Author's response to reviews

Title: Evaluation of the national surveillance system for point-prevalence of healthcare-associated infections in hospitals and in long-term care facilities for elderly in Norway, 2002-2008

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Author's response to reviews: see over
Dear Editor,

Thank you for your letter with the reviewers’ comments on our manuscript. We thank the reviewers for many important and valuable comments and insights. We addressed the points raised in the revised text, and below we respond in detail to each comment.

Reviewer 1: Benjamin Silk

Reviewer's report:
Major Compulsory Revisions

1. The methods section needs far more detail to clarify how certain attributes (e.g., simplicity) were actually measured or evaluated. With the current content, the reader can only determine that the methodological approach was a mix of surveys, interviews, and data reviews; none of these are described further. For example, a conclusion is reached that the system is simple but there is no information on how exactly simplicity was measured/evaluated. Similarly, it is determined that “Users consider the protocols comprehensible at most points,” but measurement of comprehensibility is not specified. Did the questionnaire use a Likert scale? Were qualitative, interview data synthesized? The reader can only guess. Similar comments sometimes apply to other surveillance attributes.

Our response: Yes, a combination of qualitative and quantitative methods was used in the evaluation. We have included two additional files: the content of the electronic questionnaire sent to the infection control practitioners in hospitals, and the content of the one-page questionnaire targeting hospital personnel involved in the prevalence surveys. Furthermore, we added two new tables on the assessment of the national protocol by the users. Simplicity has been assessed mainly by the structure and data requirements of the surveillance.

The points above have been now clarified in the text:

Material and methods:
“A combination of qualitative and quantitative methods was used to collect information: targeted surveys (...)”

“In 2007, a structured electronic questionnaire (See additional file 1: Survey among ICPs) was sent to one infection control practitioner (ICP) in each of the 50 main hospitals in Norway (...)”
“In addition, a one-page questionnaire (See additional file 2: Survey among ward personnel) to assess compliance with the surveillance methodology was distributed to hospital ward personnel (...)”

Results:
“The following data are collected: name of institution, contact person, total number of patients on antimicrobial treatment, departmental response rate, non-participating departments, and by medical specialty/LTCF department: total number of in-patients/residents at 8 am on the survey day, total number of operated patients, total number of HAI by type of infection, total number of HAI acquired in the own institution, and total number of HAI acquired in another healthcare institution.”

“The surveillance system has a simple structure regarding the levels of data flow (figure 3). Data collection forms require only the most necessary information for establishing the numerators and denominators. Users consider the protocols comprehensible at most points, though one in ten ICPs and contact persons noted that certain issues (aim of registration, unit-level form, and presentation of results) are not made completely clear (table 1 and table 2).”

Discussion
“The system is considered structurally simple and timely by those who are responsible for surveillance at national level."

2. The evaluation is ostensibly based on the U.S. Centers for Disease Control’s (CDC) “Updated Guidelines for Evaluating Public Health Surveillance Systems,” which includes nine attributes (simplicity, flexibility, data quality, acceptability, sensitivity, predictive value positive, representativeness, timeliness, and stability). A similar, but not identical list of attributes is evaluated in the authors’ report. Of course it is not essential that the same nine attributes from CDC be evaluated, but an explanation of the rationale for using different attributes would be helpful.

Our response: The evaluation methodology was primarily based on the cited CDC reference, yet other important references were also used which, to a certain degree, differ from the CDC recommendations. Sensitivity and predictive value positive were included within the evaluation of validity. No specific evaluation of stability (reliability and availability) deemed necessary when the evaluation method was tailored to the surveillance system’s purpose and structure, e.g. taking into account that there is no continuous electronic data collection. All other attributes were included in the assessment.

We have modified the text to reflect these points.

“Guidelines for the evaluation of surveillance systems developed by the Centers for Disease Control and Prevention (CDC) and other key references were used in this assessment. [6-8]"
Attributes addressing primarily implementation and compliance issues were evaluated because of their importance to the national HAI surveillance.”

3. The report refers to CDC case definitions for HAIs, but these definitions are not provided and there is no associated reference to the CDC document(s). As such, it is not possible to know what exact HAIs are actually being monitored by surveillance; furthermore, the evaluation of these case definitions is unclear. The report also refers to the NIPH website and other references that describe the case definitions, but realistically many readers will not invest time to search for these other references in order to understand the authors’ report. Therefore, a clear presentation of the case definitions in the report itself is recommended.

Our response: The comment is absolutely justified. In the Results section we have now explicitly stated the type of HAIs under national surveillance in the different institutions, and included a figure on the case definitions:

“The system is described in details both in the surveillance protocols that are available on NIPH’s website (www.fhi.no) and in previous publications. [8-10] NIPH requires information on the occurrence of the following type of HAIs: infections of the urinary tract, lower respiratory tract and surgical site both in hospitals and LTCFs, whereas sepsis (bloodstream infection) and skin infections only in hospitals and in LTCFs, respectively. The case definitions used and references are shown in figure 2.”

Minor Essential Revisions
1. References to table numbers in the text should be checked and corrected.

Our response: We checked and corrected the references to table numbers.

2. Under study of validity, the text suggests a comparison of site of infections as the focus of the evaluation. However, the corresponding table (table 2) suggests measurement of whether any HAI was recorded or not. It would be helpful to resolve this potential ambiguity.

Our response: We modified the text according to the suggestion and added the results in the text (due to table formatting issues) which now reads as:

“Merged results for identifying HAIs by ward personnel in the two hospitals showed a sensitivity of 69% (9/13; 95% CI: 44-94%), specificity of 96% (203/212; 95% CI: 93-99%), positive predictive value of 50% (9/18; 95% CI: 27-73%), and negative predictive value of 98% (4/207, 95% CI: 96-100%), as compared to the independent assessment by the evaluation team. Detailed, case-to-case comparison of the findings revealed that among the nine HAIs registered both by ward personnel and the evaluation team, site of infection differed in four cases.”
3. At least two sentences include vague date references that could be clarified. Under other validity issues, the first sentence reads “… organise one or both surveys on other dates.” This may leave the reader wondering whether these other dates were generally proximal or distal to dates announced by NIPH. Under timeliness, the first sentence reads “… in the days after the survey.” Knowing how many days this actually is seems importance for characterizing timeliness.

Our response: Unfortunately other dates were not explicitly asked about; nonetheless in “free text” answers several of these hospitals indicated no substantial difference. We prefer not to include this information since data was not systematically collected. We have further clarified the time-perspective of summarizing data at hospital level which now reads as:

“Unit-level forms are collected on the day of or, in large hospitals, within 2-3 days after the survey."

4. In Table 3, the meaning or significance of “use of 48 hours cutoff” is not readily apparent. An explanatory footnote would be valuable.

Our response: We have added the following footnote to the table in question:

“Healthcare-associated infection: an infection that is associated with a stay in a healthcare institution and that was not present or in the incubation period (=48 hrs) at the time of admission.”

Discretionary Revisions

1. In the introduction, data on the frequency of HAIs in Norway would help orient the reader to the scope and size of the problem of HAIs. Presumably these data are readily available to the authors since Eriksen (a coauthor) and others have previously published similar data. To a lesser extent, the prevalence of HAIs in hospitals and long-term care facilities (LTCFs) is later presented as results under the subheading ‘usefulness.’ Yet, this presentation could also do more to demonstrate how the surveillance system has met its objectives in relation to actual prevention and control of particular types of HAIs through specific interventions and awareness. Ultimately, this would be the most meaningful evaluation of the surveillance system.

Our response: We have added a sentence on the prevalence to the Introduction section:

“The overall prevalence of the four types of HAI included in the national surveillance was 5.1-6.4% in hospitals and 6.3-7.8% in LTCFs between 2002 and 2008.”

We have also modified the relevant paragraph in the Results section:

Usefulness

“National baselines for overall and infection-specific prevalence were established both in hospitals and LTCFs (figure 4 and figure 5). In the frame of a governmental initiative, Free
Hospital Choice Norway, launched in 2003, results of the surveys are made available to the public among several other indicators (e.g. waiting time) to help patients to get detailed information on the hospital in which they seek or undergo treatment. National prevalence data gave background information to a national action plan against HAIs issued by the Ministry of Health in 2004, and contributed to the formulation of a strategic goal of further improving surveillance of HAIs in Norway by means of incidence surveys. [14] The results also gave baseline data for a national hand hygiene campaign in hospitals and LTCFs in 2005. [15] An ecologic study has shown that prevalence rates of HAI in a hospital may associated with the amount of hand hygiene products used. [16]

Furthermore, we have modified the relevant paragraphs in the Discussion section:

“Fulfilment of objectives

Objective 1) The surveillance system provides data regarding both hospitals and LTCFs, and has been reliably running since 2002. Each institution which has participated in at least a couple of surveys could set their own baseline values for prevalence and distribution of HAIs. National benchmarks have been established.

Objective 2 and 3) Several hospitals and LTCFs identified areas for improvement and initiated IC interventions based on their data. The national prevalence rates, increased awareness given to the area and known methodological shortcomings of the cross-sectional approach contributed to the development of targeted prospective surveillance (NOIS) in 2005, supported by a national action plan and related legal framework.

“The surveillance system has been proven to be useful. Though the overall prevalence has been relatively stable over the years, the results gave basis for actions at national level to facilitate prevention and control of particular types of HAIs. Further, more targeted interventions may be necessary to reach an actual reduction in prevalence rates. [29] At institutional level, results are more used in hospitals than in LTCFs to implement targeted IC measures, but also to argue for more IC resources. Even though few LTCFs reported action taken based on their results, the surveys undoubtedly increase awareness and knowledge on the issue of HAIs in care facilities and possibly foster the development of IC programmes in these institutions. Nonetheless, results of the prevalence surveys at institutional level should be interpreted carefully, even in case of repeated surveys, especially if events are rare. Concerning inter-hospital comparisons, the importance of adjustment for case-mix has been shown in previous studies. [30, 31] The use of crude rates as quality indicators for hospitals should be avoided.”

2. It would be interesting to know the relative frequencies of the particular acceptability issues that were cited. This would help the reader identify those issues that are especially important, given that many issues were identified among hospitals and LTCFs (technical problems, lack of resources, etc).

Our response: We have added the numbers in the text and listed the answers in descending order of frequencies:
Acceptability

“Reasons for non-participation listed by the three hospitals were technical problem, high workload due to incidence-based surveillance, and lack of resources. In LTCFs, with the number of answers shown in brackets, reasons included lack of resources or personnel (14), lack of surveillance protocol (10), no information on the timing (5), that it was forgotten by the personnel (5), or no request to conduct the survey (3). No knowledge on the implementation (1), technical problem (1) and heavy workload (1) were also mentioned.”

3. The discussion section’s content could be improved with a comparison to other relevant studies or similar evaluations, assuming they exist. Notably, there are no citations in the discussion, which is unusual.

Our response: While a number of European countries (e.g. Netherlands, Denmark, Spain) established a surveillance system for the prevalence of HAI, we could not find any publication, articles or reports in the scientific literature on comprehensive evaluation of these systems. It was beyond the scope of our evaluation to compare in details the outputs of the Norwegian system to results from other countries due to methodological differences. Nevertheless, we have now added a paragraph on links to other surveillance systems, including international comparison:

Links to other surveillance systems

“(…) The prevalence of HAI in Norway has been comparable to findings in other countries [20-24], on the other hand several methodological differences may apply, including the selection of patients and hospitals, qualification and training of investigators and methods used to identify HAIs. [25]”

We have further elaborated the Discussion session, and in addition to the previous citations we have included 11 references to the Discussion (20-24, 28-31).

4. Is the second figure (the screenshot of the data entry screen) useful given that most English readers will not understand the content of that webpage? An equivalent version of the webpage may not exist in English, so a decision to omit the figure may be needed.

Our response: There is no English version of the data entry screen available, and we agree that the Norwegian version might have limited value to the reader. The figure is now omitted.
Reviewer 2: Jean-Michel Thiolet

Reviewer's report:
Major Compulsory Revisions

1. Such evaluations are not so often published and this paper should be interesting. Nevertheless, we are in 2011: data provided by the network from 2004 to 2008 were analysed, questionnaires were sent in 2007. So, some questions rise up:
- why this delay?
- this evaluation is still relevant?
- how was performed the dissemination of the results to contributors and users of the system?

Our response: After the evaluation was conducted and a detailed report was written, time and efforts were primarily devoted to discussions on highlighted areas for improvements and implementation of agreed and accepted changes. The evaluation report has been published in Norwegian at the website of the Norwegian Institute of Public Health, discussed at meetings with stakeholders and presented in part at an international conference.

We believe that the process, tools used and findings of this specific evaluation are relevant and may be of particular interest to other countries which have or are planning to implement a similar surveillance system. We would especially like to point to the fact that several European countries, as part of an ECDC initiative, will be setting up such prevalence surveys in the coming years.

2. Incidence surveillance network provide also data in Norway (at least for data sent to ECDC). The authors should discuss the links between the different networks.

Our response: We have added a new paragraph to the Discussion section:

Links to other surveillance systems on HAI

“Another data source on HAI is the Norwegian surveillance system for healthcare-associated infections (NOIS). While the national coordination is organized similarly, the two systems are running independently from each other. The surveillance based on prevalence surveys is institution-wide and collects aggregate data on the presence of the most common type of HAIs on the survey day, whereas the NOIS is based on incidence surveys, collects patient-based data and at present, covers only surgical site infections after certain surgical procedures. [18, 19] Results of the NOIS were therefore not utilized in this evaluation.”
3. Results of prevalence survey at the hospital level should be interpreted carefully, even in case of repeated surveys, especially if events are rare. This point should be discuss.

Our response: We fully agree with this concise opinion. This point has been added to the relevant Discussion section:

“Nonetheless, results of the prevalence surveys at institutional level should be interpreted carefully, even in case of repeated surveys, especially if events are rare. Concerning inter-hospital comparisons, the importance of adjustment for case-mix has been shown in previous studies. [30, 31] The use of crude rates as quality indicators for hospitals should be avoided.”

4. This evaluation should include the point of view from users of the data not only at the hospital level. Why, this evaluation was not done?

Our response: This was an organizational and resource issue during the process of the evaluation. We have added the following sentence to the limitations in the Discussion section:

“Due to lack of resources, the evaluation did not include the point of view of other users of the data, e.g. health politicians, hospital managers.”

5. Data were used to support a national program against HAI: the authors should provide details in order to answer to this question: to what extent the data contribute to planification?

Our response: The national action plan to prevent HAI for the period of 2004-2006 targeted three strategic goals: 1) establishing an improved surveillance of HAIs, 2) improving preventive measures concerning HAIs, and 3) strengthening research activities. Prevalence rates provided background for the assessment of occurrence of HAIs in Norway. In the frame of the 1st goal advantages and disadvantages of the cross-sectional method were discussed, and the necessity of a more sophisticated surveillance method was recognized, which would allow more systematic surveillance of HAI and underlying pathogens.

We have added more information on the national action plan on HAI in the Results and Discussion sections, and included a reference to the document.

Usefulness
“(…) National prevalence data gave background information to a national action plan against HAIs issued by the Ministry of Health in 2004, and contributed to the formulation of a strategic goal of further improving surveillance of HAIs in Norway by means of incidence surveys. [14]”

Fulfilment of objectives
Objective 2 and 3) Several hospitals and LTCFs identified areas for improvement and initiated IC interventions based on their data. The national prevalence rates, increased awareness given to
the area and known methodological shortcomings of the cross-sectional approach contributed to the development of targeted prospective surveillance (NOIS) in 2005, supported by a national action plan and related legal framework.

Other amendments:

We indicated more precisely the differences between hospitals and long-term care facilities in legal terms of reporting requirements.

Introduction
“(…) While both types of institutions are obliged to have surveillance of HAI, only results from hospitals are demanded and requested by Free Hospital Choice Norway, a governmental initiative on patients’ rights. [2]”

We changed 2004 to 2002 in the title of the manuscript. The review of the national database was limited to the period of 2004-2008, yet the presented prevalence rates and usefulness indicators cover the whole period between the launch of the surveillance system and the evaluation.

We have briefly elaborated on the validation issue, and pointed out the importance of existing IC programmes in long-term care facilities:

Results
Other validity issues
“Systematic, routine validation procedures have not been established at national level.”

Discussion
System attributes
“(…) Also, participation was considerably higher among those LTCF with IC programme than those without it, highlighting that availability of expertise, and presumably managerial support, may have an important impact on surveillance activities in this healthcare sector.

“(…) Additionally, validation is a key aspect to assure accuracy of HAI surveillance data. [28]”

Furthermore minor modifications have been made in style.

We look forward to your reply and would be happy to consider any further revision suggested.

Sincerely,
Agnes Hajdu