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Barriers to Global Action Plan for the Prevention and Control of Non-communicable Diseases: Proposal Modifications to the Voluntary Targets

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Abstract

World Health Organization member states gathered to draft the Global Action Plan for the prevention and control of noncommunicable diseases (NCDs). A global overarching target of a 25% reduction of premature mortality (between ages 30 and 70) from the four major NCDs (cardiovascular diseases, cancer, diabetes or chronic respiratory diseases) by 2025 was adopted. The primary aim of this mini-review is to identify the main barriers for reaching this plan using pertinent available evidence. The secondary aim is to reexamine the data with the dual purposes of amplifying beneficial effects of the voluntary global targets, and expanding the population to which they apply. This paper has identified five interrelated barriers: I) extremely low prevalence of ideal cardiovascular health, II) Gaps in affordability of essential medications, III) Gaps in health systems, IV) Low adherence to medications and V) Gaps in voluntary global targets. Conclusions: Modifications in the voluntary global targets are being proposed to produce greater effectiveness and extend reach. To this end, more ambitious risk factor targets for a larger proportion of the population and major efforts to strengthen healthcare systems are urgently needed.

Keywords: Noncommunicable disease; Hypertension; Cardiovascular risk; Cholesterol

Introduction

The cardiology community is in a pivotal position regarding prevention of the noncommunicable diseases (NCDs) in United States [1-3] and worldwide [4-7]. Recognizing that the rising burden of noncommunicable diseases (NCDs) World Health Organization member states gathered to draft the Global Action Plan for the prevention and control of NCDs. A global overarching target of a 25% reduction of premature mortality (between ages 30 and 70) from the four major NCDs (cardiovascular diseases (CVD), cancer, diabetes or chronic

respiratory diseases) by 2025 was adopted and the following nine voluntary global targets must be attained by 2025 [4-7].

- A 25% relative reduction in the overall mortality from cardiovascular diseases (CVD), cancer, diabetes type 2 (T2D), or chronic respiratory diseases.
- At least a 10% relative reduction in the harmful use of alcohol, as appropriate, within the national context.
- A 10% relative reduction in prevalence of insufficient physical activity.
- A 30% relative reduction in mean population intake of salt/sodium.
- A 30% relative reduction in prevalence of current tobacco use in persons aged 15+ years.
- A 25% relative reduction in the prevalence of raised blood pressure, or to contain the prevalence of raised blood pressure, according to national circumstances.
- Halt the rise in T2D and obesity.
- At least 50% of eligible people (defined as aged 40 years and older with a 10-year cardiovascular risk (CVR) \geq 30%, including those with existing CVD) receive drug therapy and counseling (including glycemic control) to prevent myocardial infarctions and strokes.
- An 80% availability of the affordable basic technologies and essential medicines, including generics, required to treat major noncommunicable diseases in both public and private facilities.

These four major NCDs were responsible for 82% of NCD deaths and also share some of the same risk factors including alcohol, tobacco, diet, and physical activity, which are included as distinct targets in the list of nine targets that is provided [3-8].

In 2015, an estimated 40 million deaths occurred due to NCDs, accounting for 70% of the overall total of 56 million deaths. More than 40% of them were premature deaths under age 70 years. Almost three quarters of all NCD deaths, and the majority of premature deaths (82%), occur in low- and middle-income countries. In low- and middle-income countries, a higher proportion (48%) of all NCD deaths are estimated to occur in

people under the age of 70 years, compared with high-income countries (28%) [3-8].

The majority of NCDs deaths were caused by CVD, 17.7 million deaths accounting for 45% of all NCD deaths [3-8]. Costs related to CVD representing 9% and 14% of the total healthcare expenditure across the European Union (EU) and United States of America (US) in each case [9,10]. It is evident success of the Global Action Plan will depend on progress in cardiovascular prevention. Since cardiometabolic risk, health, and outcomes dominate this topic, the following discussion is similarly focused. However, one must appreciate the "common soil" from which many NCDs originate, which encompasses component risk factors [6]. The commonality is shared etiologically, mechanistically, pathologically, and socioeconomically to a greater or lesser extent. For example, inflammation and oxidative stress are shared by patients with CVD, hypertension, cancer, T2D, metabolic syndrome, and chronic respiratory disease [4-6].

Governments, for the first time, are accountable for progress on NCDs and countries need to make progress on all these targets to attain the overarching target of a 25% reduction of premature mortality from the four major NCDs by 2025.

Aims of this Mini-Review

The primary aim of this mini-review is to identify the main barriers for reaching the Global Action Plan targets using pertinent available evidence based on CVD. The secondary aim is to reexamine the data with the dual purposes of amplifying beneficial effects of the voluntary global targets, and expanding the populations to which they apply.

Main barriers

Our review has identified five interrelated barriers.

Extremely low prevalence of ideal cardiovascular health

It is well known that lifestyle measures (weight control, increased physical activity, alcohol moderation, sodium restriction in individuals with high intake, increased consumption of fruits and vegetables, and dietary reduction in processed meats and added simple sugars) are key points in cardiovascular prevention [1,11].

A substantial proportion of deaths could be prevented or postponed with greater achievement of the 7 health metrics defined by American Heart Association (nonsmoking, body mass index (BMI) <25 kg/m², ≥ 150 minutes of moderately vigorous physical activity/week, a diet consistent with current guideline recommendations, untreated total cholesterol <200 mg/dL, untreated blood pressure <120/80 mmHg and untreated fasting glucose <100 mg/dL).¹ Even so, the prevalence of ideal cardiovascular health is abysmal. Less than 10% of participants in the community-based Heart Strategies Concentrating on Risk Evaluation (Heart SCORE) study met ≥ 5 of the 7 components of ideal cardiovascular health [12].

Most alarming, in the past decade there has been an unrelenting global rise in the prevalence of obesity and diabetes,

risk factors strongly associated with unhealthy lifestyles [13,14]. Throughout the lifespan, from the very young to the very old, the level of cardiovascular health is deteriorating, and the major reasons are also adverse health behaviors [15].

Unfortunately, the consumption of fruit and vegetables is inadequate worldwide, particularly in low-income countries, or in less-affluent people in higher income countries, and may be attributed to difficulties in both access and affordability [16]. A large proportion of low-income patients do not even have the resources to begin to implement favorable lifestyle changes [17].

In most countries challenged with reaching the Global Action Plan targets, assessing components of ideal cardiovascular health, even uncertain of whether the knowledge will ultimately improve outcomes, may be difficult. The Fuster-BEWAT (blood pressure [B], exercise [E], weight [W], alimentation [A], and tobacco [T]) score may prove useful in gathering similar information in the absence of laboratory access [18].

Gaps in affordability of essential medications

For over 30 years, mortality from coronary heart disease (CHD) has decreased substantially, with medical treatments accounting for about 45% of the reduction [13]. In the United States, however, in 2012 this trend reversed, and mortality began to rise, with possible negative implications for other countries [18]. This adverse change was likely due to the dual epidemics of obesity and T2D; the percentage of Americans meeting ideal levels for BMI and plasma glucose fell during the preceding 13 years, with attainment of an ideal diet essentially at 0% for the entire country [19].

Separately however, these data do not detract from the importance of needed, proven medications. In general, treatment for CVD has not been affordable in the majority of countries, particularly those with low-incomes. Combination therapy for CVD is largely unaffordable [20,21]. In lower-middle- and low-income countries, a 4-drug combination (aspirin, β -blocker, angiotensin-converting-enzyme inhibitor, and statin) for the secondary prevention of CVD was not affordable for 33% and 60% of households, respectively [20,21]. Even generic drugs that are low cost in high income countries, may be relatively (compared to income) expensive in low-middle income countries unless subsidized or provided free by governments [21].

It is not clear at this moment if the global voluntary target related to access to medications should be more ambitious because comprehensive estimates do not yet exist [3].

Gaps in health systems

Global Action Plan needs to be tailored taking into account the heterogeneity among countries in terms of health systems and local resources [6,10]. Allowing for the spectrum of health care delivery (centralized to private market designs) and variability in discretionary spending per capita, themes concerning preventive and self-care, socioeconomic influences, health system performance, access to health care and medications, physician knowledge and awareness about prevention, affordability, and adherence are all relevant to patient outcomes.

Traditional health systems are designed to address acute conditions, are more “reactive” to patient events as opposed to preventive, and are not structured optimally for the care of patients with chronic conditions. Primordial and primary disease prevention fostered by optimal self-care receives far less attention. Health services also usually operate in a fragmented way, and are more oriented to solve episodic problems than chronic conditions which require a care system operating in a harmonious, comprehensive and sustained fashion [15,22]. Time constraints may prevent healthcare providers from assessing psychosocial factors and as a result, behavioral counseling may not consistently be delivered to patients [15,22].

Low socioeconomic status, lack of social support, stress at work and in family life, hostility, depression, anxiety and other mental disorders contribute to the risk of developing CVD and worsen prognoses, whereas the absence of these stressors are associated with a lower risk of developing CVD and better prognoses. Psychosocial risk factors pose additional barriers to efforts to improve lifestyle, medication adherence, and health promotion at the individual and population levels [10].

The 2016 European Guidelines on cardiovascular prevention recommend that psychosocial risk factor assessment, using clinical interview or standardized questionnaires, should be considered to identify possible barriers to lifestyle change or adherence to medication in individuals at high CVD risk or with established CVD (class IIa, level B) [10].

Determinants of health have causal attributions of about 20%-30% for genes, 15%-20% for socioeconomic factors, 40% for individual health behaviors, 10%-15% for health care, and 5%-10% for properties of the physical environment [23]. Inadequate or unavailable medical therapy therefore contributes surprisingly little to health. In contrast, the predominant force of behavior exerts a 4-fold greater effect on well-being. Thus, it is clear that improving self-care at the individual, family, and community levels could produce a major impact in total health [15,22]. Resources and effort should be allocated accordingly, but this is not the case. Adverse health behaviors are most prevalent among those with low socioeconomic status, little education, and limited access to health cares, thereby amplifying the jeopardies of disparities [24-26].

The most effective interventions are tailored to individual patient needs, use multiple components to improve self-management outcomes, and often employ multidisciplinary approaches [26].

Other considerations include the boundaries and strengths of governmental restrictions and mandates to improve all modifiable risk factors. Such decisions might take into account the successful control of tobacco after the implementation of the WHO Framework Convention on Tobacco Control [10]. There is little question that for many cardiovascular risk factors, the transition to a culture of health will require courageous and innovative legislative support that will vary regionally.

Low adherence to medications

In order to reduce premature mortality of CVD, it is not enough to improve indications, affordability and availability of

evidence-based drugs, but it is also necessary to recognize the remaining dimensions of access to medicines such as accessibility, acceptability (including patient adherence) and quality of medicines [20]. Unfortunately, medication adherence is below 50% in high-risk patients, which is a major cause of preventable premature mortality [21]. The causes of non-adherence to drugs are multifactorial, and can be divided into the following classical categories:

- Socioeconomic factors (income, education, cost of medications) (affordability).
- Health care system-related (eg, accessibility and availability).
- Medical condition-related (comorbidities, cognitive impairment).
- Therapy-related (medication regimen, lack of immediate discernible changes, unpleasant side effects).
- Patient-related psychological-behavioral factors, such as perceived risk, fear, motivation, depression, anxiety, and hopelessness [27].

When they exist, the relationships among patient cost-sharing strategies (deductibles, copayments, caps) disposable income, and adherence are complex [28,29]. While copayments or higher costs may explain some impairment in adherence, the effect is variable. Moreover, in venues where there is no patient cost, adherence may be as low as in others with a spectrum of cost sharing amounts [30]. There is some suggestion a threshold effect may exist [28,30]. Relative contribution of patient cost in relation to the many other factors responsible for poor adherence is also heterogeneous. As a result, there is some controversy about the impact of medication cost per se, but not adherence, upon unwanted events and outcomes [30]. What can be concluded is that attempts of insurers to reduce their own medication expenses may result in poor adherence, which ultimately may be self-defeating when complications arise from unavailability of proven therapies [28].

Gaps in voluntary global targets

The four major NCDs included in the Global Action Plan do not comprise 100% of all premature deaths, and other NCDs were responsible for approximately 24% of NCD deaths under the age of 70 years. The relatively close deadline (by 2025) of the Global Action Plan against the prolonged course of illness of NCDs.

Serum cholesterol was not included among the voluntary global targets and statins can be, depending upon patient circumstances, a most effective pharmacological component in cardiovascular prevention. The HOPE-3 (Heart Outcomes Prevention Evaluation-3) trial demonstrated a significantly lower rate of cardiovascular events in intermediate-risk subjects without overt CVD when treated with the combination of rosuvastatin and candesartan/hydrochlorothiazide as compared with dual placebo. Benefits associated with this combination were observed in all low-density lipoprotein cholesterol (LDL) tertiles: (i) LDL \leq 112.3 mg/dL (mean=89.1), (ii) LDL 112.4-141.7 mg/dL (mean=126.8), and (iii) LDL >141.7 mg/dL (mean=166.7) [14,31]. In fact, in the overall management of CVR, the ABC criteria (where A, B, and C respectively refer to A1C for blood glucose, blood pressure, and cholesterol) are widely used in clinical practices. Achieving a greater number of ABC targets,

irrespective of the patient's characteristics, incrementally reduced the risk of total cardiovascular disease (CVD) and all its subtypes including coronary heart disease, stroke, and heart failure [32].

Patients with a 10-year CVR <30% are not eligible for receiving drug therapy and counseling to reach targets. Nevertheless, two-thirds of total CVD events occur in subjects with low to moderate absolute CVR, and this proportion may approach three-quarters in women [14].

For a further substantial contribution to risk reduction, more ambitious risk factor targets will be needed to address control of fasting plasma glucose and BMI [33]. According to a modeling study from the American Heart Association and World Heart Federation [3], this study also emphasized regionally-specific global risk factor targets, with the largest effect size noted for limiting BMI increases in some high-income countries [3].

Ideal management of the NCDs could be unreachable for low-income countries and less-affluent people in higher income countries [14].

Recently, the First International Consensus on mild hypertension with low to moderate CVR process identified several elements that favor early antihypertensive pharmacological treatment in all patients without low absolute and relative total CVR, and recommended that statins should be considered along with blood-pressure lowering therapy,

irrespective of cholesterol levels, in patients with grade 1 hypertensive with moderate CVR. This same Consensus highlighted limitations of absolute CVR and the estimation advantages of using relative total CVR [14]. New hypertension guidelines from the American Heart Association and 10 other medical groups reduced the hypertension threshold from 140 mmHg systolic over 90 mmHg diastolic to 130 over 80 [34]. As a result, dynamics of treatment will change considerably, and will eventually produce positive outcomes. The new guidelines maintained an emphasis upon lifestyle measures; full implementation will, however, still face many barriers that currently exist.

Discussion and Conclusion

There are critical barriers for reaching the Global Action Plan targets. Voluntary global targets could be unreachable for low-income people. Modifications in the voluntary global targets are being proposed to produce greater effectiveness and extend reach. To this end, more ambitious risk factor targets for a larger proportion of the population and major efforts [35,36], to strengthen healthcare systems are urgently needed.

The continuous follow-up of Global Action Plan could lead to reassessment of the ideal targets to bring them closer to accomplishing the 25% reduction of NCD premature mortality by 2025 (Table 1).

Table 1: Comparison between current global voluntary targets and the ideal proposal targets.

Current targets	Ideal targets
Apply to patients with CVD or patients without CVD but 10-year CVR \geq 30%.	Apply to all patients with CVD or patients without CVD but at moderately-high absolute or relative total CVR [11].
Consider five main risk factors (hypertension, tobacco, physical inactivity, salt and alcohol excess).	Consider more aggressive targets against all major risk factor (including obesity and T2D) [3,11,27].
Take into account 2 health system dimensions of access to medicines	Take into account all health system dimensions of access to medicines [17].
Include legal regulations against tobacco use.	Include legal regulations modifying all uncontrolled modifiable risk factors.

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