

QUALITY IN OUR SURVEILLANCE SYSTEM: COMPREHENSIVE VALIDATION OF OUR *CLOSTRIDIoidES DIFFICILE* INFECTION SURVEILLANCE DATA

Aleksandra Gara¹; Elisa Lloyd-Smith¹; Allyson Hankins²; Robyn Hunter²; Kelsi Rivers²

1. Quality, Patient Safety and Infection Control, Vancouver Coastal Health 2. Infection Prevention and Control, Vancouver Coastal Health

BACKGROUND

- High quality and reliable surveillance data are important for setting healthcare priorities, measuring progress in quality improvement and understanding healthcare associated infection (HAI) burden in our hospitals.
- In the past three years, given the pandemic related strains on infection prevention and control, there were changes to case review for inclusion in our surveillance system which covers seven hospital sites ranging in size: >500 beds (n=1), 300-150 beds (n=3), <60 beds (n=3).
- We set out to evaluate the impact of this change by reviewing whether case definitions were applied accurately and consistently.

PROJECT

- A blinded retrospective case review was introduced to validate the surveillance case definition of healthcare associated *Clostridioides difficile* infection (CDI).
- Infection, prevention and control practitioners (ICPs) who did not carry out the initial case review were assigned cases that were randomly sampled from our surveillance system from January 1, 2020 to August 31, 2022 as described in Figure 1.
- ICPs were blinded to original inclusion details of the cases however, they were aware that the cases had been included in the surveillance database as HAI cases historically.
- Cases were reviewed against the Vancouver Coastal Health CDI case definition which aligns with our provincial and national definition for healthcare associated CDI.
- A senior ICP was selected to provide review for uncertain and discrepant cases.

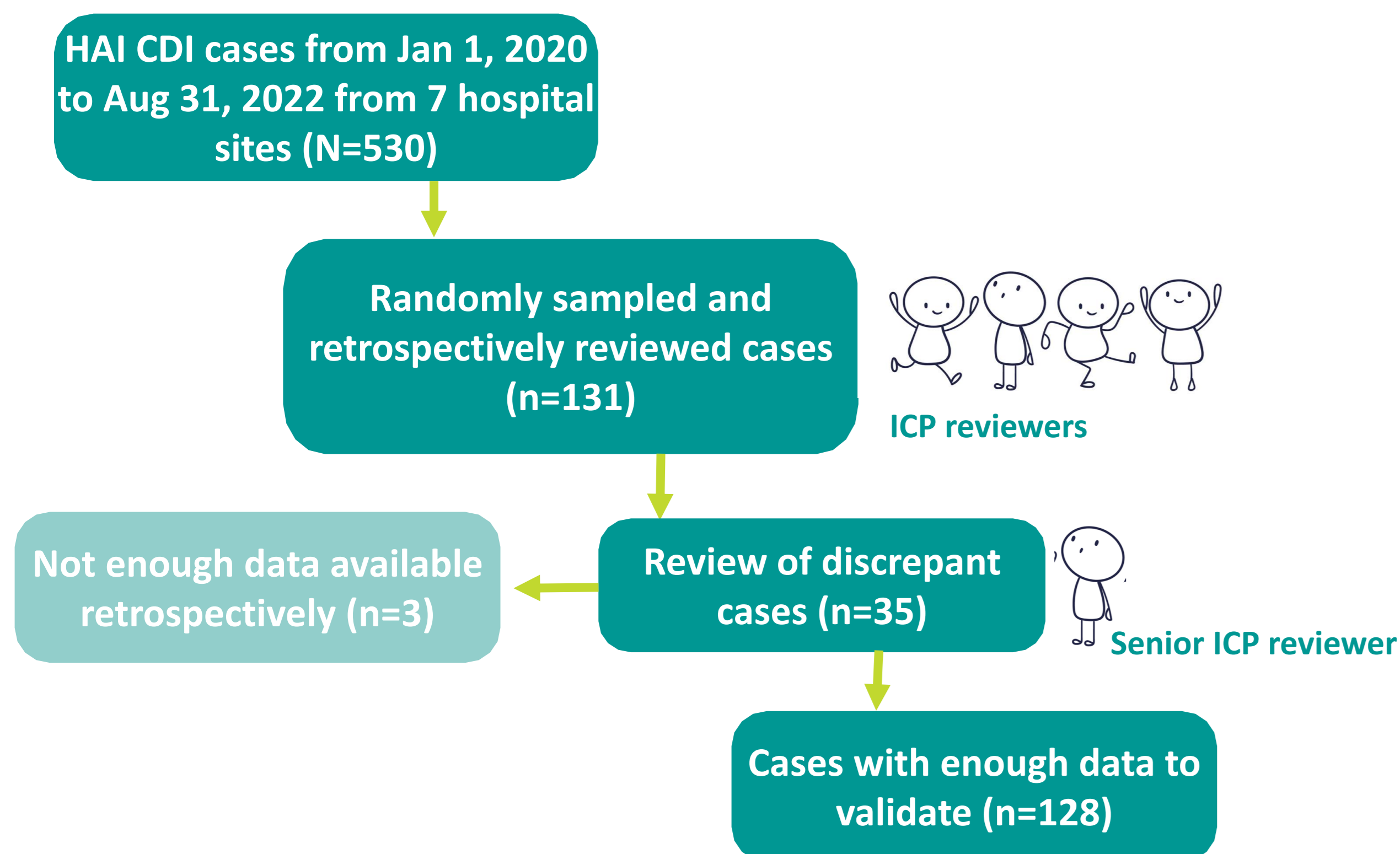


Figure 1. Case selection for validation

RESULTS

- 131 CDI cases were retrospectively reviewed and ICP reviewers agreed on 73% (96/131) of the cases with the original case determination, suggesting substantial agreement.
- The ICP review found the following areas of disagreement:
 - In 5% there was disagreement on whether the case was part of the population under surveillance.
 - In 17% there was discord on meeting case definition for acute onset of diarrhea.
 - In 21% there was disagreement or uncertainty on healthcare attribution of the case.
- The senior ICP review of 35 cases with one or more discrepancy (15 cases (12%) with more than one) resulted in the final updated results:
 - 5% of cases did not meet case definition, the ICP reviewers and senior ICP reviewer agreed on these 7 cases.
 - 2% of cases did not have enough documentation available in electronic records to complete validation retrospectively.
 - Overall agreement of 95% (121/128) between validators and original case determination among cases that could be validated.

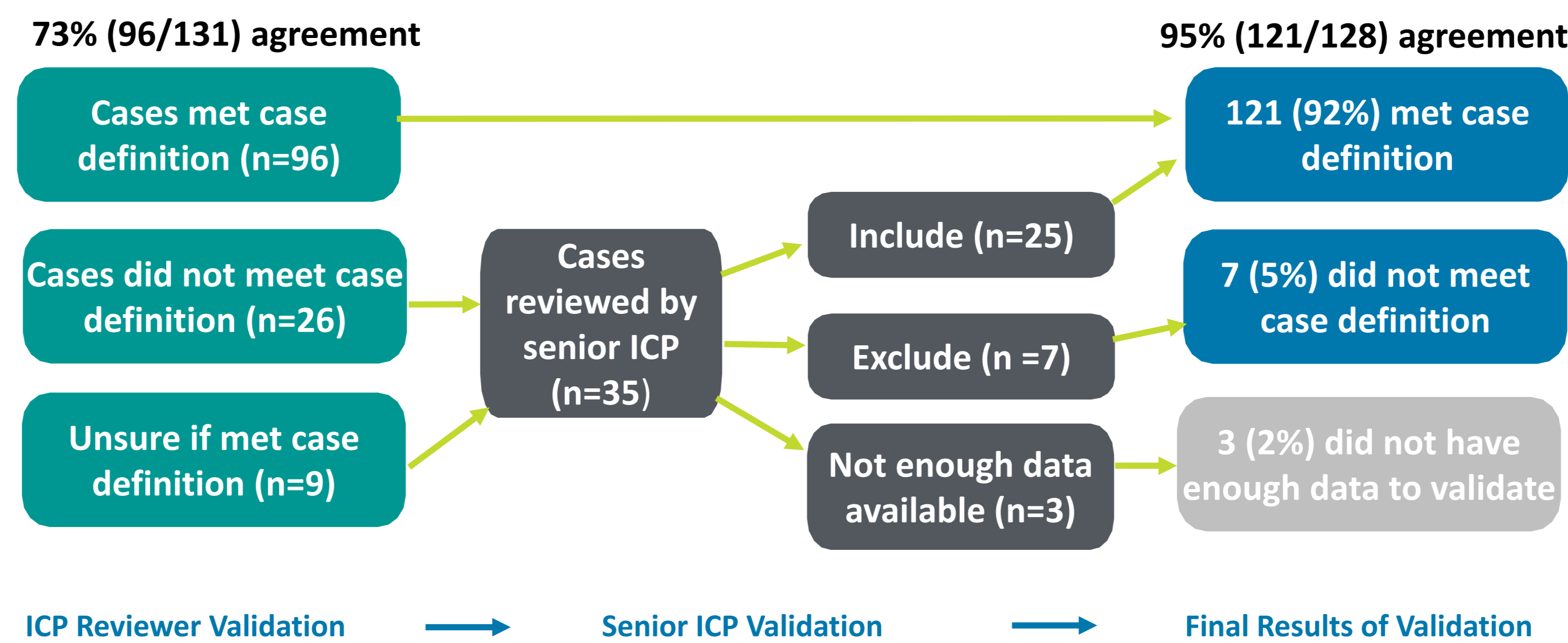


Figure 2. Validation process flow with outcomes

- Among the 7 cases determined not to meet case definition after two rounds of validation the following are reasons for exclusion:
 - 1% (1 case) was not part of the population of interest for surveillance in our health authority
 - 2% (3 cases) did not meet case definition for acute onset of diarrhea
 - 3% (4 cases) were not healthcare associated to our health authority
 - There was 1 case (1/7) that had two reasons for exclusion; they did not meet case definition for acute onset of diarrhea and were not healthcare associated

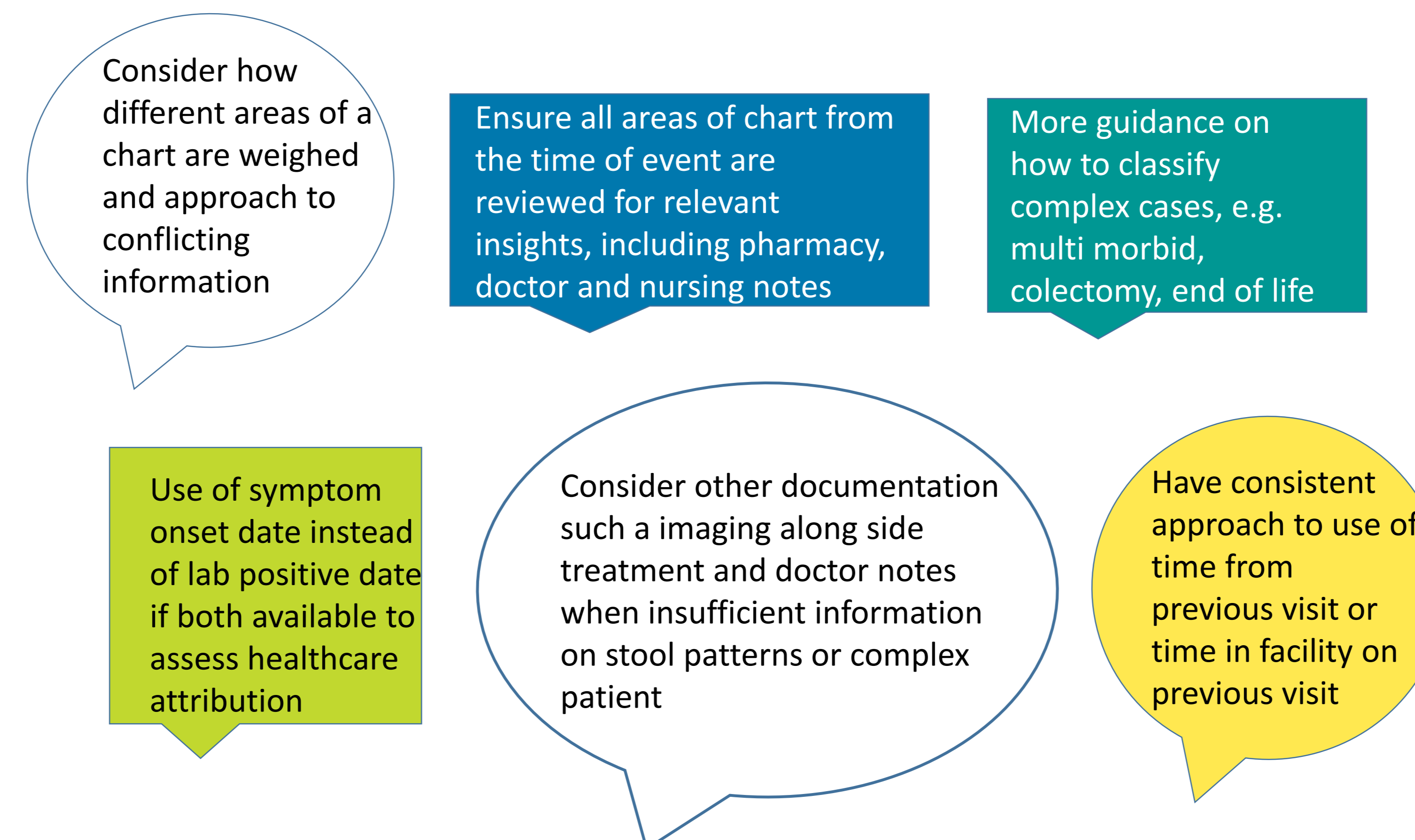


Figure 3. Opportunities for standardization in review process

DISCUSSION

- The blinded review of our recent CDI surveillance data proved to be a valuable step in our validation process, helping us understand discrepancy in case definition application.
- Although the agreement between reported and retrospectively reviewed cases by ICP reviewers was satisfactory, it highlighted the value of having a final case adjudication done by a senior ICP of the discrepant cases.
- The two rounds of review identified opportunities for us to provide more standardization in our approach to case review so that there is more alignment between reviewers in regards to which information they review, how they deal with conflicting information and how they handle absence of information.
- Other studies validating application of surveillance case definitions noted a range of agreement depending on type of surveillance being validated:
 - One study found 67% inter-observer agreement between reviewers and a concerning 16% false negatives among the central line associated bloodstream infection cases reviewed (McBryde et al), and
 - Another study found very strong agreement (96%) when assessing surgical site infections with few false negatives (3%) (Friedman et al).

LIMITATIONS/ LESSONS LEARNED

- We did not have access to all CDI lab positive results (HAI and not HAI), therefore we could not assess:
 - False negatives,
 - Positive or negative predictive values,
 - Sensitivity and specificity, and
 - Calculate a kappa value for the strength of our inter-observer reliability.
- Having the above metrics would allow us to also extrapolate our findings to the full set of cases and give us a better understanding of intra and inter generalizability of the CDI surveillance population.
- With more of our hospital sites moving to a full electronic medical record system we will have access to more lab data in future assessments and will be better equipped to assess if we are capturing a valid population. This shift will also remove any limitations of access to the full chart as charts will be fully available electronically.
- From this validation we have identified opportunities for:
 - More real time validation of our captured surveillance data,
 - More consistent documentation of signs and symptoms by clinical teams,
 - Further education and sharing of learnings about standardization with ICPs reviewing cases, and
 - Sharing of expertise among ICPs.

REFERENCES

- Friedman et al., Validation of Coronary Artery Bypass Graft Surgical Site Infection Surveillance Data From a Statewide Surveillance System in Australia. Infection control and hospital epidemiology, July 2007, vol. 28, no. 7
- McBryde et al., Validation of Statewide Surveillance System Data on Central Line-Associated Bloodstream Infection in Intensive Care Units in Australia. Infection control and hospital epidemiology, Nov 2009, vol. 30, no. 11
- Freepik, Free vector hand drawn stickman collection, accessed May 15 2023 at following location: https://www.freepik.com/free-vector/hand-drawn-stickman-collection_20832069.htm#query=stick%20figures&position=10&from_view=search&track=ais

ACKNOWLEDGMENTS

We want to acknowledge the hard work of our amazing infection control practitioners without whom this work and all improvement work for CDI would not be possible.