



## Welcoming the Next Generation of Diseases (Editorial)

Raymond A. Smego

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Correspondence concerning this article should be addressed to Professor Dr. Raymond A. Smego, The Commonwealth Medical College; 501 Madison Avenue, Suite 200; Scranton, PA 18510, United States  
Tel: (570)-955-1315; Email: [rsmego@tcmedc.org](mailto:rsmego@tcmedc.org)

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## Welcoming the Next Generation of Diseases

**Raymond A. Smego**

The Commonwealth Medical College, USA

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### ABSTRACT

As global populations age because of public health successes, increasingly, people are living with one or more chronic conditions for decades. Chronic conditions are projected to be the leading cause of disability throughout the world by the year 2020, and without successful prevention or control they will also become the most expensive problems faced by global health care systems. Persons with diabetes, as an example, generate health care costs that are 2-3-fold higher than non-diabetics, and in Latin America the costs of lost production due to diabetes are estimated to be five times the direct health care costs. The current special issue of International Journal of Collaborative Research on Internal Medicine & Public Health (IJCRIMPH) has focused on "Chronic Disease Epidemiology".

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### EDITORIAL

As global populations age because of public health successes, increasingly, people are living with one or more chronic conditions for decades. Chronic conditions are projected to be the leading cause of disability throughout the world by the year 2020, and without successful prevention or control they will also become the most expensive problems faced by global health care systems. Persons with diabetes, as an example, generate health care costs that are 2-3-fold higher than non-diabetics, and in Latin America the costs of lost production due to diabetes are estimated to be five times the direct health care costs.<sup>1</sup>

Many low- and middle-income countries are presently facing the millennial problems of infectious diseases and under-nutrition at the same time they are experiencing a rapid upsurge in chronic disease risk factors such as obesity and overweight, particularly in urban settings. It is not uncommon to find under-nutrition and obesity existing side-by-side within the same country and the same

community. This double burden is caused by inadequate prenatal, infant and young child nutrition followed by exposure to high-fat, energy-dense, micronutrient-poor foods and lack of physical activity. In almost every region of the planet first-generation diseases like malnutrition, communicable diseases, and vaccine-preventable childhood diseases now co-exist or are being supplanted by second-generation chronic diseases, i.e., diseases of long duration and generally slow progression. Chronic diseases, several of which are topics of this special issue of the *Journal* -- cardiovascular diseases (CVDs), hypertension stroke, and diabetes mellitus -- are now by far the leading cause of mortality in the world, representing 60% of all deaths.<sup>2</sup> Furthermore, "lifestyle" diseases related to alcoholism, tobacco and illicit drug use and depression are major public health entities in developed, transition and developing countries. Thus, chronic conditions pose huge health and economic threats to countries of the world.

As background, a few statistics are in order: CVDs are the number one cause of death globally; in 2004 an estimated 17.1 million

people died from CVDs, representing 29% of all global deaths.<sup>3</sup> Low- and middle-income countries are disproportionately affected: 82% of CVD deaths take place in low- and middle-income countries and occur almost equally in men and women. This is largely because most of the behavioral risk factors (i.e., diet, physical inactivity, and tobacco use) that cause CVDs are less often modified in poorer countries than in more affluent populations. The effects of unhealthy diet and physical inactivity show up in individuals as 'intermediate risk factors' – elevated blood pressure, blood glucose, and lipids, and overweight and obesity. By 2030, almost 23.6 million people will die from CVDs, mainly from heart disease and stroke.<sup>3</sup> The largest percentage increase will occur in the Eastern Mediterranean Region, and the largest increase in number of deaths will occur in the South-East Asia Region.

Cardiovascular diseases are increasingly becoming a development issue in low- and middle-income countries. Populations who suffer from CVDs and other non-communicable diseases have less access to effective and equitable health care services, including prevention and early detection services. As a result, many people in low- and middle-income nations die younger from CVDs and other non-communicable diseases, often in their most productive years. CVDs and other non-communicable diseases may also contribute to poverty. For example, catastrophic health care expenditures for households with a family member with CVD can be 30 per cent or more of annual household spending. At the macro-economic level, CVDs place a heavy burden on the economies of low- and middle-income countries; for those nations experiencing rapid economic growth, heart disease, stroke and diabetes are estimated to reduce GDP between 1% and 5% as many people die prematurely. Over the period from 2006-2015 China is estimated to lose \$558 billion in foregone

national income due to the combination of heart disease, stroke and diabetes.<sup>3</sup>

Three of the papers in this special issue concern diabetes, a disease that affects more than 220 million people worldwide, and with an estimated 1.1 million annual deaths, almost 80% of which occur in low- and middle-income countries. The World Health Organization (WHO) projects that diabetes-related deaths will double during the period from 2005 to 2030.<sup>4</sup> Cancer accounted for 7.4 million deaths (or around 13% of all deaths worldwide) in 2004, with an estimated 12 million deaths projected in 2030.<sup>5</sup> More than 70% of all cancer deaths occur in low- and middle-income countries. The most frequent types of cancer worldwide (in order of the number of global deaths) are: among men - lung, stomach, liver, colorectal, esophagus and prostate; among women - breast, lung, stomach, colorectal and cervical. Some examples of infections associated with certain cancers: 1) oncogenic viruses: hepatitis B and liver cancer, human papilloma virus and cervical cancer, and human immunodeficiency virus and Kaposi's sarcoma-associated herpesvirus and Kaposi sarcoma; 2) bacteria: *Helicobacter pylori* and stomach cancer; 3) parasites: schistosomiasis and bladder cancer. Surveillance and collection of quality health information are essential for planning and implementing health policy in all countries. Risk factor data are especially important as predictors of future disease or injury. The World Health Report 2002: Reducing Risks, Promoting Healthy Life, identified five important risk factors for non-communicable disease in the top ten leading risks to health: raised blood pressure, raised cholesterol, tobacco use, alcohol consumption, and overweight.<sup>6</sup> These risk factors share common characteristics that include having the greatest impact on death and illness from a disease/or injury; the ability to be modified through effective primary prevention; measurement protocols which have been validated; and a

method of taking measurements that does not violate ethical principles.<sup>7</sup>

Traditional methods of quantifying disease in populations, such as incidence, prevalence, mortality, birth rate, and infant mortality rate, do not capture nonfatal health outcomes. In the past three decades, significant international effort has been put into the development of composite indicators that include both mortality and morbidity measures in order to make judgments about the health of populations and to identify which interventions would have the greatest effect. The two types of composite measures -- health gaps [e.g., disability-adjusted life years (DALYs) and healthy life years (HeaLYs)] and health expectancies [e.g., disability-free life expectancy (DFLE) and health-adjusted life expectancy (HALE)] are especially valuable in assessing the global impact of chronic diseases.<sup>2</sup>

The STEPwise approach to Surveillance (STEPS), developed by the WHO, is a sequential process of gathering comparable and sustainable non-communicable disease risk factor information at the country-level.<sup>7</sup> STEPS is based on collection of standardized data from representative populations of specified sample size to ensure comparability over time and across locations. Step 1 gathers information on risk factors that can be obtained from the general population by questionnaire. This includes information on socio-demographic features, tobacco use, alcohol consumption, physical inactivity, and fruit/vegetable intake. Step 2 includes objective data by simple physical measurements needed to examine risk factors that are physiologic attributes of the human body. These are height, weight, waist circumference (for obesity) and blood pressure. Step 3 carries the objective measurements of physiologic attributes one step further with the inclusion of blood samples for measuring lipid and glucose levels. Fifty-eight countries across five WHO

Regions (Southeast Asia, Western Pacific, Africa, Eastern Mediterranean, Americas) have published the results of their STEPS surveys.<sup>8</sup>

Many chronic diseases can be prevented, yet health care systems do not make the best use of their available resources to support this process. All too often, health care workers fail to seize patient interactions as opportunities to inform patients about health promotion and disease prevention strategies. Furthermore, most current health care systems are based on responding to acute problems, urgent needs of patients, and pressing concerns. Testing, diagnosing, relieving symptoms, and expecting a cure are hallmarks of contemporary health care. While these functions are appropriate for acute and episodic health problems, a notable disparity occurs when applying this model of care to the prevention and management of chronic conditions. Preventive health care is inherently different from health care for acute problems, and in this regard, current health care systems worldwide fall remarkably short. Essential elements for developing effective measures against chronic diseases include a paradigm shift towards integrated, preventive health care, promotion of financing systems and policies that support prevention in health care, equipping patients with needed information, motivation, and skills in prevention and self-management, and incorporating prevention in every health care interaction. The following are WHO-cited examples of innovation and successful implementation of one or more components of prevention in health care.<sup>7</sup>

Cearà, a poor state in Brazil presents a model of care that may be achievable for other countries in which resources, income, and education levels are limited. In 1987, auxiliary health workers, supervised by trained nurses (one nurse to 30 health workers) and living in local communities, initiated once-monthly home visits to families to provide several

essential health services. The program was successful in improving child health status and vaccinations, prenatal care, and cancer screening in women and it was low cost, too. Salaries for the health workers were normal wage, few medications were used, and no physicians were included. Overall, the program used a very small portion of the state's health care budget. In 1994, the health worker program integrated into the Family Health Program that includes physicians and nurses on the care team with the health workers thus creating large scale integrated, preventive health services.<sup>9</sup>

During the past decade, Kaiser Permanente, a large managed care organization in California, US, reoriented its primary care clinics to better meet the needs of patients, emphasizing the needs of those with chronic conditions.<sup>10</sup> Multidisciplinary teams were created that include physicians, nurses, health educators, psychologists, and physical therapists. These primary care teams link with pharmacy, a telephone advice and appointment center, chronic conditions management programs, and specialist clinics creating a totally integrated system of care from outpatient clinics to inpatient hospital care.

Patients are enrolled in the chronic conditions management programs via outreach strategies that identify those with chronic conditions who have not sought primary care, and through physician identification during primary care office visits. Patients receive services from multiple disciplines, based on the intensity of their needs. There is an emphasis on critical three levels of care: prevention, patient education, and self-management. Non-physician team members facilitate group appointments. With this new chronic diseases model, biological indices have improved across conditions such as heart disease, asthma, and diabetes. Screening and preventive services have increased and hospital admission rates have declined. A recent comparison of Kaiser's integrated care

system with the UK's National Health System found that although costs per capita in each system were similar, Kaiser's performance was considerably better in terms of access, treatment, and waiting times.<sup>11</sup> Explanations for Kaiser's better performance included real integration across all components of health care, treating patients at the most cost-effective level of care, market competition, and advanced information systems.

Many chronic diseases are linked by common preventable risk factors, and many of the costly and disabling conditions facing health systems today can be prevented and many of their complications can be averted or delayed. Integrated approaches focus on the main common risk factors for a range of chronic diseases such as CVDs, diabetes and cancer: unhealthy diet, physically inactivity and tobacco use. Comprehensive action to reduce or prevent chronic diseases combines approaches that seek to reduce the risks throughout the entire population with strategies that target individuals at high risk or with established disease.<sup>6</sup> Individual-based strategies for reducing onset and complications include enhanced patient and community education, early detection, increasing physical activity, reducing tobacco use, and limiting prolonged, unhealthy nutrition. Examples of population-wide interventions that can be implemented to reduce chronic diseases include: comprehensive tobacco control policies, taxation to reduce the intake of foods that are high in fat, sugar and salt, building walking and cycle ways to increase physical activity, and providing healthy school meals to children.<sup>6</sup>

In conclusion, chronic diseases, especially CVDs, diabetes, and cancer remain neglected globally despite growing awareness of the serious burden that they cause. Low-cost and highly effective solutions for the prevention of chronic diseases are readily available, and the failure to respond is more often related to

political rather than technical issues. Geneau and coworkers recommend three strategies for generating increased political priority for chronic diseases and furthering involvement of development agencies: reframing the debate to emphasize the societal determinants of disease and the interrelation between chronic disease, poverty, and development; mobilizing resources through a cooperative and inclusive approach to development and by equitably distributing resources on the basis of avoidable mortality; and building one merging strategic and political opportunities, such as the World Health Assembly 2008–13 Action Plan and the high level meeting of the UN General Assembly in 2011 on chronic diseases.<sup>12</sup> As these authors succinctly conclude, “Until the full set of threats — which include chronic diseases — that trap poor households in cycles of debt and illness are addressed, progress towards equitable human development will remain inadequate.”

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