



Good enough? Surgical Site Infection Surveillance Data Compared to Administrative Data in Norway 2005-2010

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Background

This study compares surgical site infection (SSI) data in the Norwegian Surveillance System for Healthcare-Associated Infections (NOIS) (1) to administrative data in the Norwegian Patient Register (NPR) (2) on an aggregated level. This is achieved through (i) describing data quality by evaluating coverage, completeness and representativeness of denominator data and (ii) investigating the reason for any discrepancies between NOIS and NPR; both largely automated systems for data collection.

Methods

We compared denominator data in NOIS with NPR, considered the "gold standard" for activity in Norwegian hospitals, for the years 2005-2010. Because NOIS is de-identified, the comparison was performed on an aggregated level. We broke the data down by several variables and compared the distribution of the events within each grouping by register.

It is only mandatory to report on one of the procedures, and for a 3-month period (September through November) each year. We have included the following surgical procedures (in order of priority):

1. Coronary artery bypass graft (CABG)
2. Cesarean section (CSEC)
3. Hip arthroplasty (HPRO)
4. Cholecystectomy (CHOL)

Coverage and completeness were calculated for each procedure and representativeness was measured by comparing frequencies for key variables in NOIS with three groups of data in NPR. In this study, discrepancies between the two registers were investigated by evaluating differences between age group, sex and hospital size.

Definitions

Event: One patient undergoing one surgical procedure in one hospital, irrespective of whether the patient develops a surgical site infection or not.

Coverage: The proportion (in %) of events in NOIS as compared to NPR during the three-month surveillance period. We calculated coverage for each of the surgical procedures for each year and for the entire period.

Completeness: (completeness of reporting) the proportion (in %) of events in NOIS, compared to the number of events in NPR during the corresponding months in the hospitals which submitted data to NOIS. We calculated completeness for each of the surgical procedures for each year and the entire period.

Representativeness: Comparing the frequencies of values for key variables for events recorded in NOIS to the same frequencies in NPR: We used the following key variables; age group, sex, and hospital size.

Results and Discussion

After processing of the NPR-data, a total of 161,868 records from NPR remained. We then extracted the 3-month period which NOIS represents, leaving 45,113 records. All 26,263 records from the 3-month surveillance period from NOIS were included.

NOIS had a total coverage of 58% of the procedures reported to NPR for the whole period. Procedure specific coverage varied from 12% to 96% depending on priority of the procedure in the surveillance system and year.

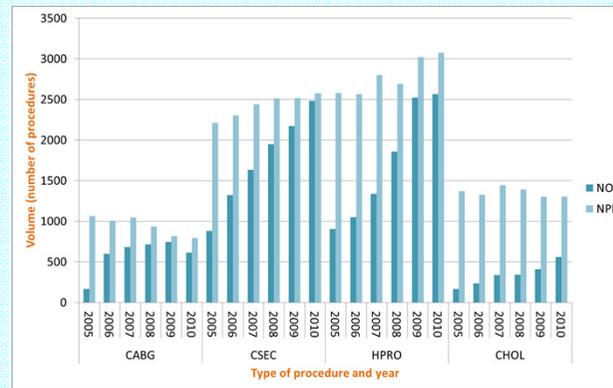


Figure 1. Coverage of surgical site infection surveillance in the Norwegian Surveillance System for Healthcare-Associated Infections, 2005-2010

The overall completeness was 96%, varying from 71% to 100% with the largest discrepancies occurring in the first years of NOIS. For HPRO some are over 100% because some patients have had two hips replaced and we have not been able to correct for this in the NPR data.

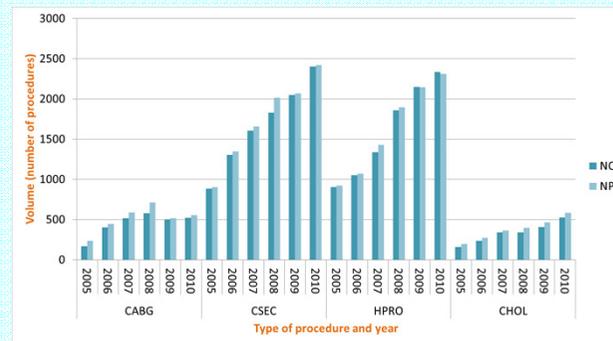


Figure 2. Completeness of surgical site infection surveillance in the Norwegian Surveillance System for Healthcare-Associated Infections in matched hospitals, 2005-2010

Some of the discrepancy in completeness can be explained by hospitals not correctly interpreting the surveillance protocol, and thereby not including all procedures when reporting. There may also be differences in the way the automated systems harvest data.

NOIS is representative in terms of the sex and age distribution. However, during the first few years of the surveillance system, many large hospitals were exempted from participation. This influenced the representativeness by hospital size adversely in 2005-2007, but improved in 2008-2010.

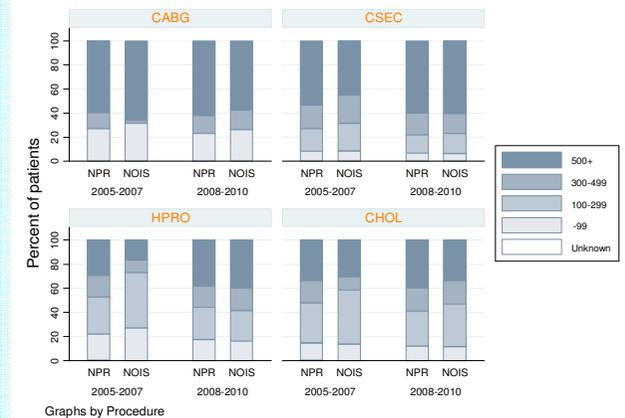


Figure 3. Representativeness of the procedures included in NOIS versus NPR in 2005-2007 compared to 2008-2010 by hospital size and procedure in matched hospitals

Conclusions

Is NOIS "good enough"? Although NOIS is not person identifiable, thus limiting the data analysis to comparison on an aggregated level, we see indications that NOIS and NPR denominator data are very comparable. In order to validate NOIS in-depth, linked data are necessary.

From 2013 we have implemented all-year (continuous) surveillance and mandatory monitoring of all 5 surgical procedures (including colon surgery) in the surveillance system.

References

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