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Original Research

A paradigm shift for socioeconomic justice and health: from focusing on inequalities to aiming at sustainable equity

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ABSTRACT

Objectives: To measure the 'best possible health for all', incorporating sustainability, and to establish the magnitude of global health inequity.
Study design: Observational, retrospective.
Methods: We identified countries with three criteria: (1) a healthy population—life expectancy above world average; (2) living conditions feasible to replicate worldwide—per-capita gross domestic product (GDP-pc) below the world average; and (3) sustainability—per-capita carbon dioxide emissions lower than the planetary pollution boundary. Using these healthy, feasible, and sustainable (HFS) countries as the gold standard, we estimated the burden of global health inequity (BGHiE) in terms of excess deaths, analyzing time-trends (1950–2012) by age, sex, and geographic location. Finally, we defined a global income 'equity zone' and quantified the economic gap needed to achieve global sustainable health equity.
Results: A total of 14 countries worldwide met the HFS criteria. Since 1970, there has been a BGHiE of ~17 million avoidable deaths per year (~40% of all deaths), with 36 life-years-lost per excess death. Young children and women bore a higher BGHiE, and, in recent years, the highest proportion of avoidable deaths occurred in Africa, India, and the Russian Federation. By 2012, the most efficient HFS countries had a GDP-pc/year of USD$2,165, which we proposed as the lower equity zone threshold. The estimated USD$2.58 trillion economic gap represents 3.6% of the world's GDP—twenty times larger than current total global foreign aid.
Conclusions: Sustainable health equity metrics provide a benchmark tool to guide efforts toward transforming overall living conditions, as a means to achieve the 'best possible health for all.'

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Introduction

Although the focus of the World Health Organization (WHO) on health inequalities[1] and on the measurement of the social determinants of health[2] has been a step forward in recognizing the central role that socioeconomic conditions play in the health status of individuals and populations, it has also contributed to further fragmentation in global health standards and interventions.[3] This fragmentation limits the transition from random mitigating interventions to universal transformational policies needed to provide the living conditions that allow all people to lead a healthy, feasible and sustainable life. Inequalities,[4] or 'any mathematical differences or ratios', are not synonymous with inequities, which are 'unfair differences'[5,6] (Table 1). Equity also includes the concept of ecological sustainability, or intergenerational fairness in the use of resources, i.e., the responsibility to manage planetary resources for generations to come as others have analyzed in greater depth.[7]

The WHO's lofty, yet nonspecific, constitutional objective of 'the attainment by all peoples of the highest possible level of health',[8] the only common global health objective of all nations,[9] remains unmeasured, rendering the goal unenforceable. We propose a method to identify those standards while adding the dimension of sustainability to the WHO's constitutional goal,[10] to determine health equity standards that are feasible to achieve with the economic means available, are sustainable in the use of natural resources over time, and are applicable to all human beings. These feasible and sustainable global health equity standards allow quantification of the burden of health inequity between and within countries and provide estimates of the economic resources needed to close current gaps in inequity.

Methods

Data sources

To identify feasible and sustainable global health standards, we utilized average national data from the World Bank database from all years available: 1960–2012.[11] These data sets include worldwide country-level health, socioeconomic, and development indicators. After running correlations among commonly used indicators, we decided to include in our study life expectancy at birth (LE), as a proxy for overall health; constant-value per-capita gross domestic product (GDP-pc[c]), to identify living standards that can be scaled globally (feasibility) and fossil-fuel consumption carbon dioxide equivalent emissions per capita (COe_2-pc) as a surrogate measure of ecological sustainability,[d] acknowledging that it is only one of the planetary boundaries of sustainability.[12]

Analysis

Subsequently, we identified countries that fulfilled three criteria, as compared with world weighted-averages: (1) higher LE (healthier); (2) lower GDP-pc (feasible to replicate); and (3) CO_2e-pc equivalent emissions below the planetary recycling boundary (sustainable). We designated these countries as having healthy, feasible, and sustainable (HFS) global health equity standards. The correlation with underlying socioeconomic factors, however, remains to be studied. Subsequently, we utilized age (5-year age groups up to 80 years of age) and sex-specific all-cause mortality rates of the HFS-model countries, from the United Nations Demographic Statistics Division,[13] as global mortality-rate standards. By applying these global health equity standards to population figures of each country, we compared the observed and expected number of deaths in each country, estimating the excess mortality if socioeconomic conditions were at least those of the countries in the HFS model. We defined this excess mortality as the burden of global health inequity (BGHiE). We examined the distribution of the BGHiE by country, sex, and age group. We also examined temporal trends in BGHiE using 5-year annual averages from 1950 to 2010. These analyses were repeated estimating the proportion of excess mortality (hereafter defined as 'avoidable deaths') from all deaths below 80 years of age,[14] number of life-years-lost, and survival pyramids.[15]

Subsequently, based on the GDP-pc of the HFS countries, we calculated the economic threshold necessary to be able to achieve the proposed global health equity standards. Under the feasible and sustainable global health equity principle, we assigned the weighted-average of the countries that during the study period had the lowest GDP-pc among the HFS countries as the lower income threshold to enable HFS standards. Knowing the weighted-average world GDP-pc, and assuming a theoretical normal distribution, we then estimated the symmetric upper limits of GDP-pc to define an 'equity zone', namely the area of the GDP-pc distribution contained between the lower and upper thresholds. We then estimated the threshold level of GDP-pc above which, the cumulative excess GDP, if redistributed, would suffice to fill the deficit of those counties under the equity zone lower thresholds. We call that limit the 'excess accumulation threshold.'

Finally, for every year from 1960 to 2012, we determined the distribution of countries and total population in each of the following categories: below, within, and above the equity zone, the latter divided into two subcategories, above and below an 'excess accumulation' threshold. By applying the global health equity standards, we then calculated the redistribution of GDP-pc, the number of avoidable deaths, and the proportion of all deaths that would be avoided in every country according to equity zone categories.

[c] GDP-pc constant value GDP at purchaser's prices as the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. Data are in current U.S. dollars and are converted from domestic currencies using single year official exchange rates. The data on GDP-pc at purchasing power parity were not available for all countries during the study period, and there is significant controversy on the methodology and interpretation: see: www.oecd.org/std/na/1960906.doc.

[d] CO_2 emissions per capita are estimated from the production source and underestimate the effect (by demand) and responsibility of the consumption end.