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Sepsis coding

INVITERT KOMMENTAR

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Sepsis presents a dual challenge: not only is it a severe condition that often poses treatment challenges, but accurately coding the diagnosis can also prove complex in a busy clinical setting. However, there are many reasons why codes should be applied correctly.

Patient registries are important for medical research and quality assurance, for economists, and particularly for public decision-makers at various levels. In Norway, there is a widespread perception that we are in a more advantageous position than larger nations with more complicated processes, and this is certainly true in terms of the provision of complete data in the registries. However, it is difficult to know the quality of a registry without examining the input. Skei et al. do precisely this in their assessment of sepsis coding practices at Norwegian hospitals over a 14-year period from 2008 to 2021 (1).

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There is an international consensus for the coding of two sepsis groups (2). In broad terms, these are sepsis with or without a known focus (organ focus), each involving a set of ICD-10 codes (3). In improper coding practices, patients with sepsis are coded both with and without an organ focus. Using data from the

Norwegian Patient Registry, Skei et al. demonstrate that the proportion with this dual coding was reduced from 14.3 % in 2008 to 4.1 % in 2021, most notably in the period after 2011. The increased emphasis on sepsis through national and international campaigns following the new international consensus on the definition of sepsis in 2016 (3), and a government review of sepsis coding in emergency departments in Norwegian hospitals in 2016–18 (4), may have contributed to the decline in the latter part of the study period. The proportion of sepsis episodes coded with a known focus saw a dramatic rise from 47.5 % to 82.3 %, in parallel with a corresponding decrease in the group with an unknown focus. It is well documented that early identification of an organ focus as the cause of infection improves patient outcomes, and in severe sepsis, this can be critical for providing appropriate and life-saving treatment (5). Overall, the authors conclude that sepsis coding practices in Norway improved during the study period.

The proportion of sepsis codes with a confirmed source of infection varied considerably among the health regions, and the greatest difference was observed between the Western Norway Regional Health Authority and Central Norway Regional Health Authority. This disparity may have implications for patient care, both medically and indirectly, through differentiated resource allocation as a result of activity-based funding based on the diagnosis-related group (DRG) system. Unfortunately, the data in the study do not provide for closer analysis of the underlying causes or the specific consequences of the regional differences in coding practices.

A weakness of the study is that data were only analysed for the regional health authorities, not the individual hospitals. More detailed input and aggregated data from several administrative and clinical sources would make it possible to create rich, relatively structured, 'clean' datasets suitable for machine learning (6). This is a form of artificial intelligence (AI) whose strength lies in identifying correlations that are otherwise easily overlooked. The methods used can be explained and verified, and there is thus no 'black box' in machine learning that can compromise privacy, as is currently the case for deep neural networks (7). A number of international studies otherwise use predictive models for early detection of sepsis in hospital settings, and clinical support systems are also utilised (8).

> ***«More advanced training in diagnostic coding for hospital doctors is unlikely to be the way forward»***

Another more 'low-hanging fruit' would be to examine the use of clinical coders in our healthcare institutions. As the article also points out, coding by these experts has been shown to be much more accurate than that of doctors, but it is unknown to what extent clinical coders are used. Nevertheless, more advanced training in diagnostic coding for hospital doctors is unlikely to be the way forward. The training for specialty registrars is already very time-consuming, and most probably find the learning objectives more oriented towards practising medicine than specialising in coding.

Comparing the findings of the well-executed study by Skei et al. with international research can enrich our understanding of the complexity of sepsis treatment and serve as an aid to best practice. Various medical communities in Norway are working diligently and systematically to promote improvement in sepsis treatment. Through their united efforts, and with participation from other interested healthcare personnel, researchers, decision-makers – and AI – we can effectively address the challenges that remain.

REFERENCES

1. Skei N. Kodepraksis ved sepsis i Norge 2008–2011. Tidsskr Nor Legeforen 2024; 143. doi: 10.4045/tidsskr.23.0271. [CrossRef]

2. Singer M, Deutschman CS, Seymour CW et al. The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3). JAMA 2016; 315: 801–10. [PubMed][CrossRef]

3. World Health Organization. International Classification of Diseases and Related Health Problems 10th Revision. https://icd.who.int/browse10/2019/en Accessed 5.2.2024.

4. Trydal E, Martinsen AB, Beisland F et al. Strukturert mottak av sepsispasienter og oppstart av antibiotika. Tidsskr Nor Legeforen 2019; 139. doi: 10.4045/tidsskr.18.0216. [PubMed][CrossRef]

5. Pedersen G, Schønheyder HC, Sørensen HT. Source of infection and other factors associated with case fatality in community-acquired bacteremia–a Danish population-based cohort study from 1992 to 1997. Clin Microbiol Infect 2003; 9: 793–802. [PubMed][CrossRef]

6. Labcoff S. Registry Science: where medicine and data science intersect. News Medical 22.11.2023. https://www.news-medical.net/health/Registry-Science-where-medicine-and-data-science-intersect.aspx Accessed 5.2.2024.

7. Schwartz IS, Link KE, Daneshjou R et al. Black Box Warning: Large Language Models and the Future of Infectious Diseases Consultation. Clin Infect Dis 2023; 0. doi: 10.1093/cid/ciad633. [PubMed][CrossRef]

8. Boussina A, Shashikumar SP, Malhotra A et al. Impact of a deep learning sepsis prediction model on quality of care and survival. NPJ Digit Med 2024; 7: 14. [PubMed]

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