Prevention of Disease-related Mortality from Chronic Non-communicable Diseases

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Abstract:

The disease-related mortality from chronic non-communicable diseases is an emerging issue of global health in middle to high income countries. Cardiovascular and cerebrovascular diseases, chronic obstructive pulmonary disease, dementia and diabetes mellitus are of special concern. Over time, the major risks undergone transition from the traditional to the modern ones. Although the major health risks are considered global, their geographic variations must be taken seriously into account when planning preventive strategies for specific countries or regions.

Introduction:

The disease-related mortality accountable to chronic non-communicable diseases (NCD) constitutes an increasing burden for public health, social and financing systems worldwide. If looking at the WHO ranking (2018) of leading 10 death causes (see Figure 1), it is striking that 6 of them belong to non-communicable diseases (ischaemic heart disease, stroke, chronic obstructive pulmonary disease, Alzheimer disease and other dementias, respiratory cancers and diabetes mellitus). Moreover, the top 2 NCD (ischemic heart disease and stroke) are permanent unbeatable leaders of the chart since decades (1-16). Alone cardiovascular diseases killed 17.65 million people in 2015 according to the WHO statistics. The time dynamic of some other NCD over last 15 years shows a remarkable progression however. For instance, deaths from diabetes increased from 1.0 million to 1.6 million and deaths from dementia doubled. The financial impact of NCD is permanently growing on one side and unmasking insufficiency, inefficacy and inequity of most financial schemes on the other side. According to the estimations of World Bank (2019) 20% to 40% of health spending is wasted, whereas the healhtcare spending pushes people into extreme poverty at the same time. (17-25)

Chronic Non Communicable diseases

All chronic NCD are truly global: they have impact around the entire world and affect countries from high, middle and low income groups. On the same instance they all have known health risks which can be defined as factors that raise the probability of adverse health outcomes. The top 5 worldwide leading health risks are currently high blood pressure, tobacco use, high blood glucose, physical inactivity, overweight and obesity according to the WHO Global Health Risk Report (2009). Considerably enough all of them belong to the so called „modern risks" as compared to the traditional ones (Figure 2). Apart from inherited genetic/biological constitution there are 4 important sets of determinant conditions (health behavior, clinical care, social and economic factors, physical environment) that influence individual and public health (Figure 3). Each of these four cardinal sets consists of manyfold specific entities which may be addressed by health policies, programs and interventions aimed to improve major health outcomes (length of life and quality of life). Consequently, most of the NCD may be prevented by appropriate prevention methods (5-10).

Figure 1. Top 10 diseases attributable to worldwide mortality.

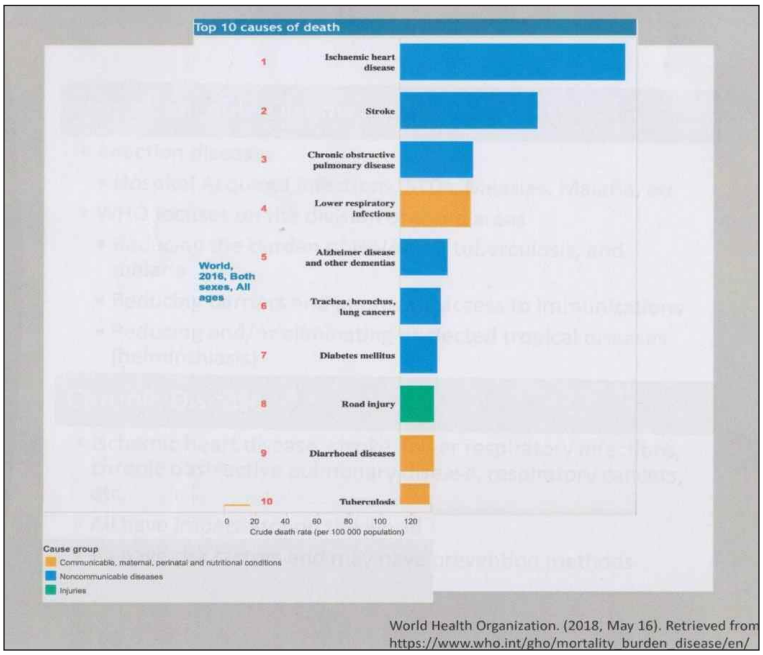
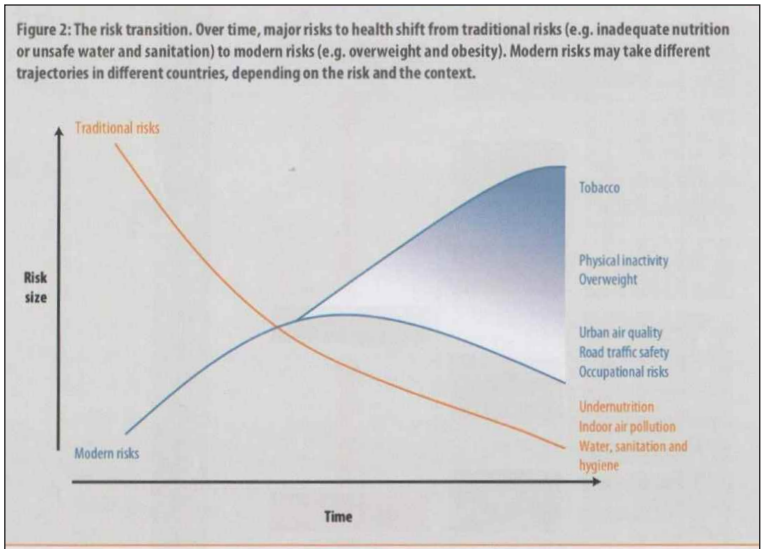
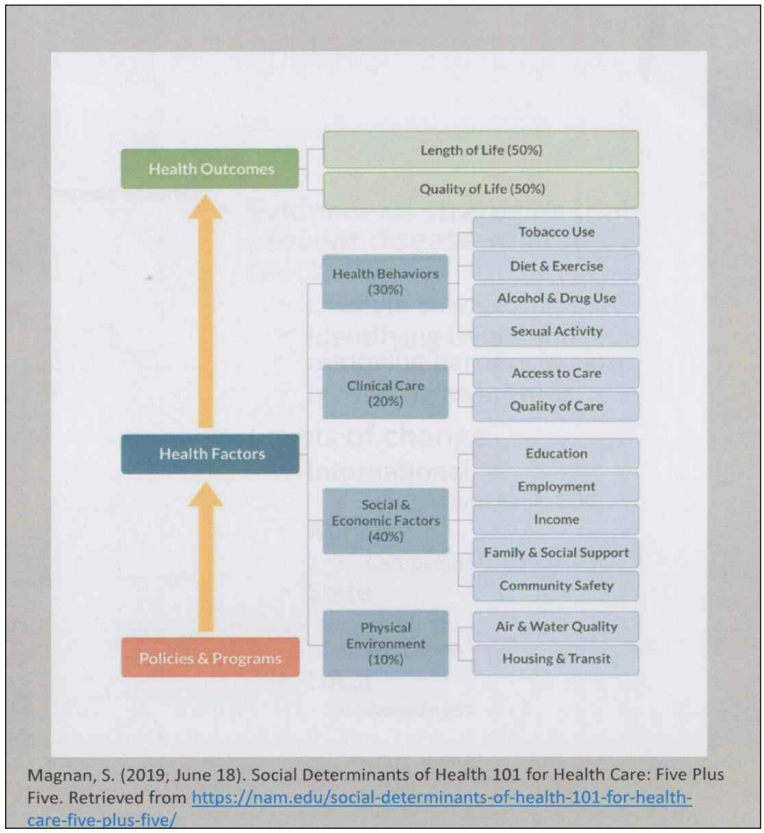


Figure 2. The risk transition



Global Health Risks: Mortality and burden of disease attributable to selected major risks. (2009). Retrieved from https://www.who.int/healthinfo/global_burden_disease/GlobalHealthRisks_report_full.pdf

Figure 3. Sets of preventable health determinants.



Magnan, S. (2019, June 18). Social Determinants of Health 101 for Health Care: Five Plus Five. Retrieved from https://nam.edu/social-determinants-of-health-101-for-health-care-five-plus-five/

Prevention strategies

When it comes to prevention strategies, there is a lot of evidence on their effectiviteness, whether they are striving for lifestyle changes, identifying issues and removing barriers to care or just increasing awareness. The impact level of individual preventive tools may however differ depending on their characteristics. Typically, the global impacts are managed and assessed by renowned international agencies such as WHO, World Bank or CDC. Campaigns at a national level are funded and executed by dedicated state agencies. Table 1 presents an authors overview of internationally proven prevention strategies and their risk influences.

Although displaying common global characteristics, there are certain specific differences in NCD resulting from socio-geographic variations of various communities and countries. The most developed countries such as Australia, Germany or United States tend to show higher prevalence of substance abuse with consequent obesity, diabetes, cardiac diseases, cancer and mental health problems, whereas the emerging/developing countries like Mexico, Romania or Brazil suffer from environmental pollutions (unsafe water, indoor smoke, malaria, air pollution, road traffic, lead exposure and others) and low average education level. The underdeveloped countries such as Afghanistan, Chad or Nepal are devastated by health inequality, as well as deficit of knowledge and services (Brown 1966, Orach 2009). Improved sanitation may serve as a demonstration of progress in some developing countries (Gutiérrez 2015) over last 25 years (Figure 4).

An example of structurally elaborated preventive actions against cardiovascular recurrence and mortality is shown on Figure 5 As clearly depicted, the means of primordial prevention are complemented by targeted interventions within realms of primary and secondary prevention.

Conclusion

Health policies and programs should be forward looking, while having an anticipative vision with clear focus on prevention. Settling on current conditions may assure only limited actual improvement but not ensuring sustainable development. To ensure efficacy of preventive interventions, a reasoned redistribution of public resources may be necessary. Ensuring systematic access to education, healthy environment and healthcare services is crucial to achieve best possible health outcomes.

Table 1. Overview of proven prevention strategies.

Dietary and lifestyle factors	CVD	Type 2 diabetes	Cancer	Dental disease	Fracture	Cataract	Birth defects	Obesity	Metabolic syndrome	Depression	Sexual dysfunction
Avoid smoking	↓	↓	↓	↓	↓	↓		↑			↓
Pursue physical activity	↓	↓	↓		↓			↓	↓	↓	↓
Avoid overweight	↓	↓	↓		↑	↓			↓		↓
Diet											
Consume healthy types of fats[a]	↓	↓							↓		
Eat plenty of fruits and vegetables	↓		↓		↓	↓	↓	↓			
Replace refined grains with whole grains	↓	↓						↓	↓		
Limit sugar intake[b]	↓	↓		↓				↓	↓		
Limit excessive calories								↓	↓		
Limit sodium intake	↓										

Source: Authors' summary of a review by the WHO and FAO 2003; Bacon and others 2003; Fox 1999; IARC 2002.

Note: Bold = convincing; Standard = probable relation; ↑ = increase in risk; ↓ = decrease in risk.

a. Replace trans and saturated fats with mono- and polyunsaturated fats, including a regular source of N-3 fatty acids.

b. Includes limiting sugar-based beverages.

Figure 4. Evolution of sanitation availability in Mexico.

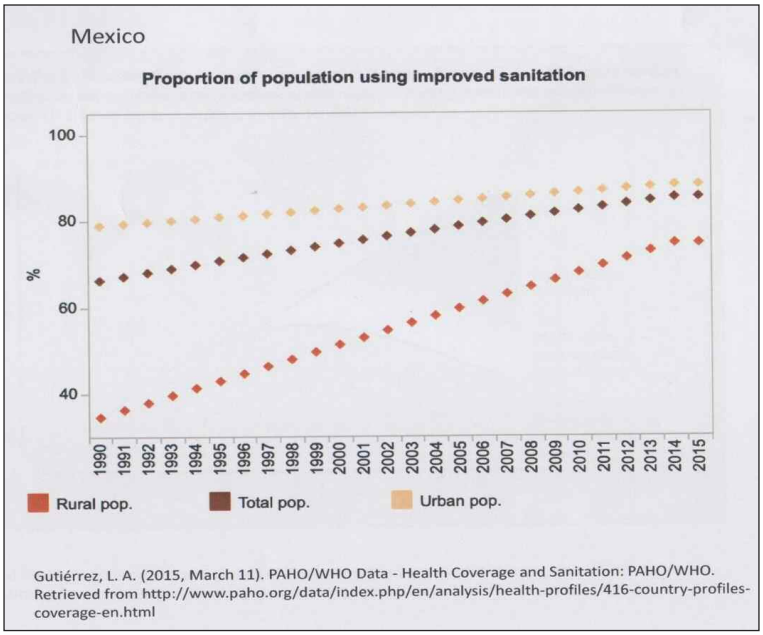


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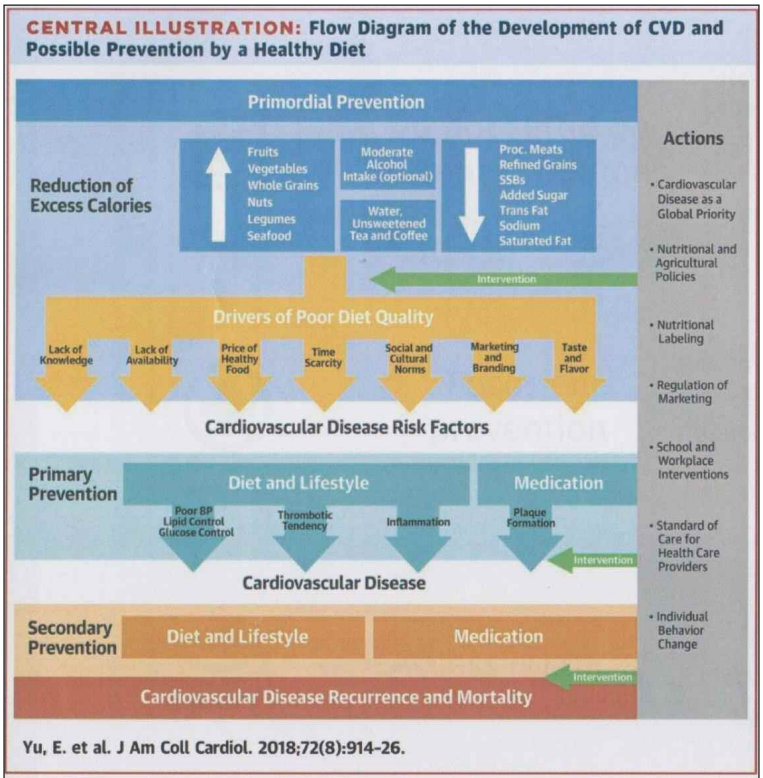
Figure 5. Structured actions in preventing cardiovascular diseases.



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