


## Letter to the Editor

# Letter to the editor: enhancing healthcare-associated infection reporting in Canada

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### To the Editor,

Healthcare-associated infections (HAI) are the most frequently reported adverse event in healthcare worldwide.<sup>1</sup> In Ontario and Quebec, Canada, *C. difficile* (CDI) and methicillin-resistant *S. aureus* (MRSA) HAI surveillance are mandatory for acute care hospitals.<sup>2,3</sup> Traditional active surveillance by infection prevention and control (IPC) teams is considered the “gold-standard” but is time-consuming and labor-intensive.<sup>3</sup> However, passive surveillance using administrative data would be a cost-effective alternative as it relies on routinely collected and consistently defined data.<sup>4</sup> The Canadian Institute for Health Information (CIHI) implemented HAI surveillance through its Discharge Abstract Database (DAD), an administrative database that contains a codified summary of a patient's stay in hospital, which is coded by the hospital clinical coding team (CCT) using the International Classification of Diseases 10th Revision (ICD-10) codes, in accordance with CIHI standards.<sup>5</sup> However, it has been demonstrated that its accuracy in Canada is limited in comparison with active surveillance data.<sup>6</sup>

Since 2016, the CCT at St. Joseph's Healthcare Hamilton (SJHH), Ontario, has used IPC data to report CDI and MRSA infections to CIHI. To do so, IPC sent a monthly HAI list to the CCT, ensuring alignment and provided training on the differences and definitions used for these infections. This practice deviates from CIHI standards, which mandate that coders only use chart documentation from physicians, midwives, or nurse practitioners. In 2017, SJHH transitioned to an electronic medical record (EMR), allowing IPC team to document infections directly, eliminating the need for monthly lists. A report was developed to support monthly and year-end reconciliation, enhancing data accuracy. The collaborative approach was readily adopted, resolving data discrepancies.

As a quality assessment project approved by the Director of professional Services, we conducted a study to assess the validity of

CCT data compared to the IPC data for the CDI and MRSA HAI surveillance at SJHH and at the Centre hospitalier universitaire Sainte-Justine (CHUSJ), Quebec, Canada.

CCT in each location provided the number of charts (HAI and total) for which a diagnosis of CDI or MRSA was reported between 2018 and 2020, whereas IPC teams provided the number of positive HAI CDI and MRSA cases for each year. Then, each location provided the number of concordant cases between CCT and IPC teams. CDI and MRSA definitions used by CCT and IPC team can be found in the supplementary material. The accuracy of CCT data was validated against the reference standard (IPC data).

During the study period, the SJHH CCT identified a total of 346 charts with a diagnosis of CDI (125 HAI) and 100 for MRSA (12 HAI), whereas IPC identified 135 and 25 charts for CDI and MRSA HAI, respectively. The number of concordant cases (true positives) was 120 for CDI and 12 for MRSA. We also had 15 false negatives (FN) for CDI and 13 for MRSA, and five false positives (FP) for CDI and 0 for MRSA. Compared to IPC data, the CCT data had a high sensitivity and specificity for CDI, but a low sensitivity for MRSA (Table 1).

At the CHUSJ, the CCT identified a total of 74 charts for CDI (15 HAI) and 95 charts for MRSA (1 HAI), whereas IPC identified 59 charts for CDI HAI and 9 charts for MRSA HAI. The number of concordant cases was 9 for CDI and 0 for MRSA, with 50 FN for CDI and 9 FN for MRSA; 6 FP for CDI and 1 FP for MRSA, indicating very poor sensitivity for both infections (Table 1).

SJHH uses IPC data to report accurate numbers to CIHI. However, this exercise was conducted to assess whether CCT data alone would provide the same level of accuracy compared to IPC data. The SJHH CCT demonstrated high accuracy in coding CDI, likely due to the training provided by the IPC team in identifying HAIs. However, studies have shown that administrative data accuracy is generally moderate for identifying CDI cases.<sup>7</sup> In contrast, more challenges were faced in identifying MRSA HAIs. To note, there is only one ICD code to identify CDI, whereas multiple codes exist for MRSA, making it more difficult to pinpoint.

A very poor sensitivity was found at CHUSJ. However, it is important to note that data from Quebec is not part of the CIHI

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**Table 1.** Sensitivity, specificity, positive and negative predictive value of CDI and MRSA HAI cases detected by the clinical coding team in each location

		Sensitivity	Specificity	PPV	NPV
St-Joseph Hamilton Healthcare	CDI	89% (95% CI: 82%–94%)	98% (95% CI: 95%–99%)	96% (95% CI: 91%–99%)	93% (95% CI: 89%–96%)
	MRSA	48% (95% CI: 28%–69%)	100% (95% CI: 95%–100%)	100% (95% CI: 74%–100%)	85% (95% CI: 76%–92%)
Sainte-Justine University Hospital	CDI	15% (95% CI: 7%–27%)	60% (95% CI: 32%–84%)	60% (95% CI: 32%–84%)	15% (95% CI: 7%–27%)
	MRSA	0% (95% CI: 0%–34%)	100% (95% CI: 94%–100%)	0% (95% CI: 0%–97%)	90% (95% CI: 83%–96%)

CDI, *C. difficile*; HAI, Healthcare-associated infection; MRSA, methicillin-resistant *S. aureus*; PPV, positive predictive value; NPV, negative predictive value.

DAD, as it is submitted to CIHI directly by the ministère de la Santé et des Services sociaux du Québec.<sup>5</sup> The standards in Quebec are not similar to those in the rest of Canada.<sup>8</sup> At CHUSJ, physicians must specifically indicate in the patient's chart that an infection is healthcare-associated for the CCT to code it as an HAI. In contrast, Ontario assigns a diagnosis type to every code, allowing for differentiation between conditions present before or after admission.<sup>9</sup>

In Ontario, SJHH successfully implemented the procedure, with IPC and CCT collaborating closely. This study points to benefits of hospitals comparing their CCT data with the IPC surveillance program and building collaborative partnerships to improve data accuracy. CIHI data plays a vital role in healthcare decision-making, enabling hospitals, policymakers, researchers, and public health organizations to monitor performance, improve care quality, and guide health policies across Canada, making accurate data essential.<sup>10</sup> The study also suggests the potential value of expanding CIHI coding stand to integrate IPC data to enhance HAI identification, which can be challenging to detect through physician's documentation alone, providing a more accurate HAI picture.

**Supplementary material.** The supplementary material for this article can be found at <https://doi.org/10.1017/ice.2024.201>.

**Author contributions.** Virginie Boulanger – Conceptualization, methodology, investigation, validation, formal analysis, writing.

Sonia Shields – validation, writing – review.

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Anne MacLaurin – Conceptualization, resources, writing – review and editing, funding acquisition.

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**Competing interests.** None.

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