalized. A more inclusive system would allow us to track social determinants of health, which would have the potential to influence health policy and spending. (P746)

Discussion

The contemporary purpose of the ICD system is to produce standardized health data for national and international comparisons and reporting (Chute and Çelik 2021). As CIHI prepares for the eventual implementation of ICD-11 in hospitals, we risk falling further behind in our data capture for community and primary care settings. This will present major challenges when using physician billing claims alongside hospital datasets. More importantly, ICD-9 was not originally designed for clinical record-keeping and is known to be inadequate in representing primary care today, especially in its outdated language and terminology, weaknesses in capturing non-specific symptoms, poorly documenting uncertainty around suspected diagnoses and inability to code for diagnoses that have arisen since the 1970s (Bhise et al. 2018; Garies et al. 2022; Katz et al. 2012; Ryan et al. 2019). As a result, the

interpretation of ICD-9 diagnostic codes can be problematic, especially when used by policy makers to understand the complex work of family physicians or by researchers reporting on the prevalence of conditions in the community.

The perspectives of family physicians are valuable to inform a potential future replacement of ICD-9. We found that 58% of the study respondents agree that ICD-9 should be replaced, with an additional 35% open to the idea, depending on the new system. Most of them stated that they would feel confident working with a new coding system for billing submissions and clinical documentation in their EMRs. Several key study findings from family physician participants should be used to guide governments and decision makers in their approach to adopting a replacement for ICD-9:

- Demonstrate the value proposition to physicians.
- Co-design the implementation process with physicians and relevant organizations (e.g., medical associations) and individuals (e.g., billing clerks).
- Mandate EMR/electronic health record vendor integration of the new coding system, including the absorption of associated costs by the vendor to ensure that these are not passed on to physicians.
- Ensure that the new system includes a comprehensive suite of codes with easy-to-understand definitions/terminologies that are relevant to primary care (i.e., social determinants, prevention, reasons for encounter, risk factors and severity). These need to be easily searchable and include both medical and lay terms, as well as synonyms.
- Ensure that there is no impact on billing payments to physicians, other than creating an improved, more efficient submission process.
- Develop comprehensive training materials for physicians and billing clerks.

Both ICD-11 and ICPC-3 would be good candidates to replace ICD-9 for physician billing and information capture in primary care and offer many features desired by the study participants. If a dual-coding system were in place (i.e., ICD-11 in acute care and ICPC-3 in primary care), there are maps that could support information exchange between the two. Both systems were explicitly created for digital environments (Harrison et al. 2021; Napel et al. 2022) in their design for implementation within modern information technology infrastructures, flexibility for future modification, multiple language capabilities and availability of free open application programming interfaces that would allow EMR vendors to easily install the codesets for either ICD-11 (WHO 2021) or ICPC-3 (WONCA 2024). These systems also have built-in smart search functions, allowing clinicians to easily and quickly find codes that are most relevant to them; this was also cited as a vital attribute by almost all participants in this study.

Canadian provinces and territories now have an ideal opportunity to leverage the work and momentum created by CIHI, as well as to learn from the 132 World Health Organization (WHO)-member states who are in various phases of adopting ICD-11 (WHO 2024),

including access to a detailed, WHO-developed implementation/transition guide (WHO 2019). We encourage health ministries to start exploring the process for updating our archaic diagnosis coding system for billing. The findings from this study indicate that family physicians will be supportive, provided that their concerns are addressed and that there is meaningful communication, collaboration and appropriate change management strategies in place.

Future directions

Our study team recently completed additional work on this topic, including in-depth focus groups with Canadian family physicians and interviews with policy- and decision makers from key organizations, such as government, medical associations and EMR vendors. Further research is required to solicit feedback from groups not captured here (i.e., other specialist physicians and practitioners, billing clerks and healthcare delivery organizations). Due to the complex nature of a proposed update to the ICD-9 system, it is anticipated that other types of evidence will be required to inform a future transition – for instance, a cost-benefit analysis, testing technology integration with EMR vendors, conducting pilot studies with clinical practices to test the “real-world” use of a new coding system and summarizing learnings from the ICD-11 implementation planning and experiences in other countries, such as Kuwait (Ibrahim et al. 2022), China (Zhang et al. 2024), Rwanda (Mugisha et al. 2020), France and the US (Boussat et al. 2025), among others. Finally, a new classification system built for modern clinical and technological environments could enhance data interoperability and advance computer-assisted coding using artificial intelligence (WHO 2025). This could substantially reduce administrative burden for clinicians and improve the accuracy of code selections.

Limitations

While this survey captured responses from 161 family physicians across the country, we attempted to recruit participants from all provinces and territories but were unsuccessful, which limits generalizability. Second, the use of ICD-9 for outpatient billing extends to specialties other than family medicine, and those perspectives are not captured here. However, family physicians are the largest group of ICD-9 “users”; they tend to manage their own billings and use an extensive range of ICD-9 codes, making them expert end-users for this study. Further work is needed to seek perspectives from physicians in other specialties. Finally, this survey may not have captured the full breadth of feedback on replacing ICD-9 and implementation concerns or facilitators, and there may be unanticipated challenges that arise in the future if the adoption of a new classification system was to commence.

Conclusions

It is time to seriously consider updating the ICD-9 system used across Canada. Provincial

and territorial governments, alongside medical associations, play essential roles in the decision to modify physician billing requirements. Family physician participants in this study supported replacing ICD-9 to better represent their workload and the complexity of patients they care for, provided their concerns about the transition are meaningfully addressed.

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