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# Chronic diseases: the emerging pandemic.

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According to the 2011 World Health Organization Global Status Report, of the 57 million annual global deaths – a staggering 36 million or over 63% are due to chronic diseases.<sup>1</sup> Four noncommunicable diseases - namely cardiovascular, cancer, diabetes, and chronic respiratory diseases - emerge as the leading cause of mortality in the world, accounting respectively for 17, 7.6, 4.2, and 1.3 million deaths based on the latest available global epidemiology data. By 2020, global deaths due to chronic diseases are projected to worsen by at least 15 to 20%. It is estimated that the four major noncommunicable diseases will be responsible for 75% of worldwide deaths by 2030.<sup>2</sup>

Progress to date on noncommunicable diseases has been vastly inadequate at global scale, resulting in a rampant pandemic. As described by the World Health Organization Director-General Margaret Chan, “The rise of chronic noncommunicable diseases presents an enormous challenge. For some countries, it is no exaggeration to describe the situation as an impending disaster; a disaster for health, for society...”<sup>3</sup>

Alarming, across all continents (with the exception of Africa), deaths from noncommunicable diseases now exceed those from communicable, maternal, perinatal and nutritional conditions combined. For men in Europe, for example, deaths from noncommunicable diseases are 13 times higher than other causes combined, and for men in the Western Pacific region, they are 8 times higher. Remarkably, the burden of

chronic diseases is rising disproportionately among lower income countries and populations, with nearly 80% of noncommunicable disease-associated deaths reported in low- and middle-income countries.<sup>1-3</sup>

Chronic diseases are an under-appreciated cause of poverty that hinders the economic development around the world. The burden is growing - the number of people, families and communities afflicted is increasing. Noncommunicable diseases stand as a major barrier to achievement of the anti-poverty Millennium Development Goals, with urgent action required to integrate management of chronic diseases into global health priorities.

Tackling the global noncommunicable diseases crisis requires a concerted and coordinated multi-sectorial response, committed across societies at large. This requires adapting health systems and health policies, and a shift from disease-centered to people-centered approaches and population health measures. Vertical initiatives are insufficient to meet complex population needs, so integrated solutions that engage a matrix of disciplines and sectors are needed.<sup>1-3</sup>

Evidence-based and cost-effective interventions exist to prevent and control the threat of chronic diseases at global, regional, national and local levels. Modifiable risk factors, including tobacco, harmful use of alcohol, unhealthy diet, insufficient physical activity, obesity, as well as hypertension, hyperglycemia and hypercholesterolemia are recognized

as major contributors to the underlying pathobiology of chronic disease processes.<sup>1-5</sup> Comprehensive and integrated action at country/continent level is thus mandatory to advance solutions in order to prevent morbidity and disability. To this end, implementation of the World Health Organization Action Plan for the Global Strategy for the Prevention and Control of noncommunicable diseases, the Global Strategy on Diet, Physical Activity and Health, and the Global Strategy to Reduce the Harmful Use of Alcohol are all vital initiatives.<sup>1-3</sup>

Establishment of a United Nations 2012-2022 Decade of Action on Noncommunicable Diseases has been advocated to ensure that 85% of the world's population has access to information, education and services to reduce vulnerability and death rates associated with chronic diseases. In this context, the Noncommunicable Diseases Alliance, steered by the International Diabetes Federation, the International Union against Tuberculosis and Lung Disease, the Union for International Cancer Control and the World Heart Federation, and representing over 900 professional member organizations in 170 countries, has been at the forefront of advocacy.<sup>6</sup> Recommendations, at worldwide scale, include promotion of population-wide prevention, early detection, screening, and awareness-raising programs for noncommunicable diseases targeting populations at risk. This would include by 2013, development and implementation of regulatory measures to achieve substantial reductions in levels of

saturated fats, trans-fats, salt and refined sugars in processed foods, as well as to reduce worldwide salt intake.<sup>6</sup> By 2018, the goal is to decrease mortality and morbidity of cardiovascular diseases, diabetes, as well as gastric, colorectal, breast, and cervical cancer by increasing early detection, implementing immunization strategies for human papillomavirus and hepatitis B virus for populations at high risk, and globally reducing environmental, occupational and contextual risk factors associated with noncommunicable diseases.<sup>6</sup> Ensuring universal access to affordable, safe and effective, quality noncommunicable diseases diagnosis and treatment, and further strengthening of national and community-based health systems to enable continuity of care are indeed paramount.

Transforming community and global health would further require accelerated fundamental research to acquire new knowledge on disease causes and cures, integrated across an effective translational continuum of prevention, treatment and management for the spectrum of chronic disease conditions.<sup>7</sup> Leveraging discovery to the benefit of patients and populations encompasses multiple integrated steps.<sup>8,9</sup> By addressing a global unmet need, initial discovery science leads to development and evaluation of candidate health applications, followed by validation and prescription of evidence-based recommendations for clinical practice and health decision-making, and finally patient-centric

translation which strives to disseminate health care interventions integral to community practices.<sup>8-12</sup> Advancing the medical model of 'intervention' into the public health model of disease management or 'prevention' ultimately enables prevention and behavioral alterations in communities and populations.<sup>8,9</sup> The public health model focuses on information and education programs that eliminate deleterious behaviors at the community and population levels, associated with improved disease prevention and reduced costs for medical care. The impact of these paradigms must extend beyond individual communities, to translate the maximum benefits of scientific and medical innovation to populations at large. In this context, the public health model of care evolves into the social health model, which focuses on improving the health of populations by reforming suboptimal social structures enabling adequate distribution of the products of scientific innovation to those global populations in greatest need.<sup>8,9</sup>



## REFERENCES

1. World Health Organization. Global status report on noncommunicable diseases 2011. [http://www.who.int/nmh/publications/ncd\\_report2010/en/](http://www.who.int/nmh/publications/ncd_report2010/en/)
2. World Health Organization. Global Health Observatory 2011. <http://www.who.int/gho/ncd/en/index.html>
3. World Health Organization. New WHO report. April 27, 2011. [http://www.who.int/mediacentre/news/releases/2011/ncds\\_20110427/en/index.html](http://www.who.int/mediacentre/news/releases/2011/ncds_20110427/en/index.html)
4. Valentino MA, Terzic A, Waldman SA. Sizing up pharmacotherapy for obesity. *Clin Transl Sci.* 2010 Jun;3(3):123-5.
5. Waldman SA, Terzic A. Individualized medicine and the imperative of global health. *Clin Pharmacol Ther.* 2007 Nov;82(5):479-83.
6. The NCD Alliance. Putting non-communicable diseases on the global agenda. <http://www.ncdalliance.org/aboutus>
7. Waldman SA, Terzic A. Translational medicine in the era of health care reform. *Clin Transl Sci.* 2009 Apr;2(2):96-7.
8. Waldman SA, Terzic A. Clinical and translational science: from bench-bedside to global village. *Clin Transl Sci.* 2010 Oct;3(5):254-7.
9. Terzic A, Waldman SA. Translational medicine: path to personalized and public health. *Biomark Med.* 2010 Dec;4(6):787-90.
10. Waldman SA, Terzic A. Clinical translational science 2020: disruptive innovation redefines the discovery-application enterprise. *Clin Transl Sci.* 2011 Feb;4(1):69-71.
11. Waldman SA, Terzic A. Molecular therapy drives patient-centric health care paradigms. *Clin Transl Sci.* 2010 Aug;3(4):170-1.
12. Waldman SA, Terzic A. Molecular therapeutics from knowledge to delivery. *Clin Pharmacol Ther.* 2010 Jun;87(6):619-23.