

CAPACITY BUILDING FOR AN INTEGRATED NONCOMMUNICABLE DISEASE RISK FACTOR SURVEILLANCE SYSTEM IN DEVELOPING COUNTRIES

For the first time, the World Health Organization (WHO) is recommending that countries implement noncommunicable disease (NCD) surveillance by focusing on the major risk factors that predict the most common NCDs. To achieve this goal, member states are being offered a surveillance framework that provides a first step toward an integrated approach to NCD prevention and control. The goal of this framework, the STEPwise approach to NCD surveillance (STEPS), is to increase and sustain a country's capacity to ensure ongoing surveillance. Using the data to develop interventions and policies is an integral part of the STEPS approach, which, in turn, increases capacity to influence policy. Ongoing support from donors is essential to meeting the goal of increasing a country's capacity to undertake the NCD surveillance activity required to provide the basic information from which to formulate policy that effectively reduces the burden of disease. (*Ethn Dis.* 2003;13[suppl2]:S2-13-S2-18)

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INCREASING BURDEN OF NONCOMMUNICABLE DISEASE

Noncommunicable diseases (NCDs) are the leading cause of death and disability worldwide, with developing countries bearing a particularly heavy burden. In 2000, around 60% of all mortality, and 43% of the global disease burden, was due to coronary heart disease, stroke, cancers, and type 2 diabetes mellitus.¹ Among low- and middle-income countries, 79% of deaths, and 85% of the global disease burden, were due to the major NCDs. The major NCDs (heart disease, stroke, cancer, diabetes, and respiratory disease) are responsible for an increasing proportion of disease burden in many developing countries undergoing an epidemiological transition.² Even in developing countries with high mortality, 90% of deaths in 2000 were due to cardiovascular diseases, greater than the number those due to HIV/AIDS and childhood under-nutrition (Figure 1).

Increasing disease burden places a huge demand on health services, which, in most developing countries, are already over-extended. The major NCDs share at least one behavioral risk factor (eg, tobacco smoking, alcohol consumption, unhealthy diet, inadequate physical activity), and at least one physiological risk factor (eg, high blood pressure, overweight/obesity, high blood cholesterol, high blood glucose). The 12 leading risk factors in developing and developed countries reflect the increase in resultant NCD burden as the epidemiological transition continues (see Table 1).

The burden of disease attributable to the leading risk factors is presented in Figure 2. This figure demonstrates that

the burden from NCD risk factors is no longer a problem restricted to developed countries.¹ Mauritius provides an example of the increase in risk factors within a developing country. Between 1992 and 1998, the proportion of men with high blood pressure in Mauritius increased from 12% to 33%, with the proportion of women rising from 11% to 31% during the same time period.^{3,4} Taking action to control high blood pressure and other common risk factors is one way of slowing the alarming upward trend in NCD burden in developing countries.

THE WORLD HEALTH ORGANIZATION'S RESPONSE TO INCREASING NCD BURDEN

At the World Health Organization's (WHO) 53rd World Health Assembly held in 2000, a resolution on the prevention and control of noncommunicable diseases was passed to assist WHO member states in reducing the NCD burden. The resolution has 3 major components:

- To map emerging epidemics of NCDs (and their determinants) to inform policy, legislation and finance;
- To reduce the level of exposure of individuals and populations to the common NCD risk factors;
- To strengthen health care for people suffering a NCD.

Increasing the capacity of member states to undertake surveillance of NCD risk factors is a major initiative of the global strategy for the prevention and control of NCDs. The overall goal of the WHO global NCD surveillance strategy is to enable countries to build

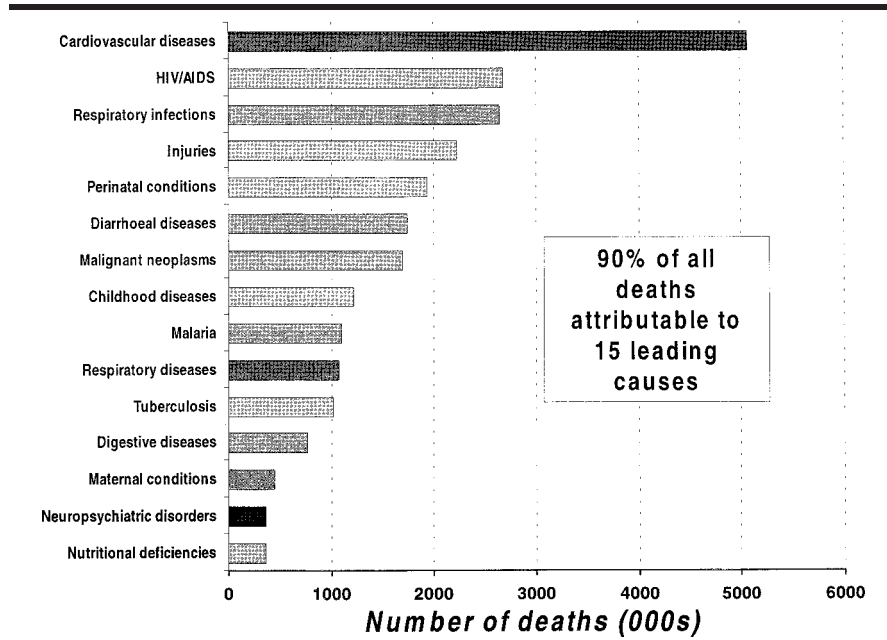


Fig 1. Leading causes of death in high mortality developing countries, 2000

and strengthen their capacity to conduct risk factor surveillance within the framework of an integrated, systematic approach aimed at a sustainable collection of data. Surveillance of the modifiable behavioral and biological risk factors for NCD, along with information describing the distribution of those factors among population subgroups, directly provides the data required for the first component stated above. Surveillance indirectly supports the reduction of exposure (component 2, as stated above) by providing the information necessary to inform, develop, and target policies toward reducing risks and improving health. Further, surveillance provides evidence (by allowing the assessment of

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trends over time) as to whether policies have been effective in reducing risks. Surveillance also provides the information required to estimate future health system needs, thereby indirectly supporting component 3, as stated above. Data collected is also used for comparisons by country and region.

The establishment of routine and ongoing risk factor surveillance as a dedicated entity within a Department or Ministry of Health, while ideal, may

only be possible for some countries. Population-based surveys undertaken on a periodic basis are more often perceived to be achievable. An integrated surveillance perspective requires collecting population-based data, as opposed to specifically focusing on one particular high-risk group. This approach assumes that data collected are directly relevant and important to the public health field, and that an infrastructure for conducting surveillance can be developed, maintained, and expanded over time. This ensures that ad hoc resource intensive and one-time-only surveys, which employ a variety of methods, are replaced by an integrated system for surveillance that can provide useful information to policymakers.⁵

In some countries, surveillance of NCD risk factors is already under way. For countries just beginning to implement programs of health promotion and disease prevention, an appropriate first step toward initiating surveillance is to conduct a 'baseline' survey with a sample of sufficient size to have the power to detect changes over time. This survey should also provide information important for determining the priorities for interventions, and for raising public and political awareness concerning the likely extent of the problem. Nonetheless, a baseline survey is only the first step in

Table 1. Leading 12 risk factors as causes of burden of disease in developing and developed countries-2000

Developing Countries			Developed Countries
High Mortality	Low Mortality		
1 Underweight	Alcohol		Tobacco
2 Unsafe sex	Blood pressure		Blood pressure
3 Unsafe water	Tobacco		Alcohol
4 Indoor smoke	Underweight		Cholesterol
5 Zinc deficiency	Body mass index		Body mass index
6 Iron deficiency	Cholesterol		Low fruit & veg intake
7 Vitamin A deficiency	Low fruit & veg intake		Physical inactivity
8 Blood pressure	Indoor smoke—solid fuels		Illicit drugs
9 Tobacco	Iron deficiency		Unsafe sex
10 Cholesterol	Unsafe water		Iron deficiency
11 Alcohol	Unsafe sex		Lead exposure
12 Low fruit & veg intake	Lead exposure		Childhood sexual abuse

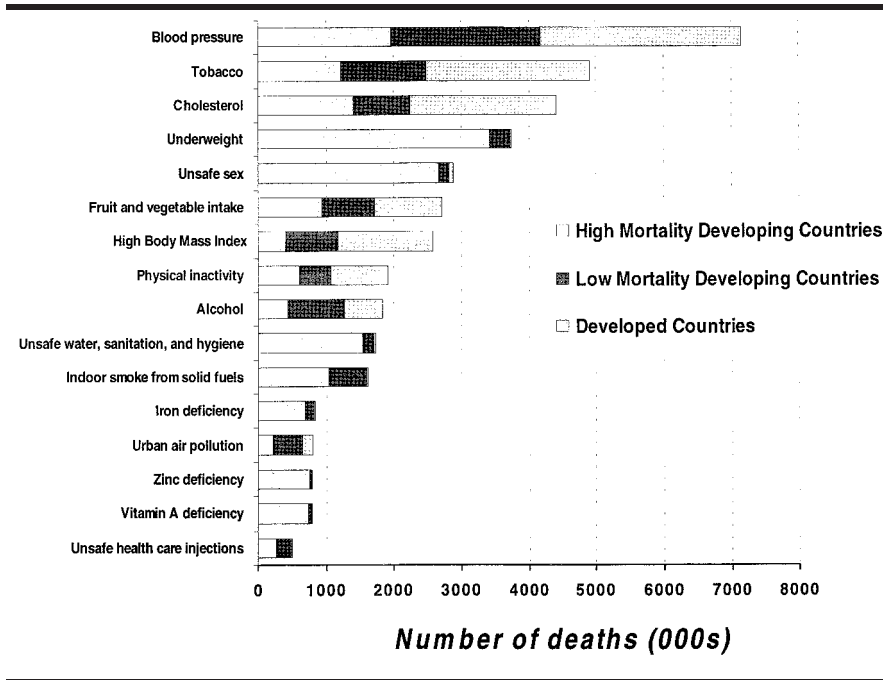


Fig 2. Burden of disease attributable to selected risk factors, 2000

what must become an ongoing surveillance system.

THE WHO NCD GLOBAL SURVEILLANCE STRATEGY

In developing a global surveillance strategy, initially directed at low- and middle-income countries, WHO adopted the following principles and approaches: 1) the identification of the key risk factors to be addressed, together with standardized definitions; 2) the development of a coordinated approach for conducting surveillance of risk factors that upholds scientific principles and is sufficiently flexible to meet local and regional needs; 3) the provision of technical materials and tools, including training, to support the implementation of the surveillance tools; 4) effective communication strategies for providing data to planners of policy and intervention programs, decision-makers, potential funding sources, and the general public; and 5) the use of accessible technology to share information within and between countries.

The rationale for including key risk factors as the basis of an NCD surveillance system is based on the evidence that: 1) they have the greatest impact on NCD morbidity and mortality; 2) they meet accepted epidemiological criteria of causation; and 3) they can be modified, thus reducing risk for NCDs. In this sense, the risk factors of today predict the diseases of tomorrow. Not only do the major NCDs share common risk factors, many behavioral risk factors tend to appear in 'clusters' among in-

dividuals (eg, physical inactivity, poor diet, and smoking), which, in turn, influence a 'clustering' of biological risk factors (eg, obesity and high blood pressure). The most common NCDs, and the related risk factors that meet criteria for inclusion in the WHO NCD global surveillance strategy, are shown in Table 2.

WHO STEPWISE APPROACH TO NCD SURVEILLANCE (STEPS): A FRAMEWORK

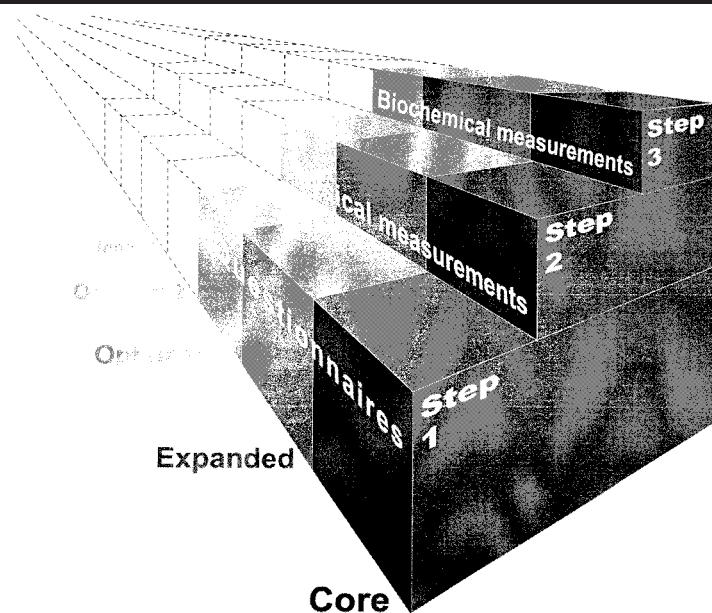
The WHO STEPwise approach to surveillance (STEPS) is the recommended NCD surveillance tool.⁶ This framework unifies all WHO approaches to defining core variables for population-based surveys, surveillance, and monitoring instruments for NCDs. The goal is to increase a country's capacity to achieve data comparability over time, and between countries. The WHO STEPwise approach to surveillance (STEPS) offers an entry point for low- and middle-income countries to begin NCD activities. The WHO STEPwise approach to surveillance (STEPS) for NCD risk factors is based on the concept that surveillance systems require standardized data collection, as well as sufficient flexibility, in order to be appropriate in a variety of country situations and settings (Figure 3). The

Table 2. Risk factors common to major noncommunicable diseases

Risk Factor	Condition			
	Cardio-vascular*	Diabetes	Cancer	Respiratory†
Smoking	v	v	v	v
Alcohol	v		v	
Diet	v	v	v	v
Physical inactivity	v	v	v	
Obesity	v	v	v	v
Raised blood pressure	v	v		
Blood glucose	v	v	v	
Blood lipids	v	v		

* Including coronary heart disease and stroke.

† Including chronic-obstructive pulmonary disease and asthma.



INCREASING REGIONAL AND COUNTRY CAPACITY FOR INTEGRATED NCD RISK FACTOR SURVEILLANCE

The ultimate goal of the WHO STEPS approach is to increase a country's capacity to develop a sustainable infrastructure for NCD surveillance. To achieve this goal, strategic alliances are necessary at the global, regional, and country level.

World Health Organization (WHO) Geneva provides global coordination for implementing STEPS across the WHO regions. WHO Geneva, in collaboration with the WHO regional offices, provides STEPS training to STEPS focal points by region and country, and other STEPS team members. The WHO STEPwise approach to STEPS training is a 'train the trainer' approach, which ensures that knowledge and capacity is improved and maintained within the region and country. Training covers all aspects of the planning, implementation, data collection, analysis, and dissemination of the results of a STEPS survey in the context of an integrated surveillance system. Access to ongoing technical advice and support is provided by WHO Geneva to assist in implementation efforts.

Although WHO Geneva coordinates WHO STEPS, WHO regional offices implement the programs within countries. Regional networks of NCD prevention and control champion activities aimed at minimizing the burden of NCDs through developing and strengthening integrated NCD programs, including associated surveillance. These networks exist, or are being formed, in the South East Asia Region (SEAR), among the island nations of the Western Pacific (WPR), in the Eastern Mediterranean Region (EMR), and in the African Region (AFR). The Americas and Europe have well established networks (the Conjunto de Acciones para Reduccion Multifactorial de

Fig 3. WHO STEPS: risk factors framework

STEPwise approach, therefore, allows for the development of an increasingly comprehensive and complex surveillance system based on local needs and resources.

The STEPwise approach advocates that small amounts of good quality data are more valuable than large amounts of poor quality data. A strong argument can also be made for the benefits of monitoring a few modifiable NCD risk factors, since they reflect a large part of future NCD burden, and indicate the potential success of interventions considered to be beneficial in reducing various NCDs.

In the STEPS approach, the recommended surveillance measures are categorized according to the degree of complexity and cost in obtaining the data. The degree of difficulty equates to whether questionnaires alone are used, physical measures are collected in the field, or blood collections/analysis are undertaken.

The key feature of the STEPS framework is the distinction between different levels of risk factor assessment. Self-reported behavioral information is collected by questionnaire (step 1),

blood pressure and anthropometric information are obtained by objective measures (step 2), and objective information determined from blood samples for biochemical analyses (step 3). Within each step, core, expanded, and optional information can be collected. At a minimum, core information provides the basic, comparable variables to describe prevalence and trends in the most common risk factors. Expanded modules provide more detailed, though still standardized, information on the major risk factors. Optional modules can be added to provide data on risk factors not included in the standard STEPS approach, to obtain country- or culturally specific information, or to assess program evaluation (for example, public awareness of a specific campaign).

The WHO STEPS approach follows a sequential process. The key premise is that, by using the same standardized questions and protocols, all countries can use the information, for informing both within-country trends, and between-country comparisons. Therefore, the questionnaires and methods recommended are relatively simple.

Enfermedades [CARMEN] in the Americas and the Countrywide Integrated Noncommunicable Disease Intervention [CINDI] in Europe [EUR]) that promote surveillance activity in order to provide information to assist in the reduction of NCDs. The recent Global Forum on NCD Prevention and Control, held in Shanghai, November 2002, passed the recommendation that the WHO STEPS approach should be the entry point for NCD surveillance, and should be incorporated into national surveillance systems.

ESTABLISHING TECHNICAL SUPPORT AND COORDINATION AT REGIONAL AND COUNTRY LEVEL

In order to provide overall guidance to the planning and implementation of STEPS in select countries, WHO delivers and funds STEPS training workshops in those countries. Initially, training is delivered in collaboration with faculty from WHO Geneva. However as the country's surveillance capacity is increased, training can be delivered by regional staff, with support from WHO collaborating centers. Partnerships with appropriate governmental and non-governmental agencies ensure the long term goal of ongoing surveillance in the region.

Each country of a WHO member state implementing STEPS is advised to convene a group or a committee, which works as the equivalent of a National Inter-agency Coordinating Committee. This committee oversees the practical and logistic issues relating to the overall country level implementation of STEPS, as well as providing assistance in translating the data into policy and programs.

The national committee works with a national STEPS coordinator to develop a strategic plan of action to address the immediate needs for baseline sur-

veillance activity, while being mindful of both the intended use of the surveillance information gathered (ie, prevention, health promotion, and policy development), and the long-term need to monitor and evaluate changes over time. Access to technical assistance from outside institutions (eg, to assist with sampling issues, study methodology, training, etc.) is available to support the committee with the planning and implementation of the STEPS survey.

Training to increase regions' and countries' capacity to undertake NCD risk factor surveillance has been implemented in 4 regions (WPR, AFR, SEAR, EMR), for representatives of more than 30 countries. In the African Region, a planning workshop was held in Capetown, South Africa, in April 2002, and was attended by participants from 9 African countries (Algeria, Côte d'Ivoire, Ethiopia, Ghana, Mozambique, Nigeria, Senegal, South Africa, and Zimbabwe). A key feature of this workshop was the attendance of country disease prevention officers who traditionally focused their attention on communicable diseases. Up to 50 people are involved in the planning and implementation of a baseline survey. Further training will be carried out during 2003 in those regions, providing a solid coverage of trained personnel to assist in the implementation of surveillance activities. Further, to initiate implementation of the STEPS approach, data collection has begun, or is scheduled to begin soon, in approximately half those countries that have received training and identified sources of funding.

BUILDING ON EXISTING SYSTEMS

The WHO STEPwise approach also is designed to add to existing surveillance infrastructure, and to further increase local capacity for surveillance already in place. For example, WHO works with the field sites providing data

to the International Network of field sites with continuous Demographic Evaluation of Populations and Their Health (INDEPTH)⁷ in Ethiopia, South Africa, Indonesia, and Vietnam. One outcome of this collaboration is the provision of field experience and training for postgraduate students. Similarly, the STEPS approach and methodology lends itself to support training and capacity building in other networks, such as the Training in Epidemiology Programs and Public Health Interventions Network (TEPHINET). The core risk factors at Step 1 (smoking and alcohol use, fruit and vegetable consumption, and physical inactivity) have been incorporated into the World Health Survey,^{8,9} which is currently being undertaken in 72 countries.

INFORMATION FOR ACTION

An integral component of the STEPS approach is to provide policymakers with data useful to the development of public health interventions. The collection and analysis of good quality data on NCDs is not enough to inform policy in an environment in which the health agenda is subject to competing priorities. Therefore, it is necessary to further provide policymakers with accurate, useful, and easily interpreted distillations of results.¹⁰ The STEPS approach was designed with this fact in mind, and countries are assisted in preparing NCD surveillance reports designed to capture the attention of public health policymakers. The success of ongoing surveillance in developing countries depends on the commitment of governments and other donor organizations.

SUMMARY

For the first time, WHO is recommending that countries implement NCD surveillance by initially focusing

To achieve this goal, member states are being offered a surveillance framework which provides a first step toward an integrated approach to NCD prevention and control.

on a few major risk factors that predict the main NCD diseases. To achieve this goal, member states are being offered a surveillance framework which provides a first step toward an integrated approach to NCD prevention and control. This framework has the goal of increasing the capacity of regions and countries to ensure program sustainability. The use of the data in developing interventions and policies is an integral part of the STEPS approach, which, in turn, increases capacity to influence policy. Ongoing donor support is essential to meeting the goal of increasing a country's capacity to undertake the NCD surveillance activity that provides the basic information from which to formulate policy that effectively reduces the burden of disease.

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