

Name of the public institution

Federal Public Service (FPS) Public Health, Food Chain Safety and Environment
(<http://www.health.fgov.be/>)

Name of the project

Database 'Quality of Nurse Care'

Acronym

Quali_NURS

Description of the project and situation within the framework of the institution

The proposed study is aimed at developing indicators on the basis of the coupled Clinical Minimal Data Set (CMDs) and Nursing Minimal Data Set (NMDS) for the registration year 2000 and subsequent available registration years at the beginning of the study, which analyses the relationship between the nursing staff and the quality of care at different aggregation levels (hospital, ward, group of pathologies).

Reasons for this study are to be found in studies and policy decisions.

There is a spate of studies investigating the relationship between nurse staffing and the quality of care (Aiken et al. 2002b, Aiken et al. 2003, Hickam, 2003, Needleman et al. 2002). Those studies show that there is sufficient evidence to assume that the higher the nurse staffing is, the better the results of the care are.

The majority of these studies use retrospective research through administrative data sets. With the Nursing Minimal Data Set (NMDS) and the Clinical Minimal Data Set (CMDs), the Federal Public Service Public Health has at its disposal databanks allowing similar research in the Belgian setting.

Both registrations are compulsory for all general Belgian hospitals. This data can be coupled by means of the unique 'stay number'. The coupled data can lead to further exploitation.

The decennial analysis of the Clinical Minimal Data Set carried out by the Federal Public Service Public Health, Food Chain Safety and Environment has shown that there is a growing skill mix, but also a more intensive patient care.

The Federal Government Agreement of July 2003 aims at paying more attention to control more and better the quality of the provided care (Federal Government Agreement of July 2003, p. 42).

Federal Minister Rudy Demotte, who's responsible for Public Health, has consequently worked out a strategic plan for the nursing profession. One of its elements is the development of magnet hospitals by means of pilot projects. Magnet hospitals differentiate from other hospitals by leadership, nursing practice and professional development. Conditional flexibility is, in this regard, one of the main points.

The national council of healthcare institutions (NRZV-CNEH) has recently adopted an opinion on relaxing the standards concerning the staff. Relaxing the standards should allow to give an appropriate answer to different and changing situations. It is not only important as regards the budget, it is also a signal of good governance and ethic. In order to relax the human resources standards leaving nothing to chance, prior scientific research is necessary.

Finally this study must contribute to a further 'professionalisation' of nursing.

In order to make visible the relationship between the nurse staffing and the quality of care, two types of indicators sets have to be developed.

A first set includes indicators concerning the nurse staffing. Those indicators can be calculated on the basis of the MNDS and FINHOSTA data bank. Specific indicators have already been explained on the basis of the Minimal Nursing Data Set. Other indicators can be developed. Apart from the data concerning the staff, nursing activities are also recorded in the NMDS.

This data makes it possible to evaluate the nurse staffing depending upon the nursing care intensity.

A second and new set of indicators should allow a mapping of the care quality. The literature deals extensively with patient outcomes which can be deduced from discharged patients data banks like the CMDS (Aiken, 2002b, Needleman et al., 2002.). These are often adverse outcomes like decubitus, urinary tract infections and shock. Since the occurrence of patient outcomes is influenced by differences in case-mix, a control of it has to take place. It is possible by using the Severity of Illness and Risk of Mortality classes of the APRDRG or other weighing methods. It is also necessary to examine if there is a relationship between the occurrence of the different patient outcomes. Such a relationship would imply that there is a continuum between a "safe" hospital (efficient for all patient outcomes) and an "unsafe" hospital (not efficient for all patient outcomes).

Finally it is necessary to take the present NMDS actualisation into account. The data set principle has to be workable after implementation of the actualised NMDS.

The result is a data set of indicators that can be put at the disposal of policy-makers and researchers by public authorities through the Internet. Feedback reports on nurse staffing, quality of care and the relationship between each of those indicators can be generated through that Internet application.

Tasks to be accomplished

a. By the research team:

- Developing indicators on the basis of the already coupled NMDS and CMDS databanks for the registration year 2000 and subsequent registration years if available at the beginning of the study, reflecting the relationship between the nurse staffing and the outcome. Those developed indicators have to allow aggregations depending on the application "nurse staffing and quality of care" at different levels (hospital, wards, groups of pathologies). The results must be easy to obtain and allow benchmarking with other hospitals, wards or groups of pathologies, based on a correct analysis.
- Using indicators existing in the FPS Public Health, like the NHPPD (nursing hours per patient day).
- Checking the relationship with the FINHOSTA and hospitals statistics registration, which information those registrations give and what can be improved concerning those registrations in order to develop additional indicators.
- Taking into account the findings and results of the BOS-research "*Analytisch model van de financiële stromen in functie van de patiëntenmix*" (analytical model of the financial flows depending on the patient mix) carried out by KULeuven, AZ-VUB and Erasmusziekenhuis, where coupled hospital data has already been used.
- Developing algorithms making possible the relationship between the nurse staffing and the quality of care (outcomes), using SAS.
- Developing a methodology, technical aspects and calculation modules in cooperation with the FPS Public Health in order to accomplish a full integration of the applications in the FPS.
- Transposing the indicators into the actualised NMDS.
- Testing these indicators on the actualised NMDS.
- Comparing the developed methodology with the methodology used in the studies carried out by Aiken and Needleman, as well as similar studies in European countries.
- Working temporarily in the FPS Public Health in order to accomplish a full integration.
- Assuring the anonymity of the furnished coupled data.

b. By the public institution:

- Putting at disposal the coupled NMDS-CMDS from the registration year 2000 on and for subsequently available registration years at the beginning of the study, FINHOSTA and hospital statistics.
- Organising in the course of the project 2 consultation moments per month between the scientific team and the FPS Public Health during the whole project.

- Making public the relevant results.
- Providing the necessary logistics in order to allow the members of the scientific team to work temporarily inside the FPS.
- Assuring the anonymity of the data.

Expected final product

a. By the research team

Furnishing indicators (algorithms) based on the coupled NMDS-CMDS databanks. Through further refining and validating existing indicators together with newly developed indicators, it must be possible to compare nurse staffing and quality of care at different levels – hospitals, hospital wards, groups of pathologies – with the help of NMDS and CMDS. This implies a generic building of the coupled file. Queries make it possible to subsequently compare the staff indicators with the outcome indicators at different aggregation levels. It is for instance possible at the hospital level, where the hospital global staffing is compared with the quality of care for all patients. The staffing of wards curing specific patient groups – for instance per DRG – can be compared with the quality of care in that patient group. Another possibility is a comparison at the ward level. Nurse staffing in geriatric wards can thus be compared with patient outcomes in geriatric wards.

b. For the public institution

The data set with indicators will be designed in a way that allows the FPS Public Health to put it annually at the disposal of policy-makers and researchers (hospital managements, professional organisations, public organisms, universities) through the Internet.

Valorisation of the final product

a. For the public institution: integration of the final product in its own functioning

The Federal Public Service Public Health, Food Chain Safety and Environment has an important task to support the hospital management in its policy-making. The FPS Public Health can employ the data set for staffing and quality audits. In addition, thanks to the data set, public authorities will be able to look at the most suitable standards concerning the staff in order to guarantee safe patient care. Furthermore, the data set gives information to policy-makers at different levels in order to direct their management.

b. For the "public": access conditions and procedure for scientific researchers and the general public:

b.1. Hospitals

The data set offers hospitals the opportunity of benchmarking, concerning as well nurse staffing as quality of care. In addition, the coupled data set gives hospital managements indications to help them determine what minimum nurse staffing has to be allowed in order to guarantee a safe patient care. The indicators can give indications of quality problems in hospitals, which can be partly caused by the nurse staffing.

b.2. Professional nursing organisations

By means of the data set, the professional nursing organisations will have at their disposal information contributing to the further professionalisation of nursing. The data set will help to demonstrate the impact of nursing care on the quality of care for the patient.

b.3. Researchers

The data set gives researchers a data source to further investigate the relationship between nurse staffing and quality of care. The data set allows analyses over time and at different aggregation levels. The relationship between nurse staffing and quality of care in Belgian hospitals can also fit in with studies carried out on an international level.

Timing, planning and allocated budget

a. timing of activities

1 September 2005 – 28 February 2007.

b. planning of activities: phasing of the tasks

1. *for the research team*

*Literature study (September 2005 – October 2005, 2 months)

The literature study must include an exploration of similar studies in the European Union, examining the relationship between nurse staffing and patient outcome. The studies by Aiken and Needleman that have already been referred to can also form the basis of the methodology that has to be used, just like useful studies from other countries. If it appears that there is a better methodology at hand than the one the study refers to, the better methodology can be used. The literature study must allow to define a set of indicators, taking into account the Belgian situation.

*Drawing up and testing indicators and developing algorithms coming from the coupled NMDS-CMDS data set from the coupled available registration years (November 2005 – Augustus 2006, 10 months).

Developing algorithms in order to deduce the selected outcome indicators from the ICD-9-CM codes.

Developing algorithms in order to deduce the selected staff indicators from the NMDS data set, FINHOSTA and hospital statistics.

The research team has to deduce the indicators from the coupled NMDS-CMDS data set and have it validated by the sector.

*A measure evaluating the intensity of the nursing care on the basis of the nursing activities is developed. That measure allows to adjust the staff indicators for the intensity of the nursing care.

*By means of multivariate analysis, the potential existence of a connection between the different patient outcomes and the staff indicators will be examined.

*The programmes to transpose the patient outcomes from the stay level to the level of the pathology groups, type of ward or hospital are in development. The programmes to transpose the indicators concerning the nurse staffing from the nursing ward level to the level of the ward or teams for specific pathology groups are also in development.

*The relationship between the indicators concerning nurse staffing and the indicators for the patient outcome is for instance developed by means of regression analysis. Domestic and foreign experts compare and discuss these results.

*validation with the sector (September 2006 – December 2006, 4 months)

development of feedback tools including the indicators developed for the coupled data set. Propositions to the hospital sector.

*Final report + implementation at the level of the FPS (January 2007 – February 2007, 2 months)

2. *for the public institution*

Making the coupled NMDS-CMDS data set available for the researchers in November 2005.
Organising in the course of the project 2 consultation moments per month between the scientific team and the FPS Public Health during the whole project.
Organising accompanying committees during the whole project.
A budget has to be provided in 2006 in order to introduce the data set.
The development and introduction must become a reality in 2007.

A proper follow up is necessary during the whole project depending on the use and the possibilities in the NMDS actualisation.

Particular Conditions

a. suggestions for the steering committee composition

A steering committee has been created within the framework of the scientific study on the Nursing Minimal Data Set actualisation; it is composed of experts from hospitals, professional organisations and public administration. For the continuity and consistency, it is asked that the same people are involved in the study. In addition, representatives from the FPS Public Health, the federal expertise service (KCE), the Federal Science Policy and scientists coming from the 3 regions representing added value are required.

b. data confidentiality clause (if applicable)

A confidentiality clause has to be introduced between the SPF Public service and the scientific team in order to anonymize the data.

c. Presence of the research team within the institution (if applicable)

In order to obtain a full integration in the daily functioning, the presence of the research team inside the FPS Public Health is required during a certain period of time before the definitive delivery.

d. other

The scientific team must at least consist of a scientific collaborator-doctor, a scientific collaborator-nurse and a statistician as a back-up.
The algorithms have to be written in SAS. At least a part of the scientific team has to be able to work with that tool.