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EDITORIAL VIEWPOINT

A Conceptual Strategy to Address CVD and Related Chronic Diseases in the Developing World

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The many interrelated risk factors that influence cardiovascular health involve aspects of economies and societies that extend far beyond public health and health systems. This underscores the complexity of any undertaking to promote cardiovascular health and to prevent and manage cardiovascular disease (CVD). In addition to being complex, CVD is also a long-term problem. It cannot be addressed through a singular, time-limited commitment but rather requires long-term interventions and sustainable solutions.

This article, excerpted from the Institute of Medicine report, *Promoting Cardiovascular Health in the Developing World: A Critical Challenge to Achieve Global Health*, outlines the ideal vision of a comprehensive approach to promote cardiovascular health and reduce the burden of cardiovascular disease [1]. The IOM report provides a thorough consideration of the rationale and evidence for the components of the ideal comprehensive approach described here. In addition, recognizing the local realities and practical constraints that exist in developing countries, the report identifies, based on the totality of the available evidence on disease determinants, intervention effectiveness, and economic analysis, what is most advisable and feasible in the short term and what might hold promise as part of longer-term strategies.

IDEAL STRATEGY TO ADDRESS GLOBAL CVD IN THE DEVELOPING WORLD

The factors that contribute to the burden of CVD and related chronic diseases and are the targets for change in the quest to promote global cardiovascular health can be divided into behavioral factors (such as tobacco use, diet, and physical activity); biological factors (such as blood pressure, cholesterol, and blood glucose); psychosocial factors (such as depression, anxiety, acute and chronic life stressors, and lack of social support); health systems factors (such as access to care, screening, diagnosis, and quality of care); and intersectoral factors (such as tobacco control policies and agricultural policies). The evidence describing the interrelated determinants of CVD provides a strong conceptual basis for a strategy that coordinates across multiple sectors and integrates health promotion, prevention, and disease management as part of a long-term, comprehensive approach. This approach would employ multiple intervention strategies in a mix of programs and policies that accommodate variations in need according to context and locale.

The ideal approach would take advantage of opportunities for intervention at all stages of the life course in order to promote cardiovascular health by preventing acquisition and augmentation of risk, detecting and reducing risk, managing CVD events, and preventing the progression of disease and recurrence of CVD events. Policies and programs to change the factors that contribute to CVD would be designed to work through population-wide approaches; through interventions within health systems; and through community-based programs with components in schools, worksites, and other community settings. A comprehensive strategy of this kind that takes into account the full range of complex determinants of CVD, illustrated in Fig. 1, would have the theoretical potential to

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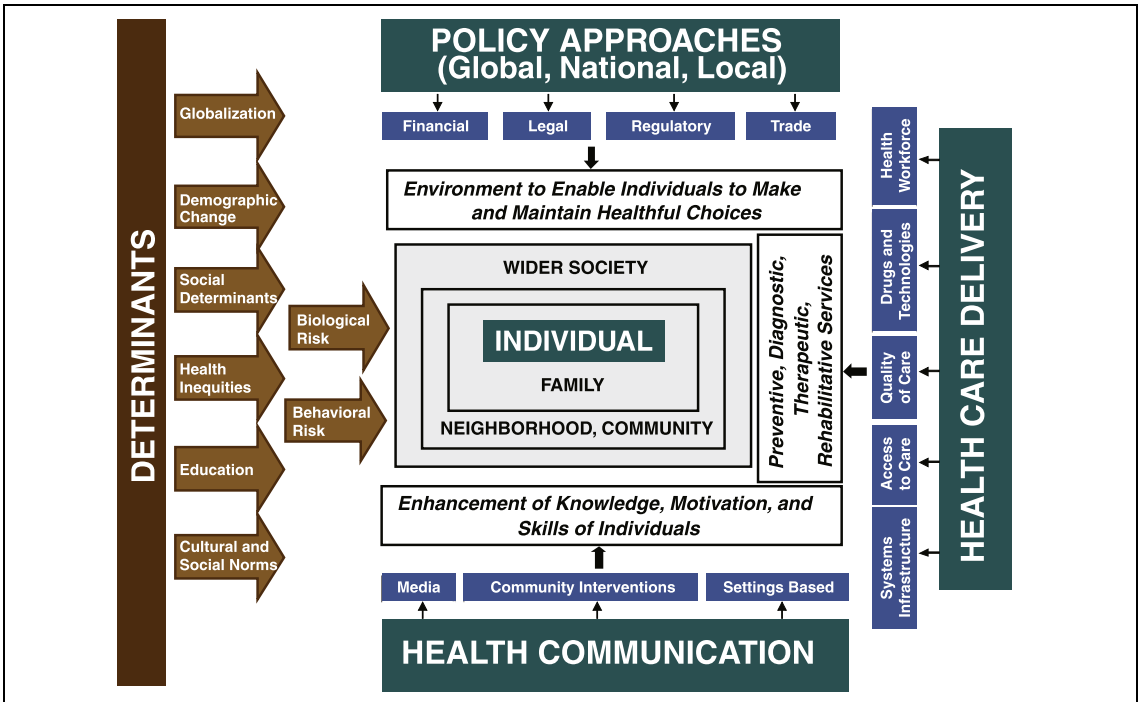

Fig. 1. **Comprehensive strategy to address cardiovascular disease and related chronic diseases.**

produce a synergistic interaction among approaches at individual and population levels. Concurrent modalities could include policy and regulatory changes, health promotion campaigns, innovative applications of communications technologies, efficient use of medical therapies and technologies, and integrated clinical programs. For individuals already at high risk or with existing disease, this approach would combine education, support, and incentives to both address behavioral risk factors and improve adherence to clinical interventions. Participation in this approach extends beyond clinical providers and public health approaches to also include public media outlets, community leaders, and related sectors, especially food and agriculture policy, transportation and urban planning, and private-sector entities such as the food and pharmaceutical industries. All these players are potential partners both in assessing needs and capacity and in developing and implementing solutions.

BUILDING A STRATEGY TO ADDRESS CVD

The following briefly outlines the series of components needed for countries and supporting global stakeholders to build a strategy to promote cardiovascular health. As described above, these components would ideally be integrated to work toward a comprehensive intervention strategy. The intent is to develop a supportive policy environment and build the capacity to develop, implement, and evaluate intervention programs, with the ultimate goal of reducing the burden of CVD through reduction of risk factors and management of disease. This includes "top-down" policies and complementary "bottom-up" approaches in health care delivery systems and in community-based education and health promotion programs. The specific components within each of these steps and examples of the available evidence to support their implementation are described in the IOM report, along with more discussion of the limitations, taking into account gaps in the evidence and variations among countries in baseline capacity, economic status, and level of infrastructure.

Needs and capacity assessment. A crucial basis for developing policies and programs is for governments and communities to estimate and, where possible, measure the nature of the problem as it occurs in the local context where approaches will be implemented; to assess the needs of the population; to catalog current efforts; to assess the available capacity and infrastructure to address CVD

and related chronic diseases; and to gauge the political will to support the available opportunities for action. This assessment will inform priorities and determine choices about the implementation of evidence-based policies and programs as well as capacity-building efforts. This should lead to specific and realistic goals for intervention strategies that are adapted to local baseline capacity and burden of disease and that also aim to improve that baseline capacity.

Country-level measurement, assessment, and prioritization of this kind can occur at the level of national or local governments, such as provincial or city-level health authorities. In many low and middle income countries, this will require the development of sufficient capacity and infrastructure to carry out population-based approaches for measuring cause-specific mortality and behavioral and biological risk factors. In countries with very limited capacity at baseline, at first it may be nongovernmental organizations, foreign assistance agencies, and other donors who need to carry out a needs assessment and prioritization before implementing programmatic efforts. Regardless of the driving force behind the initiated action, this strategic planning can, to the extent possible, involve local authorities, be harmonized with local efforts, and be designed as an opportunity to improve local baseline capacity over time.

Policy strategies. When a baseline is established and priorities are determined based on country-level data, the starting place for developing intervention approaches is policy strategies for population-based prevention. The primary population approach can be based on setting or changing policies, incentives, and regulations, especially those related to food, agriculture, and tobacco. There is evidence to support the implementation of some of these policies in the immediate term. For those developing countries where there exist democratic means to develop policies and where regulatory and enforcement capacity is sufficient, these policy changes may include, for example, taxation and regulations on tobacco production and sales; regulations on tobacco and food marketing and labeling; alterations in subsidies for foods and other food and agricultural policies; and strategies to make rapid urbanization more conducive to health. Regulatory change usually needs to be incremental and should be proportional to the possible impact and cost.

Health communications. Both in coordination with policy changes and as a separate strategy for affecting crucial CVD-related behaviors, there is substantial promise in implementing health communications and education efforts. Public communication interventions that are coordinated with select policy changes can enhance the effectiveness of both approaches, which together can help create an environment in which more targeted programs in health systems and communities can succeed. Even in the absence of an ideal policy environment, well-constructed stand-alone population-level health communication efforts have the potential to be effective in encouraging population behavior change, for example, in areas such as smoking initiation and salt and fat consumption. Depending on the governmental infrastructure within a country, policies with coordinated communication and health education efforts can occur at the level of national or local authorities.

Delivery of quality health care. Along with select population-based approaches, a key step in addressing CVD is to strengthen health systems to deliver high-quality, responsive care for the prevention and management of CVD. Improving health care delivery includes, for example, provider-level strategies, financing, integration of care, workforce development, and access to essential medical products. The need to strengthen health systems in low and middle income countries is not specific to CVD, and it is important that ongoing efforts in this area take into account not only traditional focus areas such as infectious disease and maternal and child health but also CVD and related chronic diseases as well as chronic care needs that are shared among chronic non-infectious diseases and chronic infections such as HIV/AIDS and tuberculosis.

Community-based programs. Along with efforts to implement population-based approaches and to strengthen health systems, an ideal comprehensive integrated approach would also include community-based programs that offer opportunities to access individuals where they already gather, such as schools, worksites, and other community organizations. Depending on local priorities, there is potential for synergism in both effectiveness and economic feasibility through coordinated interventions that target multiple risk factors, are conducted in multiple settings in communities, and coordinate the health systems and population-based strategies described above with related, community-specific strategies. Because of the lack of community-based models that have been successfully implemented, evaluated, and sustained in low and middle income country settings, the

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critical next step in these settings is to support research to develop and evaluate demonstration projects through implementation trials. In many cases, the focus can be on adapting and evaluating programs with demonstrated success in developed countries. The design of demonstration programs will need to take into account local infrastructure and capacity to develop and maintain such programs over time, particularly if they are ultimately intended to affect a large portion of the population and operate on a large scale.

Scale-up and dissemination. The ultimate goal when intervention approaches in all these domains are demonstrated to be effective and feasible is scale-up, maintenance, and dissemination. In addition to implementing best practices and evidence-based policies and programs on a larger scale, this includes disseminating in a broader global context, by sharing knowledge among similar countries with analogous epidemiological characteristics, capacity, and cultural norms and expectations.

Ongoing monitoring, evaluation, and assessment. Ongoing surveillance and evaluation of implemented strategies will allow policy makers and other stakeholders to determine if implemented actions are having the intended effect and meeting the defined goals, and to reassess needs, capacity, and priorities over time. This will be critical to alter policies and programs as priorities change, as new lessons are learned, and as a country goes through inevitable transitions in its economy and its health or social environments.

Global support. As described in more detail in the accompanying *Framework for Action* in this issue, international agencies can play an important role in working toward comprehensive country-level approaches. These agencies can help initiate and enrich any country's CVD prevention and management process through direct financial and technical assistance. In addition, external aid and coordination can facilitate the transfer of lessons learned among countries, allowing each country to actively contribute to the international repertoire of prevention strategies.

IMPLEMENTATION IN LOW AND MIDDLE INCOME COUNTRIES

The comprehensive approach described here stands as an ideal for countries facing the burden of CVD and for global stakeholders in the fight against CVD and related chronic diseases. Reality, of course, complicates this ideal considerably. A comprehensive integrated approach of this kind has not been successfully implemented in a model that can be readily replicated in low and middle income country settings. Progress in high income countries points to models for many of the components that could make up such an ideal approach to CVD, but interventions that may be efficacious in certain settings cannot be assumed to be effective if they are implemented in settings that have significantly different available resources and differ significantly at the level of policy or population characteristics.

Local context matters enormously for the planning and implementation of any of the approaches to prevent and manage CVD. Context also influences the effectiveness of these approaches. While there are common needs and priorities across settings, each site has its own specific needs that require evaluation. Knowledge needs to be developed on how to implement programs with proven effectiveness in settings where resources of all types are scarce, where priorities remain fixed on other health and development agendas, and where cultural and influences vary. Implementation and translational research will be critical to develop and evaluate interventions in the settings in which they are intended to be implemented.

Nevertheless, although the components are likely to work best in synergy with each other, the lack of readiness and capacity to accomplish the comprehensive ideal is not reason to do nothing. An impact on the very high burden of CVD is possible even without doing everything that makes up the ideal. Indeed, developing countries will want to focus more pragmatically on efforts that promise to be economically feasible, have the highest likelihood of intervention success, and have the largest morbidity impact. While prioritizing limited resources in this way in the short term, the groundwork can be laid for building up to more comprehensive approaches. The IOM report provides a thorough analysis to help determine what policies, programs, and clinical interventions have sufficient evidence for priority implementation in developing countries in the near term and what approaches have a solid conceptual basis but require greater knowledge based on specific policies and programs with demonstrated effectiveness and implementability in developing-country settings in order to make progress toward implementation in the medium and long term. In addition, the report discusses the feasibility and prioritization of applying limited resources in low and middle in-

come countries with a synthesis of the available economic evidence and future economic research needs. The report also describes the essential functions that are needed to address global CVD and how the major stakeholders in CVD, in related chronic diseases, and in global health and development can be organized at global, national, and local levels to create a framework for implementing the necessary actions to control the global epidemic of CVD. This *Framework for Action* is described elsewhere in this issue.

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Excerpts reprinted from *Promoting Cardiovascular Health in the Developing World: A Critical Challenge to Achieve Global Health* (2010) with permission from the National Academy of Sciences, Courtesy of National Academies Press, Washington, DC. The full report is available at www.nap.edu.

REFERENCE

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