



Review

A Global Perspective on Cardiovascular Disease in Vulnerable Populations

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ABSTRACT

Cardiovascular disease (CVD) is a major contributor to the growing public health epidemic in chronic diseases. Much of the disease and disability burden from CVDs are in people younger than the age of 70 years in low- and middle-income countries, formerly “the developing world.” The risk of CVD is heavily influenced by environmental conditions and lifestyle variables. In this article we review the scope of the CVD problem in low- and middle-income countries, including economic factors, risk factors, at-risk groups, and explanatory frameworks that hypothesize the multifactorial drivers. Finally, we discuss current and potential interventions to reduce the burden of CVD in vulnerable populations including research needed to evaluate and implement promising solutions for those most at risk.

RÉSUMÉ

La maladie cardiovasculaire (MCV) contribue de manière importante au problème de santé publique croissant que représente l'épidémie de maladies chroniques. La majeure partie du fardeau de la MCV et de l'incapacité qu'elle occasionne touche les personnes âgées de moins de 70 ans vivant dans les pays à revenu faible ou intermédiaire, anciennement appelés « les pays en voie de développement ». Le risque de MCV est fortement déterminé par les conditions environnementales et le mode de vie. Dans cet article, nous nous penchons sur l'ampleur du problème posé par la MCV dans les pays à revenu faible ou intermédiaire, en examinant notamment les facteurs économiques, les facteurs de risque et les groupes à risque ainsi que les cadres explicatifs des hypothèses sur les multiples variables en cause. Enfin, nous analysons les interventions déjà en cours et les mesures susceptibles de réduire le fardeau de la MCV dans les populations vulnérables, y compris la réalisation des études requises pour pouvoir évaluer et mettre en place des solutions prometteuses ciblant les personnes les plus à risque.

Cardiovascular disease (CVD) is a major contributor to the growing public health epidemic in chronic diseases or non-communicable diseases (NCDs). Much of the disease and disability burden from NCDs are in people younger than the age of 70 years in low- and middle-income countries (LMICs), formerly “the developing world.” This has major

implications for the prevention, detection, treatment, and follow-up of NCDs including CVD.

Terminology

According to the World Health Organization (WHO), CVD includes coronary heart disease (CHD), stroke, peripheral arterial disease, rheumatic and congenital heart disease, and deep vein thrombosis. The 2 main contributors to CVD morbidity and mortality are stroke and CHD.¹ We will therefore limit our discussion primarily to these 2 conditions.

“Chronic disease” is a broad category that includes NCDs (primarily CVD, diabetes, chronic lung disease, chronic

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kidney disease, and diabetes) and some chronic infections (eg, HIV/AIDS, tuberculosis). Although the term NCD is used to distinguish them from infectious or communicable diseases, some chronic diseases have an infectious component. Others refer to chronic diseases as “lifestyle-related” to emphasize the importance of individual behaviours in their development, prevention, and treatment. However, the risk of developing these diseases is heavily influenced by environmental conditions that shape individual choices. In addition, lifestyle variables are also important for many communicable diseases.

Because of the intense discussion by international agencies such as the United Nations on how to address NCDs, and CVD, as a major contributor to NCDs, we will use the term, “NCD” throughout this article unless we are drawing attention to a point related specifically to CVD.² In this article we review the scope of the NCD problem including economic factors, modifiable and nonmodifiable risk factors, at-risk groups, and explanatory frameworks that hypothesize the multifactorial drivers of the problem. Finally, we discuss current and potential interventions to reduce the burden of NCDs in vulnerable populations including research needed to evaluate and implement promising solutions for those most at risk.

The Problem: NCDs and CVD

Significance of NCDs

NCDs have been called “the dominant public health challenge of the 21st century,”³ and a “public health emergency in slow motion.”⁴ They are responsible for nearly two-thirds of all global deaths.⁵ This figure has been steadily increasing over time from 57.2% of global deaths in 1990 to 63% in 2008. This figure is expected to increase by another 15% by 2020, reaching 5 times the number of deaths from communicable diseases by 2030.^{5,6} CVD is the leading NCD, accounting for nearly half of the world’s NCD-related deaths.^{7,8} Most of these deaths are due to CHD and stroke, with peripheral arterial or vascular disease and other conditions playing lesser roles.

Clearly any discussion of CVD beyond an examination of programs to prevent or treat specific diseases should be couched within an understanding of the larger NCD epidemic. Much work has been done to bring this crisis to the attention of governments, health departments, policy- and decision-makers, and funders at the global and regional levels. Therefore, in this article we draw on literature on causes and remedies for the NCD crisis with specific attention paid to CVD among vulnerable populations.

Risk factors for NCDs and CVD

There is overwhelming consensus that NCDs, including CVD, are largely associated with 4 so-called conventional or lifestyle risk factors: poor diet, physical inactivity, tobacco use, and excessive alcohol use. There is incontrovertible evidence that these factors are associated with hypertension, increased blood sugar and cholesterol levels, type 2 diabetes mellitus (T2DM), and other risk factors that are precursors of CVD.^{2,9-14} There are other unmodifiable risk factors such as age, male sex, and family history of early-onset CHD, which might be important when designing NCD programs.

Who Is at Greatest Risk?

When considering ways to address the NCD/CVD crisis it is important to consider which groups and individuals are at greatest risk and therefore should be the focus of risk-reduction and treatment programs.

Women

NCDs are the biggest threat to women’s health globally, linked to 65% of female deaths worldwide.⁷ CVD is the leading cause of death in women globally, responsible for 33.2% of female deaths in 2008, ahead of infectious and parasitic diseases (13.9%) and cancers (13.0%).^{15,16} Among women, CHD deaths outnumber strokes in high- and low-income countries (LICs) and NCDs are a significant cause of female death in LMICs during childbearing years and cause considerable suffering and disability among older women.¹⁷ It is also important to note that low socioeconomic status (SES), strongly linked to the risk of NCDs, has a stronger effect on women than on men.¹⁸

The poor

Once known as a disease of the rich, research has shown that disadvantaged groups are at greater risk for CVD. The inverse relationship between SES—a combined sociological and economic measure of one’s work experience and relative economic and social position based on income, education, and occupation¹⁷—and CVD incidence and mortality has been shown across several populations.¹⁸⁻²² Rates of smoking, heavy drinking, obesity, and diabetes are more prevalent among the poor²³⁻²⁹ not only because of increased exposure but also the relative lack of opportunity for physical activity, healthier foods, and preventive services or care.^{12,29-31} For this reason it is not accurate to state that lifestyle choices individuals make are responsible for increasing or decreasing their risk for an NCD because they are often made in response to social determinants of health.³²

Recent studies show a bidirectional relationship between CVD and poverty. The poor in high- and middle-income countries (MICs) and in urban centres of LICs are more likely to spend proportionately greater amounts of their income on tobacco products and the less expensive processed foods that are high in calories and salt, which increases their risk for disease.^{31,32} They also must spend proportionately more to pay for the long-term clinical care for NCDs.³² At national and regional levels the growing burden of NCDs has been implicated as a major barrier to socioeconomic development.³³

People in LMICs

Many recent documents on global health categorize countries into levels based on their gross national income per capita based on USD in 2010 (low income: \leq \$1005; middle income: \$1006-\$12,275; high income: \geq \$12,276).^{34,35} The term “upper MIC” is now beginning to appear in economic and health literature, referring to one of 4 categories in the updated classification system³⁶ (low income: \leq \$1035; lower middle income: \$1036-\$4085; upper middle income: \$4086-\$12,615; high income: \geq \$12,616). These distinctions are widely used in comparisons of the economic and health status of countries even though they fail to capture nations’

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