

A COMPREHENSIVE GLOBAL MONITORING FRAMEWORK AND VOLUNTARY GLOBAL TARGETS FOR THE PREVENTION AND CONTROL OF NCDs

Introduction

Noncommunicable diseases (NCDs) are currently the leading global cause of death worldwide. Of the 57 million deaths that occurred globally in 2008, 36 million deaths - almost two thirds- were due to NCDs, comprising mainly cardiovascular diseases, cancers, diabetes and chronic lung diseases (1). The combined burden of these diseases is rising fastest among lower income countries. About one fourth of global NCD-related deaths take place before the age of 60 (2).

A large proportion of NCDs are preventable. These NCDs share modifiable behavioural risk factors like tobacco use, unhealthy diet, lack of physical activity, and the harmful use of alcohol, which, in turn, lead to overweight and obesity, raised blood pressure, and raised cholesterol. The cost of doing nothing over the next three decades amounts to trillions of dollars of lost resources (3). Feasible and cost-effective interventions exist to reduce the burden and impact of NCDs and sustained action to prevent risk factors and improve health care can avert millions of preventable premature deaths (4).

The global strategy for the prevention and control of NCDs (5) has three key components: surveillance, prevention, and health care. Surveillance aims to monitor NCDs and to analyse their social, economic, behavioural and political determinants in order to provide guidance for policy, legislative and financial measures.

The importance of surveillance and monitoring has been emphasized during the High-level Meeting (HLM) of the United Nations General Assembly on the Prevention and Control of NCDs, held from 19-20 September 2011 in New York. The Political Declaration of the HLM (6), adopted by the General Assembly on 19 September 2011 (resolution 66/2), calls on WHO to develop, before the end of 2012:

- i. a comprehensive global monitoring framework to monitor trends and to assess progress made in the implementation of national strategies and plans on NCDs;

- ii. recommendations for a set of voluntary global targets for the prevention and control of NCDs.

According to the Political Declaration, the global monitoring framework and the recommended set of voluntary global targets should be developed with the participation of Member States and in collaboration with United Nations agencies, funds and programmes, and relevant international organizations. It will build on existing WHO work and should be applicable across regional and country settings. The framework and the set of voluntary targets should be developed through the WHO Governing Bodies in 2012.

This paper puts forward a comprehensive monitoring framework which encompasses a country and global component. The framework is underpinned by a set of general principles, which are building upon the experiences gained with the monitoring of other global initiatives for health and development, such as the Millennium Development Goals (MDGs) and the United Nations General Assembly Special Session (UNGASS) on HIV/AIDS.

The development of the global monitoring framework and voluntary global targets is based on a consultative process, building on the position on NCD surveillance described in the WHO Global Status Report on NCDs 2010. In January 2011, WHO established a technical working group to advise on the development of NCD targets and indicators. In July 2011, WHO released a document outlining a preliminary set of proposed global targets and indicators for review via a web-based consultation. Building on extensive comments received from Member States, work continued in a more intensive way, after the High-level Meeting, to prepare a more detailed background paper to facilitate further consultation with Member States. In early December 2011, WHO consulted with other UN funds, programmes and agencies and conducted an informal dialogue with relevant NGOs, as a component of this ongoing process. The paper will be discussed during an informal consultation with Member States and UN agencies which WHO will convene between 9-10 January 2012. The views of Member States and the outcome of the informal consultation in January 2012 will guide the development of draft recommendations on the global monitoring framework and voluntary targets for submission to the governing bodies of WHO.

../..

Part one: Monitoring NCDs at the country level

NCD surveillance is the ongoing systematic collection and analysis of data to provide appropriate information regarding a country's NCD disease burden, the population groups at risk, estimates of NCD mortality, morbidity, risk factors and determinants, coupled with the ability to track health outcomes and risk factor trends over time. Surveillance is critical to providing the information needed for policy and programme development and to support the monitoring and evaluation of the progress made in implementing policies and programmes.

Countries need accurate data to respond effectively to the rise in death and disability from NCDs. Currently, many countries have little usable mortality data and weak NCD surveillance. Improving country-level surveillance and monitoring must be a top priority in the fight against NCDs¹.

A monitoring framework should be broad and include the main elements of accountability, which can be defined as a cyclical process of monitoring, review and action.² This cyclical process is relevant at the country level, with data collection and analysis to monitor progress, feeding the results into broad based country-led reviews with participation of all relevant stakeholders, and translating the review conclusions into improved operational plans. This process should be part and parcel of national health strategies. The country-review process provides the data for a similar global process of monitoring - which not only includes country data, but also data on resource flows, global review processes, independent reviews, etc, through UN entities - and action.

Table 1 provides a framework for a national NCD surveillance scheme. The three major components of NCD surveillance are: a) monitoring exposures (risk factors); b) monitoring outcomes (morbidity and disease-specific mortality); and c) assessing health system capacity and response, which also includes national capacity to prevent NCDs, in terms of policies and plans, infrastructure, human resources and access to essential health care including medicines. A list of examples of core indicators on exposures and outcomes is provided in the WHO Global Status Report on NCDs 2010 (2).

¹ The WHO 2008–2013 Action Plan for the Global Strategy for the Prevention and Control of Noncommunicable Diseases recommends critical actions for Member States to strengthen surveillance and standardize data collection on NCD risk factors, disease incidence and cause-specific mortality. The plan also calls on Member States to contribute, on a routine basis, data and information on trends related to NCDs and their risk factors stratified by age, sex and socioeconomic group, and to provide information on progress made in implementation of national strategies and plans.

² Commission on Information and Accountability for Women's and Children's Health. Keeping promises, measuring results. WHO, Geneva. 2011.

Table 1: Framework for national NCD surveillance

Exposures

- Behavioural risk factors: tobacco use, physical inactivity, the harmful use of alcohol and unhealthy diet.
- Physiological and metabolic risk factors: raised blood pressure, overweight/obesity, raised blood glucose, and raised cholesterol.
- Social determinants: like educational level, household income, access to health care.

Outcomes

- Mortality: NCD-specific mortality.
- Morbidity: Cancer incidence and type (as core).

Health system response

- Interventions and health system capacity: infrastructure, policies and plans, access to key health-care interventions and treatments, partnerships.

Source: WHO Global Status Report on Noncommunicable Diseases 2010.

Before describing the components of the NCD surveillance framework, a set of common principles needs to be defined:

1. Capacity for surveillance: the existence of country capacity to collect, compile, analyse and communicate NCD surveillance data is critical. Institutional capacity strengthening should be an integral part of NCD surveillance, as a vital public health function. A significant increase in financial and technical support is necessary for health information system development in low- and middle-income countries if global health priorities and goals are to be achieved.
2. Alignment with the country health information system: NCD surveillance should be integrated into the national health information system, including causes of death, household and facility surveys and facility reporting systems.
3. Linking with country reviews/accountability processes: NCD surveillance should be a significant component of the monitoring of the implementation of national health and development strategies. It should be discussed at regular reviews, such as annual health sector reviews and common platforms such as the International Health Partnership will be used as much as possible. NCD specific progress reviews may be considered, but should be fully aligned with the country's system of monitoring the national health strategy.
4. Indicators: the surveillance system should be based on global standards for the measurement of common indicators and targets, adapted to meet the country specific issues and needs.

5. Equity: monitoring progress should cover key social determinants and equity. The key indicators will have to be broken down by gender, age group, socio-economic position, key social determinants like education, and other relevant country-specific stratifiers.

Monitoring exposures

Monitoring of risk factors should be the mainstay of national NCD surveillance in most countries. Data on behavioural and metabolic risk factors are typically obtained from national health interview or health examination surveys, either addressing a specific topic (e.g. tobacco) or multiple factors. Data on social determinants, which can then be used to further understand risk factor patterns, are also typically obtained from these sources.

Given the major public health significance of NCDs and their risk factors, each country should have at least one health examination survey, including interview and biological and clinical data collection, every five years. In this context, the WHO STEPs survey approach to NCD risk factor surveillance is a good example of an integrated and phased approach that has been used and tested by many countries. It allows countries to develop a comprehensive risk profile of their national populations.

The WHO Global Status Report 2010 provides comparable estimates on the 2008 status of the main risk factors (behavioural and physiological/metabolic) (2). It also identifies countries and areas where gaps in data need to be addressed.

Monitoring outcomes: mortality and morbidity

An accurate measure of adult mortality is one of the most informative ways to measure the extent of the NCD epidemic and to plan and target effective programmes for NCD control. All-cause and cause-specific death rates, particularly deaths before age 60 or 70, are key NCD indicators. High-quality mortality data can only be generated by long-term investment in civil registration and vital statistics systems.

Only a third of the global population lives in an area where more than 90 per cent of births and deaths are registered. Two-thirds of the world's population (85 countries) had inadequate cause of death data or lacked such data altogether. There are some encouraging signs of increased awareness of the need for better vital statistics among decision-makers and use of information technology holds the promise of overcoming some persistent obstacles. Strengthening NCD surveillance should link with and strengthen those efforts. National initiatives to strengthen vital registration systems, and cause-specific mortality statistics, are a key priority. This should include strengthening cause of death certification and coding using the International Classification of Diseases, as well as the use of interim measures such as verbal autopsy.

Accurate information on morbidity, e.g. cancer and diabetes, is important for policy and programme development. This is particularly the case for cancer where data

on the incidence and type of cancer are essential for planning cancer control programmes. The diversity of cancer types in different countries highlights the need for cancer control activities to fully consider cancer patterns and available resources, given that different cancers may be variably amenable to primary prevention, early detection, screening and treatment. In lower-resource settings, hospital-based registries can be an important step towards the establishment of population-based cancer registries (PBCR), but it is only the latter that provide an unbiased description of the cancer patterns and trends in defined catchment populations. Despite their overwhelming need, there remains a notable lack of high-quality PBCRs in Africa, Asia and Latin America.

Monitoring health system response and country capacity

The monitoring of the health system response and country capacity includes a number of input, output and coverage indicators. National systems of health accounts should aim to include, as much as possible, tracking of resources for NCD prevention and control. Monitoring infrastructure and human resource capacity is essential. The monitoring should also aim to cover the response in other sectors, as prevention requires a multisectoral approach. The availability and affordability of basic diagnostics and essential medicines requires good facility data, while the monitoring of access to and coverage of case detection and treatment measures is often done through household surveys. Assessing individual country capacity and health-system responses to address NCDs, and measuring their progress over time, are major components of the reporting requirements stated in Objective 6 of the Global Strategy Action Plan. The use of such data in country health review processes is critical.

../..

Part two: Implications for global monitoring of NCDs

In the Political Declaration, Heads of State and Governments recognize the primary role and responsibility of governments in responding to the challenge of NCDs. The Political Declaration calls for implementing the global strategy for the prevention and control of NCDs of which monitoring is one of three basic components. At the same time, the Political Declaration stresses the important role of the international community and international cooperation in supporting and monitoring global action against NCDs.

Any global monitoring framework should represent consensus among Member States on the purpose, methods, roles and responsibilities. There should also be agreement on a set of time-bound targets that cover one or more of the framework's key components. The NCD monitoring framework and its indicators will provide an important platform for political support to integrate NCDs into national health and development planning and monitoring processes.

It is crucial that global monitoring is closely linked with national goals and targets and serve to strengthen the coherence and implementation of national policies and programmes.

Objectives of global monitoring

Similar to the situation at the country level, monitoring is an essential component of the global agenda of action to address NCDs and their impact on health and development. It provides a tool to plan, monitor trends and assess the progress countries are making.

Global monitoring also serves to raise awareness and reinforce political commitment for a stronger and coordinated global action involving all key stakeholders. Global standards are attractive to countries and the international development community and can be an effective tool for advocacy and resource mobilization. They can serve as incentives for progress in attaining the desired targets.

The framework also provides internationally comparable assessments of the status of NCD trends over time, and helps to benchmark the situation in individual countries against others in the same region or same development category. It identifies areas where strengthened action and more support is needed. Major gaps in data and capacity that need to be addressed through coordinated global support will be clearly recognized.

Key elements of a sustainable global monitoring framework

The monitoring framework should be based on a long-term global vision and a concrete plan which in the case of NCDs are represented by the global strategy, its action plan and the Political Declaration.. Strong ownership and commitment of countries is an essential element of an effective and sustainable system.

Reaching consensus on an appropriate and limited set of targets and indicators is always a dilemma, specially in the NCD area where there are diverse aspects that require tracking. Selection of targets should therefore take into account a careful assessment of what is realistically possible to monitor and where there is a more weight and greater value in measuring the desired changes in behaviours or outcomes. Countries will be asked to report on the tracer indicators, even though local adaptations of targets may be needed, based on the specific country situation.

As with national monitoring and evaluation systems, emphasis on equity issues is key. Measuring and addressing inequities is central to the global struggle against NCDs and is often at the heart of political debate. Any global monitoring framework should aim to set targets and indicators that aim to reduce inequities and take the key social determinants into account. The global reporting system should give ample attention to disaggregated data for the tracer indicators to be able to ascertain trends in inequality.

International collaboration in strengthening the capacity of low- and middle-income countries in data collection, analysis, and reporting is an important element of a global monitoring framework.

High-level political commitment and cooperation between governments and various parts of the UN system will be needed. The international development community will be expected to provide technical support to help countries in reinforcing surveillance and monitoring functions.

Experience from past and current global monitoring schemes

The monitoring of progress of past and current UN health and other initiatives, such as the MDGs and the UNGASS declaration on HIV/AIDS, shows that the most successful models use a parsimonious set of indicators and are focused on health outcomes and impact. Target setting is an important component, although targets with very short timelines were not successful. The more successful global monitoring efforts have been accompanied by investments to address critical data gaps in low and middle income countries.

All major global initiatives report to a United Nations agency or the General Assembly, and are mostly supported with some kind of interagency expert review mechanisms at global level. These mechanisms often involve technical experts from academic and research institutions from around the world.

While the focus of the Millennium Development Goals (MDGs) is in practice mostly on the developing countries, a monitoring framework for NCDs is a universal need and is essential for countries at different stages of development.

What to monitor in a global monitoring scheme

A comprehensive global monitoring system will be based on the framework for national NCD monitoring. Key elements are exposures (risk factors and social

determinants), outcomes (mortality and morbidity), and health system capacity and response with emphasis on the priorities included in the Political Declaration.

In developing targets for inclusion in a global monitoring framework, adherence to the following criteria should be assessed:

- High epidemiological and public health relevance
- Coherence with major strategies
 - priorities of the Global Strategy for the Prevention and Control of Noncommunicable Diseases and its Action Plan, as well the Political Declaration.
 - WHO framework for health systems priorities to monitor exposures, outcomes, and health systems response
- Evidence driven targets and indicators
 - Availability of evidence-based effective and feasible public health interventions
 - Evidence of achievability at the country level
- Existence of unambiguous data collection instruments and potential to set a baseline and monitor changes over time.

These criteria were seriously considered in developing the examples of potential targets and indicators which are included in Part three of this paper.

Governance, Secretariat, and tools

Based on the Political Declaration, the World Health Assembly is the governing body with an established mandate and responsibility for global monitoring. However, the progress of monitoring may potentially be reviewed in future discussions on NCDs at the level of the United Nations General Assembly and in related monitoring processes within the United Nations System³.

WHO provides the Secretariat for the global monitoring scheme. An interagency group, advised by an independent technical advisory group, will be established and the group will play a key role in assessing progress. A full report of progress will be produced during each global monitoring round and data will be disseminated through the Global Health Observatory and periodic WHO Global Status Reports on NCDs.

../..

³ The Political Declaration requests the United Nations Secretary-General, in collaboration with Member States, WHO and other UN agencies to present to the United Nations General Assembly, at the sixty-eighth session, a report on the progress achieved in realizing the commitments made in the Political Declaration, in preparation for a comprehensive review and assessment in 2014 of the progress achieved in the prevention and control of noncommunicable diseases.

Part three: Recommendations for a set of voluntary global targets and indicators

Table 2 provides the basis for discussion on the development of a set of voluntary global targets and tracer indicators. The inclusion of the targets and indicators was based on scientific review of the current situation and trends, and critical assessment of feasibility. Their selection as key examples was guided by a number of key criteria mentioned earlier in Part two, namely public health relevance, coherence with existing strategies, evidence-base of interventions, and feasibility of data collection and achievements of targets. Targets should be relevant to the global burden of NCDs, and attainable. Achievement of these targets by 2025 should represent major progress in reducing NCDs and their risk factors.

Indicators must be measurable, and have feasible monitoring mechanisms available. Selection considered the existence of evidence-based interventions, practical for implementation, including in low- and middle-income countries.

A "target" represents the specific goal to be achieved by 2025. The baseline to be used for all targets is 2010. Age-standardized baselines for 2010 for all targets will be established by WHO, based on existing available data and estimation methods to fill data gaps, such as those described in the WHO Global Status Report 2010. Interim targets for 2015 and 2020 will be set at a later date for all indicators. The "indicator" is used to assess progress and achievement of the target. The "data source" describes the origins of information for the indicator.

The total number of targets and indicators presented in this paper has been limited to carefully selected key areas of the NCD surveillance framework. This limited number is thought to provide a foundation for global surveillance needs with special emphasis on ensuring feasibility of application across regional and country settings. Member States, however, may choose to consider expanding upon the core set to assure coverage of geographic priorities and key sub-population monitoring.

Prevalence targets are age-standardized to discount any effect on prevalence based on different age distributions across populations and over time, and future reporting against all indicators will be age-standardized. Without this standardization it would be unclear if differences in rates or prevalence were due to age or other factors.

Table 2: A preliminary set of proposed global targets and indicators for review

Outcome targets	Indicator	Data Source(s)	Has Strongest Adherence to all criteria*
1 Mortality from NCDs 25% relative reduction in overall mortality from cardiovascular disease ⁴ , cancer, diabetes, or chronic respiratory disease	Unconditional probability of dying between ages 30-70 from, cardiovascular disease, cancer, diabetes, or chronic respiratory disease	Civil registration system, with medical certification of cause of death, or survey with verbal autopsy	*
2 Diabetes 10% relative reduction in prevalence of diabetes ⁵	Age-standardized prevalence of diabetes among persons aged 25+ years	National survey (with measurement)	
Exposure targets			
3 Tobacco smoking 40% relative reduction in prevalence of current tobacco smoking	Age-standardized prevalence of current tobacco smoking among persons aged 15+ years ⁶	National survey	*
4 Alcohol 10% relative reduction in persons aged 15+ alcohol per capita consumption (APC)	Per capita consumption of litres of pure alcohol among persons aged 15+ years	Official statistics and reporting systems for production, import, export, and sales or taxation data; and national survey	*
5 Dietary salt⁷ intake Mean population intake of salt less than 5 grams per day	Age-standardized mean population intake of salt per day	National survey (with measurement)	*

⁴ Cardiovascular disease includes coronary heart disease (heart attack), cerebrovascular disease (stroke), peripheral artery disease, rheumatic heart disease, congenital heart disease and heart failure

⁵ Diabetes is defined as fasting plasma glucose ≥ 7.0 mmol/L (126, g/dl) or on treatment for diabetes

⁶ Achieved through full implementation of the WHO Framework Convention on Tobacco Control (WHO FCTC), and in particular demand reduction measures

⁷ For the purpose of this target, the term salt refers to sodium chloride and 5 grams of salt is approximately 2g of sodium

	Exposure targets	Indicator	Data Source(s)	Has Strongest Adherence to all criteria*
6	Blood pressure/Hypertension 25% relative reduction in prevalence of raised blood pressure ⁸	Age-standardized prevalence of raised blood pressure among persons aged 25+ years	National survey (with measurement)	*
7	Obesity No increase in obesity ⁹ prevalence	Age-standardized prevalence of obesity among persons aged 25+ years;	National survey (with measurement)	
8	Prevention of heart attack and stroke 80% coverage of multidrug therapy (including glycaemic control) for people aged 30+ years with a 10 year risk of heart attack or stroke \geq 30%, or existing cardiovascular disease	Percentage of estimated people aged 30+ years with a 10 year risk of heart attack or stroke \geq 30%, or existing cardiovascular disease who are currently on multiple drug therapy (including glycaemic control).	National survey (with measurement)	
9	Cervical cancer screening 80% of women between ages 30-49 screened for cervical cancer at least once	Prevalence of women between ages 30-49 screened for cervical cancer at least once	National survey; health facility data	
10	Elimination of industrially produced trans-fats from the food supply Elimination of industrially produced trans-fats (PHVO) from the food supply	Adoption of national policies that eliminate partially hydrogenated vegetable oils (PHVO) in the food supply	Policy review	*

* Relevance, Coherence, Interventions, Achievability, and Measurability

⁸ Raised blood pressure is defined as systolic blood pressure \geq 140 and/or diastolic blood pressure \geq 90

⁹ Obesity is defined as Body Mass Index (BMI) equal or greater than 30kg/m²

Measurement needs

It is proposed that global assessment of the progress in terms of exposure and health outcome indicators is conducted every five years (2015, 2020), using the 2010 data as the baseline.

To monitor progress, a robust monitoring system is needed. Not all countries have available the spectrum or quality of surveillance resources needed to monitor NCD reduction efforts fully. The global, regional, and national community must explore means to increase national capacity for the development of appropriate surveillance systems as a core public health function. For this reason, we do not recommend lower quality substitute methods for measuring progress.

Main components of the surveillance system required for monitoring progress towards the targets and indicators include:

- *Death registration, with a reliable cause of death*
High-quality mortality data can best be generated by long-term investment in civil registration. Recording all deaths and their cause on a country level is a critical requirement. Accurate reporting of the cause-of-death on the death certificate is a challenge, even in high-income countries. Only about two thirds of countries have vital registration systems that capture the total number of deaths reasonably well. Although total all-cause mortality may be reported reasonably well, accuracy problems exist for cause-specific certification and coding in a large number of countries. In these countries, national initiatives to strengthen vital registration systems and cause-specific mortality are a key priority. In settings where many deaths are not attended by a physician, alternate methods, such as verbal autopsy, may be used to complement data collected from death certificates until vital registration systems are adequately strengthened.
- *National surveys, with physical and biochemical measurement*
All countries will need to collect data from the general population through representative national household surveys conducted at least once every five years. Information is collected through interviews, physical measurement, and biological testing. A survey that includes an interview and physical and biochemical measurement is called a health examination survey – the WHO STEPs survey is an example of this type of survey for NCDs that has been conducted in a large number of low-and middle-income countries, as are a number of other nationally coordinated surveys in high-income countries.
- *Policy reviews*
Policy indicators require a regular, systematic, and independent assessment to judge whether the policies are in place, implemented, and enforced.

In addition, to monitor country capacity to respond to NCDs, WHO will continue to conduct periodic assessments of the major components of national capacity in all Member States. Such assessments have been carried out in 2000–2001 and again in 2010. The 2010 assessment can be used as baseline¹⁰. A further assessment is planned for 2013.

The capacity assessment examines the public health infrastructure available to deal with NCDs; the status of NCD-relevant policies, strategies, action plans and programmes; the existence of health information systems, surveillance activities and surveys; access to essential health-care services including early detection, treatment and care for NCDs; and the existence of partnerships and collaborations related to NCD prevention and control.

As mentioned before, many countries will require technical and financial support to improve NCD surveillance and will require the support of global partners. Addressing data gaps and capacity building are specially needed to strengthen risk factors monitoring and death certification by cause.

Reporting and review

It is proposed that measurement against progress towards the final set of voluntary global targets and indicators is reported every five years, in 2015, 2020 and 2025. Reporting must balance country ownership and application, with comparability and transparency so that lessons can be shared and progress measured. This will require close coordination of country reporting with global analyses. The responsibility for compiling and interpreting the data and additional analyses lies with WHO, supported by an expert group of independent institutions. The reports will be presented and discussed at the World Health Assembly and the UN General Assembly.

ooo000ooo

¹⁰ Report of the 2010 global survey on assessment of national capacity for NCD prevention and control, in preparation.

References

- 1) Alwan A et al. Monitoring and surveillance of chronic non-communicable diseases: progress and capacity in high-burden countries. *The Lancet*, 2010, 376:1861-1868.
- 2) *Global status report on noncommunicable diseases 2010*. Geneva, World Health Organization, 2011.
- 3) Bloom, D. E et al. *The Global Economic Burden on Non-communicable Diseases*. Geneva. World Economic Forum, 2011
- 4) *Scaling up action against noncommunicable disease: How much will it cost? Geneva, World Health Organization, 20112008 - 2013*
- 5) *Action Plan for the Global Strategy for the Prevention and Control of Noncommunicable Diseases*, Geneva, World Health Organization, 2008.
- 6) *Declaration of First Global Ministerial Conference on Healthy Lifestyles and Noncommunicable Disease Control*, Moscow, 28-29 April 2011, URL: http://www.who.int/nmh/events/moscow_ncds_2011/conference_documents/moscow_declaration_en.pdf

Disclaimer

This discussion paper does not represent an official position of the World Health Organization. It is a tool to explore the views of interested parties on the subject matter. References to international partners are suggestions only and do not constitute or imply any endorsement whatsoever of this discussion paper.

The World Health Organization does not warrant that the information contained in this discussion paper is complete and correct and shall not be liable for any damages incurred as a result of its use

The information contained in this discussion paper may be freely used and copied for educational and other non-commercial and non-promotional purposes, provided that any reproduction of the information be accompanied by an acknowledgement of WHO as the source. Any other use of the information requires the permission from WHO, and requests should be directed to World Health Organization, Department of Chronic Diseases and Health Promotion, 20 Avenue Appia, 1211 Geneva 27, Switzerland.

The designations employed and the presentation of the material in this discussion paper do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by the World Health Organization in preference to others of a similar nature that are not mentioned. Errors and omissions excepted, the names of proprietary products are distinguished by initial capital letters.

All reasonable precautions have been taken by the World Health Organization to verify the information contained in this discussion paper. However, this discussion paper is being distributed without warranty of any kind, either expressed or implied. The responsibility for the interpretation and use of the presentation lies with the reader. In no event shall the World Health Organization be liable for damages arising from its use.

© World Health Organization, 2011. All rights reserved.

The following copy right notice applies: www.who.int/about/copyright