

# IMPROVEMENT OF A NATIONAL PUBLIC HEALTH SURVEILLANCE SYSTEM THROUGH USE OF A QUALITY CIRCLE

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Surveillance systems for infectious diseases build the basis for effective public health measures in the prevention and control of infectious diseases. Assessing and improving the quality of such national surveillance systems is a challenge, as many different administrations and professions contribute to a complex system in which sensitive information must be exchanged in a reliable and timely fashion. We conducted a multidisciplinary quality circle on the national public health surveillance system in Germany which included clinicians, laboratory physicians, and staff from local and state health departments as well as from the Robert Koch-Institut. The recommendations resulting from the quality circle included proposals to change the federal law for the control of infectious diseases as well as practical activities such as the change of notification forms and the mailing of faxed information letters to clinicians. A number of recommendations have since been implemented, and some have resulted in measurable improvements. This demonstrates that the applied method of quality circle is a useful tool to improve the quality of national public health surveillance systems.

Euro Surveill. 2006;11(10): 246-8 Published online November 2006

**Key words:** public health, quality circle, quality management, surveillance systems, recommendations

## Introduction

In 2001 the infectious disease control act (IfSG) in Germany resulted in the implementation of a completely restructured and technically modernised national surveillance system for notifiable infectious diseases. The most important changes were:

- The number of diseases to be notified by physicians was reduced from 52 to 17, while the number of pathogens to be notified by laboratories was increased from 52 to 53.
- Case definitions were introduced whereby local health departments must verify notifications before reporting them to the next level.
- The federal surveillance institute (Robert Koch-Institut, RKI) became the agency responsible for defining the technical standards by which data is to be reported to the national level, which has resulted in the implementation of a complex electronic database network. Local health departments (LHD) receive paper based case notifications from physicians or laboratories. LHDs forward the case reports electronically using software either produced by the RKI and offered free of charge or one of five commercially available software packages tailored for health department administration [1-3].

The Federal Ministry of Health in Germany formally asked all 16 state health administrations and the RKI to report their experiences with the new infectious disease control law in order to collect suggestions for a future revision of the law. By 2003 the RKI had conducted a focus group discussion of public health physicians, a survey among general practitioners and a survey among local health

departments as part of our comprehensive quality management efforts [4-6]. On the basis of these studies we intended to assess the experiences with the new surveillance system by taking into account the different perspectives of the various professions and institutions contributing to this system. We decided to conduct a quality circle, which is an instrument of quality management, generally consisting in a group of stakeholders or other affected persons of a specific process who discuss, in a structured way, needs and ways to improve specific processes. The aim of this quality circle was to identify possibilities for technical or organisational improvements of the system and to recommend changes to be made in a potential revision of the legal framework.

## Methods

The quality circle (QC) took place on 4-5 March 2003 in Berlin. Members of the different professions and institutions were invited and grouped by structural level of the surveillance system:

- 1) Notifiers: hospital clinicians (2 persons), general practitioners (2), and laboratory physicians (2)
- 2) Local public health level: public health nurses (2) and public health physicians (2)
- 3) State public health level: representative of state health department (1), medical epidemiologists in state surveillance institute (2)
- 4) Federal public health level: data management personnel at RKI (3), epidemiologists at RKI (3).

We selected the 19 participants according to the following criteria: the greatest possible number of states and geographic areas should be represented; groups representing the different levels should be of a similar size; only one participant could take part from any one employer or institution (with exception of RKI staff); and no participants with direct hierarchical relationships between each other could participate (so, for example, participants from local public health level must come from different states than participants from state public health level). Participation was voluntary. The participants came from the following eight of the 16 German states: Berlin, Brandenburg, Sachsen, Sachsen-Anhalt, Niedersachsen, Nordrheinwestfalen, Hessen, Baden-Wurtemberg.

The QC was moderated by two external public health scientists. Both moderators were trained and experienced in moderating focus groups and in health system research and had no conflict of interest for the issue to be discussed. The QC was structured in two main phases:

The first phase was dedicated to problem identification. This phase was executed simultaneously in four homogenous groups (groups 1 to 4, as described above). Each group had 2 hours to describe their experiences with the surveillance system and to compile issues for improvement. The groups were asked to present their results on a flip chart without presenting any suggestions on how improvement might be done. These presentations were then discussed in plenary.

Between the two phases, the study results of the focus group discussions, the survey among general practitioners, the survey among LHD and statistical evaluations of the surveillance system were presented to the participants [5-8].

The second phase was dedicated to identifying possible solutions to the identified problems. In contrast to the first phase, participants were regrouped into three heterogeneous groups (A, B, C) with members of

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all structural levels. In this phase, participants were asked to identify possible solutions to the problems previously discussed. The following three questions served as a guide for this process:

- 1) What can be done at each level to improve the quality of the system?
- 2) How can cooperation be improved at the different interfaces?
- 3) What should be taken into account during a revision of the infectious disease control act (IfSG)?

The proposed solutions were discussed in plenary. The moderators collected the presented suggestions and new ideas that have come up during the discussion applying a card based (metaplan) Delphi technique [9]. The recommendations were clustered according to two categories: The first category contained recommendations that can be implemented under the current legal framework of the IfSG, while the second category consisted of recommendations that required changes of the IfSG. Recommendations of the first category were further sorted by the four different levels of implementation.

## Results

### *First phase: problem identification*

#### *1. Problems identified by clinical and laboratory level (group 1):*

1.1 Laboratory work for a notifiable disease is not always medically indicated but represents a burden on the clinician's laboratory budget.

1.2 The notification form is not always readily available and the list of notifiable disease is not known to all clinicians.

1.3 The notification form is complicated.

1.4 Clinicians do not see the benefit of reporting, they are not reimbursed for the time involved in completing and sending the notification.

1.5 Clinicians are reluctant to notify, as they want to prevent their patients from being approached by the public health department. Laboratory notification often reach the LHD before the clinician has informed the patient about the result, which may lead to the situation that the patient first learns about his diagnosis from the LHD and not from his physician.

1.6 Laboratories are uncertain which laboratory results are to be notified and the respective case definitions do not always take newly introduced laboratory methods into account.

#### *2. Problems identified by local public health level (group 2):*

2.1 Notification of rotavirus results in a high workload without any public health consequences.

2.2 Clinicians refuse to provide patient data to LHD upon request if the LHD has received a laboratory notification (currently a strict interpretation of the law does not allow this).

2.3 Notifications by kindergartens and similar institutions often lack diagnostic precision as the kindergarten administrators have no medical training.

2.4 The evaluation of vaccination programs and recommendations has become difficult as various vaccine-preventable diseases are no longer notifiable under the IfSG.

2.5 Reporting of institutional outbreaks (such as nursing homes) require a high work load from the LHD.

2.6 Epidemiological data on some diseases of high public health importance are not notifiable according to the current law.

#### *3. Problems identified by state public health level (group 3):*

3.1 The role of surveillance centers at state level (often not identical with the public health administration of a state) is not legally defined, resulting in unclear responsibilities towards LHD and RKI.

3.2 Interfaces between commercial software and RKI software do not function well, resulting in data transmission or coding errors

3.3 Clinicians' refusal to provide clinical patient data to LHD may hamper the application of case definitions.

#### *4. Problems identified by federal public health level (group 4):*

4.1 Data transfer discontinuity: Information already digitally formatted (e.g. by the laboratory IT system) is transferred to a paper-based text format in order to complete the notification form, sent to the LHD where it must be converted back to a digital format.

4.2 The IfSG is a federal law but the implementation of the law is

the responsibility of the states, resulting in numerous problems of standardisation. (For example, some states have additional diseases or slightly different or complementary conditions, notifiable only in their states, causing confusion and lack of comparability.)

4.3 Insufficient user friendliness of various software packages causes incomplete or false data transmission.

4.4 The large quantity of surveillance data is not analysed and evaluated sufficiently.

### *Second phase: problem solution*

*The following recommendations were identified. They are not necessarily all supported by the authors of this paper:*

First category: Recommendations that can be implemented without revision of the law.

#### *Recommendations to clinicians and laboratories:*

- If a notifiable disease is diagnosed by a laboratory, the laboratory report to the clinician should contain a reminder that this disease is notifiable (in response to problem formulated under 1.2).
- The association of laboratory physicians and other relevant associations should define (based on the national case definitions) the specific laboratory methods and findings that constitute a notifiable condition (1.6).

#### *Recommendations to local health departments (LHD):*

- Define clear contact details for disease notification within the LHD (1.2).
- Improve availability of notification forms by sending sample forms to clinicians (1.2).
- Produce mouse pads, plasticised memos, posters or other reminders that contain the list of notifiable diseases and distribute them to clinicians (1.2).
- Simplify notification forms (1.3).
- Improve visibility of LHDs by presenting the work of LHDs at scientific conferences in order to demonstrate the public health relevance of notification (1.4).
- Improve communication with clinicians (e.g. by distributing information letters, bulletins, and reports via fax or email and by personally welcoming new general practitioners in the county) (1.5).
- Develop a notification form for outbreaks (2.5).

#### *Recommendations to state health departments (SHD):*

- Improve availability of notification forms by publishing it in the journal of the state medical association (which implies, however, that a statewide uniform reporting form is established) (1.2).
- Offer training on reportable diseases at medical schools (1.2).
- Distribute epidemiological reports to LHDs (4.4).
- Provide more training opportunities for LHD personnel (4.4).

#### *Recommendations to RKI:*

- Develop a proposal for simplified notification form (1.3).
- Provide feedback on surveillance data, also through the journal of the national medical association (1.4, 4.4).
- Revise case definitions (1.6).
- Reduce the amount of data to be reported by LHDs (2.5).
- Improve software tool that facilitates identification of the appropriate LHD to notifying laboratories (4.1).
- Develop a national standard for an interface between software used in laboratories and software used by LHDs (4.1).
- Provide more training opportunities for LHD personnel (4.4).

#### *Recommendations for revision of infectious disease control law*

- Detailed provision of patient data by clinicians should be financially compensated (1.2).
- The law should request a national standard which defines which laboratory results are to be notified (1.6).
- If more than one laboratory is involved in identification of specification of a pathogen, there must be a clear rule, defining which one of the laboratories has to notify the result (1.6).
- Sporadic infections with rotavirus should be removed from the lists of notifiable diseases (2.1).
- Clinicians must be obliged and allowed to provide patient data upon request of the LHD if the data is relevant for public health measures (2.2).

- Borelliosis and congenital cytomegalovirus infection should be considered for inclusion (2.4).
- Vaccine preventable diseases not yet included (such as pertussis and tetanus) and infectious meningitis of unknown origin should be included in the list of notifiable diseases (2.4).
- Notification of hepatitis B and C virus infections should also include first diagnosed chronic illness and not be limited to acute infections (2.6).
- Syphilis should no longer be notified anonymously, in order to allow LHDs to conduct investigations (2.6).
- Surveillance units at state level must be given a clearly defined function within the law (3.1).
- Data standards must be uniform and nationally standardised, including the LHD level (and not at state level as it is in the current version) (3.2).

### Discussion

This quality circle generated a number of valuable suggestions and recommendations on how the current surveillance system could be further improved. A methodological variation to most quality circles was that we intentionally invited participants from all affected structural and administrative levels [10]. The two phase approach, in which homogenous grouping was followed by heterogeneous grouping, proved to be successful: Homogenous grouping in the phase of problem identification allowed the participants to express their worries and frustrations without having to worry about hierarchical relationships and conflicting interests that may arise when representatives of different administrative levels come together. The following phase of developing possible solutions then required an interhierarchical and interdisciplinary approach in order to avoid each structural level projecting the need for improvement to another level. The re-grouping also forced the participants to search for solutions to problems which they have not necessarily identified themselves, which supports a pragmatic approach to the process. The presentation of results from previous studies between the two phases allowed the participants to compare their individual experience with data resulting from more quantitative assessments.

We support the majority of the recommendations presented in the result section, but cannot comment on all of them in detail in this report. However, the most important issues supported by our experience and by results of other studies are certainly those that deal with standardisation of information technology and with measures to improve notification compliance.

*A number of recommendations have meanwhile been implemented, as can be seen in the following examples:*

- Delegates of the RKI have been called as external advisors by the Ministry of Health for the revision process of the IfSG, which provided the opportunity to feed the recommendations of this quality circle into the discussion process. It remains to be seen how far the revision will take into account technical and scientific necessities of the system and practical experiences of those who implement the law on a daily basis.
- A number of laboratories are already providing physicians with complementary information on notification of infectious diseases.
- In a pilot study with 44 representatively selected LHDs, mouse pads and information letters were distributed by fax to general practitioners. Preliminary analyses suggest that these measures have resulted in a significant increase of notifications [11;12].
- In January 2004, a completely revised new edition of case definitions was published by the RKI [13;14].
- RKI was actively involved in a federal initiative to foster

e-government (Bund online 2005) which provided a feasibility study on how to design a system for electronic laboratory notifications. This process has, however, recently come to a temporary stop, as resources to progress to the implementation stage are not available [15].

- RKI has released a simplified notification form, developed in cooperation with pilot LHDs and state health departments [12], which has generated a lively and positive response among state and local health departments.

The recommendations formulated in this quality circle have therefore already led to practical interventions and some of these have in turn had a measurable effect. This is a good indication that a quality circle, conducted in the above described manner, is an effective tool for quality improvement of public health surveillance systems.

### Acknowledgements

We would like to acknowledge the valuable contributions of all participants of the quality circle and we would also like to thank Inge Mücke and Irene Schöneberg for editorial support to this manuscript.

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