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Editorial

Evaluation of the notifiable diseases surveillance system in South Africa

In the battle against the scourge of infectious diseases, a robust system for disease surveillance is required. This is partly to provide early information when outbreaks threaten, so that they can be curtailed by intervention; and also to be able to monitor the effects of disease prevention and control measures. In addition, a good system of surveillance may be relied upon for resource allocation decisions and for targeting research into disease causation and control. Travellers (and those who give them medical advice) may have their own reasons to be interested in timeous and accurate surveillance information. It would also be useful to have a parallel system for surveillance of risk factors for infectious diseases (vectors, climate, social disturbances and so on).

Since infectious diseases may spread across international borders, health authorities also need to be well informed about the occurrence of infectious diseases outside their national borders. Good, robust, surveillance systems are of importance internationally as well as nationally.

It is therefore important that Departments of Health should evaluate the performance of their disease surveillance activities from time to time, in order to assess whether the system is fit for purpose and also whether there are shortcomings in data quality that need to be addressed.

For this reason, the paper "Comparing laboratory surveillance with the notifiable diseases surveillance system in South Africa" (Benson et al., 2017) is important, both for the southern African region as well as more widely. In this study the authors have compared the performance of the South African National Disease Surveillance System (NDSS) with the infectious disease laboratory data available from the National Health Laboratory Services (NHLS) during 2013. In South Africa, laboratories are not legally required to notify regarding infectious pathogens that they may identify from patient specimens, so the comparison is interesting. The authors of this paper carried out this comparison with reference to three locally important tracer diseases. These were measles, meningococcal meningitis and typhoid.

The authors used five parameter estimates in their comparison. These were Completeness, Stability, Representativeness, Sensitivity and Positive Predictive value (PPV). The last two parameter estimates were made using the laboratory data as the standard against which the notification data were evaluated.

Completeness, stability and representativeness were evaluated using the full data sets of all available information for the NDSS and the NHLS. However, for the sensitivity and PPV estimates a smaller data set, which included only those cases that could be matched between the notification data and the laboratory data, was used. In some cases, an inability to match records found in the two systems may not be due to the fact that the unmatched cases in the two data sets represent distinct actual cases of a disease. Sometimes there may have been incorrect or incomplete recording of names, and other identifying details, making definite matching difficult or even impossible. As a result, a sensitivity analysis was carried out in which unmatched notified cases were first assumed to be true laboratory positive cases and, secondly, assumed to be laboratory negative cases.

The results of this study indicate that, overall, the laboratory system performed better than the NDSS in terms of completeness, stability and representativeness. However, with regard to completeness (of information available in the records), the laboratory system was also sub-optimal (varying between 60% and 63%). Representativeness was assessed in terms of the proportion of South Africa's provinces that had reported within each system, with no weighting according to population size. Surprisingly, perhaps, up to five out of nine provinces had not provided any reports for one of the diseases, and the best disease for representativeness was for measles where three provinces did not provide information. The South African NDSS does not mandate zero reporting between levels of the healthcare system.

The results of the study by Benson et al. suggest that advantages may be gained by including laboratory results in the notification system. The laboratories (in both the private and public sectors) would then be required to notify all positive cases identified by them.

If it is assumed that all the unmatched cases in the two data sets represent additional, unique (genuinely distinct) cases, then it is apparent that of 173 measles cases positively identified by the NHLS only 54 were notified. For Meningococcal meningitis the numbers were 230 positive laboratory results with only 105 notifications received; and for Typhoid the figures were 64 and 18 respectively.

This is a worst case scenario since it is likely that at least some of the cases were unmatched, for example, due to different names being used for the same individual in the two data sets. Nevertheless, the inclusion of the NHLS cases would be expected to increase the number of notifications. In addition, the inclusion of private sector laboratory results (not reported on in this paper) might also be expected to add to the number of cases notified.

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Therefore it seems reasonable that both the clinicians and the laboratories should be required to notify regarding the diseases requiring notification, as is the case, for example, in many developed countries such as New Zealand (Annon, 2017), Ireland (Annon, 2001), North Carolina (Sickbert-Bennett et al., 2011) and Sweden (Jansson et al., 2005) and some less developed countries such as Sri Lanka (Chandrasekar, 2011).

Indeed, Benson et al. have recommended, in their article, that laboratories in South Africa should notify any positive results to the NDSS, and that legislation be changed to mandate such reporting.

If this is accomplished, it is not known how complete the accompanying notification data will be for the laboratory reports, especially if the laboratories have limited information about the patient from the requesting clinicians, as is often the case. Furthermore, some diseases, such as Meningococcal meningitis, may need to be notified immediately on suspicion, without waiting for laboratory confirmation. For these reasons, the laboratory notifications should be viewed as additional to the clinician notifications and not in the place of clinician-generated notifications. Hopefully the introduction of mandatory laboratory reporting will not lead to a degree of clinician abdication of reporting responsibilities. It may also be necessary to appoint and train a special category of confidential health worker to follow up on cases that are notified from the laboratory alone and that do not have certain vital information available (such as residential address for example).

Qualitative research that has been carried out in an effort to improve clinician participation in the notification system may need to be expanded to include such investigations for laboratories and also facilities (such as hospitals), although Benson et al. do not mention the possibility of requiring facilities to report as well.

A previous cross-sectional survey (Benson et al., 2016), using "Likert" type questionnaire items, has concluded that South African stakeholders awarded low scores for the South African NDSS in terms of acceptability, flexibility, simplicity, timeliness and usefulness. Laboratory and facilities managers were not surveyed in that study.

Qualitative research methods, such as key informant interviews and focus groups, may yield more useful outcomes when attempting to anticipate the desirable attributes of a changing system, as well as to help improve the likelihood of compliance.

In conclusion, Benson et al. present an interesting report, the first of its kind for South Africa. Their data lend support to the idea that, as has happened already in many other parts of the world, there is an advantage to be obtained from incorporating laboratory diagnostic data into the national disease surveillance system. However, clinician participation should be retained as well, and strengthened. Further qualitative research should be considered as an essential part of the process of enlargement of the notification reporting pool. This research should involve clinicians as well as the managers of laboratories (and possibly facilities management as well).

It will be interesting, too, to read published process and implementation reports for such efforts aimed at improving notification systems; for such sharing of experiences would be very useful for others who face similar challenges.

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