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# Measuring Health System Progress in Reducing Mortality from Noncommunicable Diseases

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**N**oncommunicable diseases (NCDs) now account for the lion's share of global morbidity and mortality [1]. Much of the burden is now falling on developing countries, whose relatively recent adoption of Western-style health behaviors and lifestyle choices has led to increased prevalence of risk factors for NCDs over the past decade. NCDs are compounding the burden on health systems in developing countries, which also have the greatest burden of infectious disease [2].

## Background

In response, the World Health Organization (WHO) has launched several global initiatives aimed at risk reduction, such as the Framework Convention on Tobacco Control [3]; the Global Strategy on Diet, Physical Activity and Health [4]; and the Global Strategy to Reduce Harmful Use of Alcohol [5]. The growing attention to the global impact caused by NCDs and spearheaded by the Caribbean Community and Common Market countries culminated in the United Nations (UN) General Assembly high-level meeting on NCDs on September 19 and 20, 2011, that “set a new global agenda” on NCDs [6].

The resulting political declaration expressed the political will of the signing UN member states to address the NCD challenge by means of a series of interventions, which follow WHO's guidance in NCD control [7]. In the declaration, risk reduction strategies were complemented with measures to strengthen the ability of health systems to care for people living with NCDs. Priority was given to cost-effective, feasible, and measurable interventions [8].

The political declaration (Section 61) also tasked WHO “to develop before the end of 2012, a comprehensive global monitoring framework, including a set of indicators, capable of application across regional and country settings, including through multisectoral

approaches, to monitor trends and to assess progress made in the implementation of national strategies and plans on non-communicable diseases.”

In Section 62, the political declaration called for setting global targets [7].

In response to the political declaration, WHO has started to draft a monitoring framework and voluntary targets as the basis for a consultation process with member states. The most recent version of a discussion paper regarding this framework and these targets was posted on March 22, 2012, and was open for comments until April 19, 2012 [9]. There is agreement that the indicators and targets coming out of this process are essential elements for tracking progress and are therefore a precondition for putting the political declaration into action, because they will hold decision-makers accountable and enable evidence-based priority setting and planning.

However, the indicators and targets that a global consultation process will produce will inevitably provide high-level, aggregated information, such as progress toward reducing premature NCD mortality. Regional and national decisionmakers and planners, on the other hand, will need more proximal and granular information to track progress toward high-level goals, constrained by the resources and demands in their respective jurisdictions. The relative importance of different risk factors and manifest NCDs differ across countries, and so do health systems' capabilities and resources.

To meet this aspirational agenda to optimize their response to the NCD challenge, national and regional decisionmakers will need a toolkit consisting of two components:

- A comprehensive set of indicators to guide on-the-ground prioritization decisions and track progress toward high-level targets
- Actionable data to predict the impact of changes in proximal indicators on high-level targets.

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## Needed: A Detailed NCD Monitoring System

Such a toolkit is particularly important for low- and middle-income countries, because their monitoring infrastructure and health care systems are geared toward responding to communicable diseases and because these countries lack the resources and technical capabilities to reorient both monitoring infrastructure and health care systems in the short run.

As a first step toward a toolkit that would build on the WHO indicators and targets, this occasional paper outlines a roadmap toward a comprehensive system for national and regional decisionmakers to (1) track progress toward the key WHO goal of reducing NCD mortality by 25 percent by 2025 and (2) prioritize resources and interventions to achieve that goal.

### **The Rationale for a Comprehensive Monitoring System**

Reducing NCD mortality poses an unprecedented challenge to health systems for three reasons. First, in contrast to communicable diseases, which may have different risk factors but typically originate from a singular, identifiable causative agent, the causation of NCDs is multifactorial. Individual behaviors, genetic traits, and environmental factors all interact to cause pre-disease states that then progress to manifest disease. The relative weighting and interactions of those factors can also vary across countries. For example, South Asian populations tend to have a genetically higher risk of diabetes. Similarly, several cancers have a distinct geographic profile. Health systems differ in resourcing and organization, as do cultural attitudes and beliefs. These variations imply that the characteristics of the target population should be taken into account when crafting the optimal approach to reducing NCD mortality.

Second, the lead time from risk factor exposure to development of manifest NCDs can be quite long, exceeding decades for several major disease entities. Thus, decisionmakers need leading indicators to detect the impact of early interventions and, from that feedback, will be better able to make refinements and adjustments to their strategies.

Third, in contrast to communicable diseases, it will not be possible to eradicate or cure NCDs (with the exception of early-stage cancers), implying an ever-growing cohort of individuals afflicted. As people age, they will inevitably become exposed to risk factors inherently tied to human behaviors, such as diet and physical activity, and consequently incur chronic diseases in their lifetimes. Addressing the NCD challenge to meet the key goal of reduc-

ing NCD mortality thus requires a balanced strategy of both prevention and treatment of manifest disease. Given these dynamics, it will be difficult for decisionmakers to find the optimal mix of public health interventions, in particular as the balance between prevention and treatment also relies upon intergenerational tradeoffs and time preferences.

### **The Path Toward Implementing the Monitoring System**

The complexity of the NCD challenge implies that WHO and its member states need a measurement system with a comprehensive and actionable set of indicators that builds on the proposed high-level indicators in the WHO discussion paper on this topic [9].

The development of such a measurement system typically follows four steps:

1. Develop a conceptual framework that defines the targets for measurement.
2. Select indicators to capture the components of the framework based on explicit evaluation criteria.
3. Implement the indicators, i.e., data collection and analysis.
4. Identify targets and benchmarks for the selected indicators.

### **Framework Development**

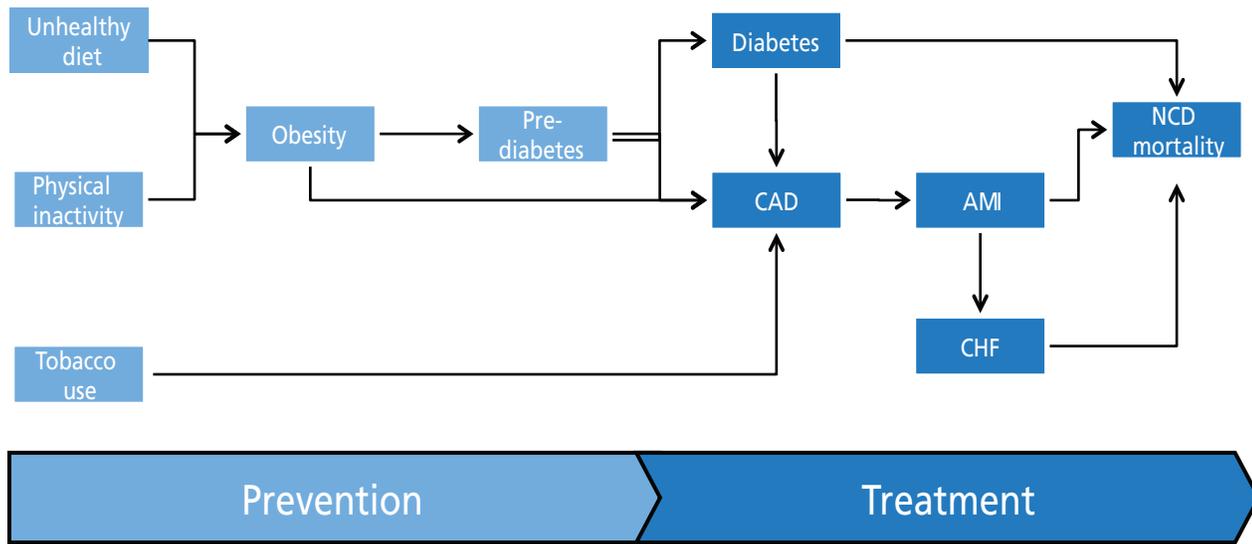
The first step in the development of a conceptual framework is typically the design of logic models that reflect the path of progression from health risks onward to disease development and mortality. An illustrative logic model is depicted in Figure 1.

The second step is then the development of the full framework based on those logic models, along with a clear definition of which concepts the eventual indicator system should capture. An illustrative framework is depicted in Figure 2. The figure also contains example indicators in each of the framework cells to show what type of metrics would be captured by the respective cell.

### **Indicator Selection**

Selection of indicators aims to cover the cells of the conceptual framework as extensively and as parsimoniously as possible. This means that an indicator set should capture all relevant dimensions but not be overly burdensome. As the WHO discussion paper [9] points out, indicator selection should be based on explicit criteria, such as relevance, scientific soundness, technical feasibility, and usability for decisionmakers. It is also critical to make the

**Figure 1**  
**Illustrative Logic Model for Causation of NCD Mortality**



NOTE: CAD is coronary artery disease; AMI, acute myocardial infarction; and CHF, congestive heart failure.

selection process transparent and inclusive to ensure stakeholder buy-in.

**Indicator Implementation**

Indicator implementation includes development of the data collection and/or extraction procedures and the analytic approach to construct the actual indicator from the underlying data sources. In an ideal world, definitions, data sources, and construction of indicators would be harmonized across countries to allow proper benchmarking. In reality, implementation of harmonized conventions is a difficult and time-consuming process.

The recent, relevant experience of the Organisation for Economic Co-operation and Development (OECD) Health Care Quality Indicators project (see text box) shows that gradual harmonization can be achieved over time but also that it requires resources, technical expertise, and a long-term commitment from participants. Thus, it seems unlikely that most indicators will be harmonized across WHO member states in the short run. It seems equally unlikely that every country will be able to collect or extract the required data to implement all the indicators in a comprehensive framework.

However, national decisionmakers do not necessarily require fully harmonized indicators to prioritize interventions within their jurisdiction, nor will they need the complete set of indicators that the framework would contain. An incremental approach is thus

the most practical path forward. From the measurement system, national decisionmakers would select a core set of indicators that are relevant for immediate allocation and planning decisions, and then they would add indicators as needs and policy questions change. This core set would reflect each country’s pattern of NCDs and its intended path toward reducing NCD mortality. Harmonization of definitions would remain a goal, but one that is pursued gradually over time and that would start with regional efforts.

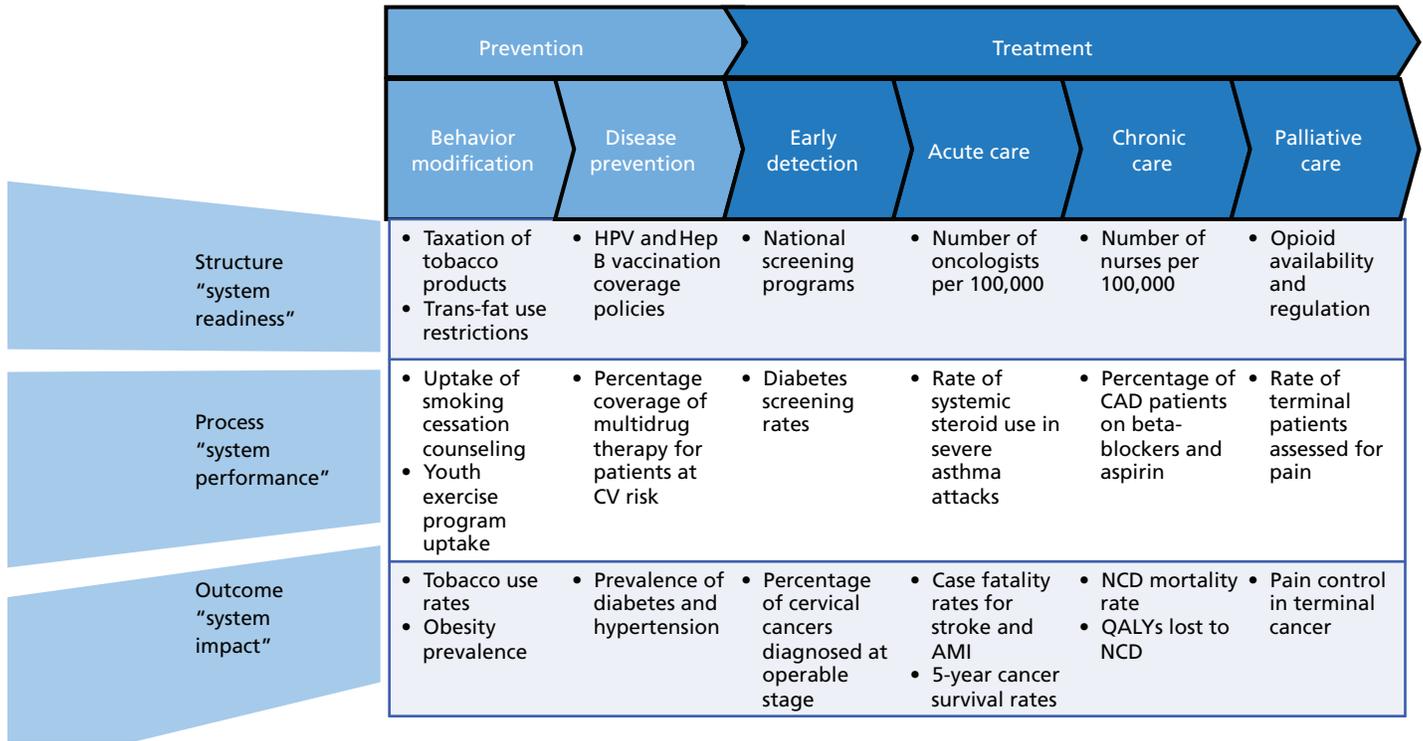
**Target Setting**

The WHO discussion paper [9] lists a variety of targets to address the NCD challenge. The list appropriately focuses on high-level outcomes, such as obesity preva-

**The OECD Health Care Quality Indicators Project**

The project was initiated in 2002 and aims to measure and compare the quality of health service provision in OECD countries. Expert groups have developed a set of quality indicators at the health systems level, which allows assessing the impact of particular factors on the quality of health services, and are working toward gradually standardizing definitions across countries. The project complements and coordinates efforts of national and other international bodies. These efforts will offer policymakers and other stakeholders a toolkit to stimulate cross-national learning [10].

**Figure 2**  
**Illustrative Conceptual Framework for Measurement System**



NOTE: AMI is acute myocardial infarction; CAD coronary artery disease; CV cardiovascular; HPV human papilloma virus; Hep B, hepatitis B; QALY, quality adjusted life year.

lence and reduction of premature NCD mortality. In addition, policymakers will need targets for structural and procedural indicators to gauge progress toward achieving high-level outcomes in the short run. Again, it is important to keep in mind that reduction of NCD mortality requires a balanced use of prevention strategies and treatment of manifest disease. It then follows that decisionmakers need to understand the relative contribution of each component in order to optimize resource allocation. It is similarly critical to have data points on the relative impact of different interventions, such as, for example, (1) the “number needed to treat,” which would show how many people would have to receive a given intervention to avoid, for example, one premature NCD death and (2) the “time to effect,” which would capture the delay between the intervention and the change in outcomes. Preventive interventions tend to require a much higher number needed to treat (prevent) and a longer time to effect than treatments would, and decisionmakers need to have actionable information in order to make appropriate tradeoffs. In addition, the time to respond to preventive interventions differs across diseases. For example, smoking cessation has a

more immediate impact on cardiovascular morbidity and mortality than on the development of cancer.

**Next Steps**

We propose as the next step consultations with WHO UN agencies, development agencies, and member state representatives about the need for an expanded measurement system, as we outline here, building on the global framework that will be agreed upon soon by member states. Valuable lessons can be learned from the experience of these institutions with implementing measurement systems to track progress toward control of HIV/AIDS. These consultations would clarify the requirements for information that development agencies and national authorities have to make rational decisions in allocating resources toward reducing the burden of NCDs. They would also provide guidance on the best path toward implementation of the envisioned toolkit. ■

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This Occasional Paper results from the RAND Corporation's Investment in People and Ideas program. Support for this program is provided, in part, by the generosity of RAND's donors and by the fees earned on client-funded research. The work was conducted in RAND Health, a division of the RAND Corporation. A profile of RAND Health, abstracts of its publications, and ordering information can be found at [www.rand.org/health](http://www.rand.org/health).

We are grateful to Andreas Ullrich and Marla Haims for their insights and constructive comments on an earlier version of this paper.

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