

From surveys to surveillance

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Surveillance of noncommunicable diseases (NCDs) has been neglected in modern epidemiology and public health. Silva et al. are to be congratulated for their willingness to work towards improving surveys as potential tools for surveillance purposes, as evidenced by their article on this subject last month in this journal (1) and by their follow-up case study in this issue (2). Such efforts are crucial in the context of the emerging NCD disease burden in developing or newly industrialized countries, which will have significant social and economic consequences for governments and health systems. Preventive programs are needed to halt the rapid rise in risk factor levels responsible for increasing disease burdens. Such preventive programs require information on the distribution of major risk factors in populations and regular, ongoing data collection to evaluate and refine interventions.

Surveillance has been defined as the systematic collection, analysis, and interpretation of health data and the timely dissemination of such data to policymakers and others. While this definition has been modeled on the body of science related specifically to surveillance of infectious diseases, it is equally relevant to surveillance of NCDs. In particular, surveillance provides the knowledge to support health promotion and disease prevention, and it should take place in the context of efforts to improve population health.

In contrast, surveys are often done only once, to determine the distribution of risk factors in a population at a point in time. In many developed countries, surveillance of major NCD risk factors is already quite advanced. Often an appropriate first step towards initiating surveillance is to conduct a baseline survey of sufficient sample size to have the power to detect meaningful changes over time. If well conducted, such a survey can provide important information for determining priorities for intervention, and for raising public and political awareness of the extent of public health problems. Nonetheless, a baseline survey is only the first step in what ideally should become an ongoing surveillance system that builds on multiple sources of health information.

The World Health Organization (WHO) is pursuing surveillance as part of a global strategy for preventing and controlling NCDs and the major risk factors that predict them. The WHO's "STEPwise" approach to surveillance for NCD risk factors is based on standardized data collection and a methodology that can be adapted to a variety of country settings. The STEPwise approach encourages the development of an increasingly comprehensive surveillance system that meets local needs. Moreover, for sustainable surveillance, the STEPwise approach emphasizes small amounts of good quality data over large amounts of poor quality data.

Unfortunately, all too many cross-sectional surveys employ different approaches, definitions, and methodologies. Silva et al. (1) question how useful many prevalence studies are for surveillance. The authors are frustrated by the continuing proliferation of studies that do not meet minimum criteria for providing useful information for decision-making. This concern has led the authors to a call for a uniform, standardized methodology that would allow comparisons between studies and over time.

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The tool constructed by Silva et al. (1) provides a guide for assessing the usefulness of prevalence studies for surveillance activities. This tool can also serve as a guide to planning future studies that aim to provide data for surveillance. The tool is logically constructed, with 19 questions (parameters) covering six well-defined areas: the study objectives, the population under study, the sampling design, the data collection methods, the analysis of data, and the communication of results. An affirmative answer is required for the first four parameters for a study to meet a minimum threshold of usefulness. These four requirements are: that the survey is population based, that the study has used probabilistic sampling, that the study has included a description of the sampling design, and that the study has presented the data by age and sex. We believe a welcome addition to the tool would be to require the use of standardized data collection methods.

Once the minimum threshold has been reached, the Silva et al. instrument (1) uses a scoring system to create an overall measure of the usefulness of any given survey for surveillance purposes, classifying the survey into one of three levels of usefulness. In order to demonstrate the process, Silva et al. use the example of hypertension. Their follow-up, companion paper (2) presents the results that the authors found when applying this tool to prevalence studies that included measures of blood pressure in the countries of Latin America and the Caribbean.

The assessment tool has some limitations. For example, many surveys were not established with the intention of repeated measures in the same population. Likewise, many of the items scored (e.g., training for those collecting the data, and the use of certified instruments) are difficult to ascertain and verify, even if mentioned in an article reporting on the study. It is also not clear how the final score precisely relates to the usefulness of a survey for surveillance purposes. As with any new tool, this approach needs to be validated, especially as the cut-off thresholds are derived by consensus.

A further concern with the suggested criteria relates to collection of data on hypertension. It could be argued that this approach focuses on treatment indicators, to the exclusion of a public health approach to risk factors. For example, the threshold that the medical field has for "high risk" blood pressure is arbitrary and subject to change as new evidence linking the level of a risk factor and the risk of disease and its treatment becomes available. Shifting the level at which indication for treatment is recommended complicates comparisons of reports written at different points in time or by groups using different definitions of "hypertension." Similarly, such definitions are difficult to compare between populations because people on treatment are included in the "hypertensive" group, regardless of blood pressure level. It also encourages a single risk factor approach at a time when the emphasis is shifting towards treatment decisions grounded in the context of overall levels of absolute risk. By contrast, as the authors point out, average systolic blood pressure and average diastolic blood pressure are simple, robust measures that are directly comparable, no matter when and where they were measured, assuming standard measurement protocols are used.

In deciding which data and how much data to collect, it is important to have a clear purpose for the planned use of the gathered information. Knowing which data *are* needed also helps in knowing which data *are not* needed. Each extra question adds to the costs of collection, storage, and analysis of information. It also adds to the burden on participants in the surveys and threatens levels of participation in future or follow-up surveys in the same population. The balance between the statistical precision required to produce useful information and the resources available to conduct the project is an im-

portant part of assessing how much data should be collected. A major challenge, not addressed in these two papers by Silva et al., is the complexity of surveys that attempt to measure a number of risk factors in an integrated fashion. In these cases, the balance between the sample sizes needed for statistical precision and the resources available to conduct the study depend on some baseline knowledge of risk factor prevalence in the study population. Studies that may not be rated as "useful" for surveillance by the Silva et al. tool may still provide these needed prevalence estimates.

Surveys should be built into a surveillance system that incorporates quality control measures for key survey components. For example, it is important to ensure that common questions are used by all participating locations, that data collection procedures are adhered to so that results will be valid, and that data are analyzed consistently across all participating locations. Participation in a global or regional network such as the WHO STEPwise approach to surveillance of the major NCD risk factors, which includes guidelines and training materials, will enhance standardized data collection and promote the development of country-based surveillance systems. More information on that approach is available from the WHO Web site, at www.who.int/ncd/surveillance.

The two Silva et al. papers were commissioned by the Program on Non-Communicable Diseases of the Division of Disease Prevention and Control of the Pan American Health Organization (PAHO), as a response to the technical needs that PAHO Member States had in the area of surveillance. The Silva et al. assessment tool will generate discussion and debate about the science of surveillance. Distinguishing between surveys in general and the use of surveys for surveillance purposes is a good place to begin these discussions. PAHO is to be congratulated for taking the initiative on this challenging project. We hope that this important work will be continued by PAHO and also by other regional organizations.

REFERENCES

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2. Orduñez P, Silva LC, Rodríguez P, Robles S. Prevalence estimates for hypertension in Latin American and the Caribbean: are they useful for surveillance? *Rev Panam Salud Publica* 2001;10(4):226-231.