



ELSEVIER

Contents lists available at ScienceDirect

Global Food Security

journal homepage: www.elsevier.com/locate/gfs

Rethinking the measurement of undernutrition in a broader health context: Should we look at possible causes or actual effects?

Alexander J. Stein ¹

International Food Policy Research Institute, Washington, USA

ARTICLE INFO

Article history:

Received 22 December 2013

Received in revised form

1 September 2014

Accepted 2 September 2014

Keywords:

Hunger

Food Security

Measurement

Disability-adjusted life years

Global burden of disease

Costs

ABSTRACT

When measuring food and nutrition security, focusing on proxy indicators such as food availability, or on selected head count figures such as stunting rates, gives an incomplete picture. Outcome-based global burden of disease (GBD) studies offer an alternative for monitoring the burden of chronic and hidden hunger. Judging by this measure, the international goal of halving global hunger between 1990 and 2015 has already been achieved.

Disability-adjusted life years (DALYs) that are used as metric in GBD studies can be converted into more easily understood monetary terms. The resulting estimate of the annual cost of global hunger of up to 1.9 trillion international dollars may be better suited to illustrate the magnitude of the remaining problem.

© 2014 Elsevier B.V. All rights reserved.

1. Introduction

In recent years—after the 2007/08 food price crisis and more recently in the context of discussions about the post-2015 development agenda—interest in food and nutrition security and its quantification resurged (Barrett, 2010; Coates, 2013; De Haen et al., 2011; FAO, 2011, 2013d; Headey and Ecker, 2013; Masset, 2011; Pinstrup-Andersen, 2009; UN, 2013b). In this context a host of new food and nutrition security indexes have been launched (GAIN, 2013; Muthayya et al., 2013; Stein, 2013c; Te Lintelo et al., 2013) and the Food and Agriculture Organization (FAO) revised the methodology and data it uses to estimate the number of undernourished people in the world (FAO, 2012b). At the same time increasing attention is paid to nutrition and its connections to agriculture and health (Horton and Lo, 2013; Pandya-Lorch et al., 2012; UK, 2013).

In this context it is pertinent to recall why we are concerned about hunger and malnutrition: because of the negative consequences it has for people's health and well-being. Food and nutrition insecurity is usually defined in terms of what determines hunger, namely the lack of availability of, access to and utilization of food (Box 1). However, to measure hunger, I contend that the

outcome of food and nutrition insecurity, i.e. the burden of disease that is caused by hunger, should be used (Fig. 1).

While there are numerous suggestions for measuring hunger, probably the single most important indicator is the FAO's estimate of the proportion of undernourished people worldwide, not least because it is also used to measure progress toward the first Millennium Development Goal (MDG). What the FAO's indicator really measures, though, is mostly changes in food availability (FAO, 2012a). That is, the indicator focuses on only one of the determinants of undernutrition, and it looks only at the household level. Moreover, being a head count indicator, this measure fails to take into account the depth of undernutrition. In contrast to such indicators that focus on the "input" side of hunger, I argue that what might matter more for measuring the burden of undernutrition are actual outcomes, namely the amount of ill health and related welfare losses that are caused by hunger in all its forms. Therefore, this paper looks through a public health lens and uses data and methodologies from that field to measure undernutrition—an approach that can be enlarged and improved upon in the future.

Obviously, this is not to say that the availability of and access to adequate food do not matter or that related determinants that capture different aspects of food security should not be better understood, but I argue that if the interest is knowing the size of the hunger problem, then measuring the outcome of hunger is what matters more. Then, once the magnitude of the problem is thus determined, the results can be used to validate input measures—and if their results are sufficiently correlated they

E-mail address: contact@ajstein.de¹ At the time of writing this paper the author was working at IFPRI.

might then be used as proxy measures for hunger or to gauge the breadth of a problem.

2. Using DALYs to measure the burden of undernutrition

One challenge when trying to measure health outcomes of undernutrition is the multitude of adverse health consequences that can be attributed to hunger, in particular to micronutrient deficiencies: bouts of diarrhea, pneumonia, or measles in children that last days; night blindness in pregnant and lactating women that lasts months; stunting, mental retardation, or blindness in children that is irreversible and lasts their entire lives; or child mortality in the worst cases (Stein et al., 2005). Therefore the question is whether health can be measured in a consistent way across such diverse outcomes.

To make the burden imposed by different health outcomes comparable, 20 years ago the World Bank introduced the concept of disability-adjusted life years (DALYs) (World Bank, 1993). In this approach, different health states are weighed according to their respective severity before their durations are added up to obtain a burden of disease, which is expressed as an overall loss of what amounts to healthy life-year equivalents. Put differently, DALYs measure “person-years lost in a population owing to disability and shortened life” (Editorial, 2013). In its most general form, the DALYs formula can be represented as

$$DALYs_{\text{lost}} = YLL + YLD_{\text{weighted}}, \quad (1)$$

where YLL are “years of life lost” due to premature mortality and

Box 1

According to the FAO (FAO, 2013a), *undernutrition* is “the result of prolonged low levels of food intake and/or low absorption of food consumed. Generally applied to energy (or protein and energy) deficiency, but it may also relate to vitamin and mineral deficiencies,” whereas *undernourishment* or *chronic hunger* is limited to shortfalls of dietary energy, namely to “the status of persons whose food intake regularly provides less than their minimum energy requirements.” Hence, undernutrition comprises not only chronic hunger but also micronutrient deficiencies, which are sometimes called *hidden hunger*. For the purpose of this paper hunger is understood to be synonymous to undernutrition.

YLD are weighted “years lost due to disability,” which are summed up across all target groups and health outcomes of interest.

Since its introduction, the DALYs concept has been popularized by the World Health Organization (WHO, 2013b) – like the FAO a specialized agency of the United Nations – and the methodology has been expounded in a seminal book by (Murray and Lopez, 1996). Since then, DALYs have become a metric that is used widely for assessing the consequences of adverse health outcomes or to carry out cost-effectiveness analyses (Fox-Rushby, 2002; Glassman and Chalkidou, 2012). In particular, DALYs have been used to determine the burden of various forms of *hidden hunger* or to assess the potential impact and cost-effectiveness of related micronutrient interventions (Ma et al., 2008; Meenakshi et al., 2010; Sandler, 2005; Stein et al., 2006, 2007a; Stein et al., 2008; Zimmermann and Qaim, 2004).

The WHO used DALYs to quantify the global burden of disease (GBD), for which it reported results at the country level and for a range of health outcomes (WHO, 2013a). Based on these readily available data, DALYs can be used to quantify the global burden of hunger without requiring additional investments in data collection. This is what this paper does, following the literature to attribute health outcomes to undernutrition (Stein et al., 2009, 2005).

Aggregating DALYs lost due to these various health outcomes (and using 2011 population figures to generate DALYs estimates for 2011 from the WHO's data for 2004) yields results for the burden of hunger in terms of DALYs lost in 2011 at the global and country level (Table S.1 in (Stein, 2013b)). Based on these WHO data, the estimates indicate that globally 44 million DALYs are lost due to micronutrient malnutrition and 21 million DALYs are lost due to undernourishment. The same individual can be both undernourished and suffering from one or another micronutrient deficiency, but in the calculation of DALYs the various health outcomes are clearly differentiated by cause; that is, DALYs lost are summable (which is one of their conceptual strengths). Therefore, added together, the global burden of hunger in all its forms amounts to 65 million DALYs lost—about 4 percent of the total burden of disease.

For comparisons of the burden of hunger across countries, the loss of DALYs due to undernutrition can be assessed using absolute or relative figures. Given India's huge population and relative poverty, the biggest absolute burden of hunger can be found in that country. However, if the loss of DALYs is expressed in per capita terms, it is mostly countries in Africa south of the Sahara that fare poorly (see Table S.1 in (Stein, 2013b)).

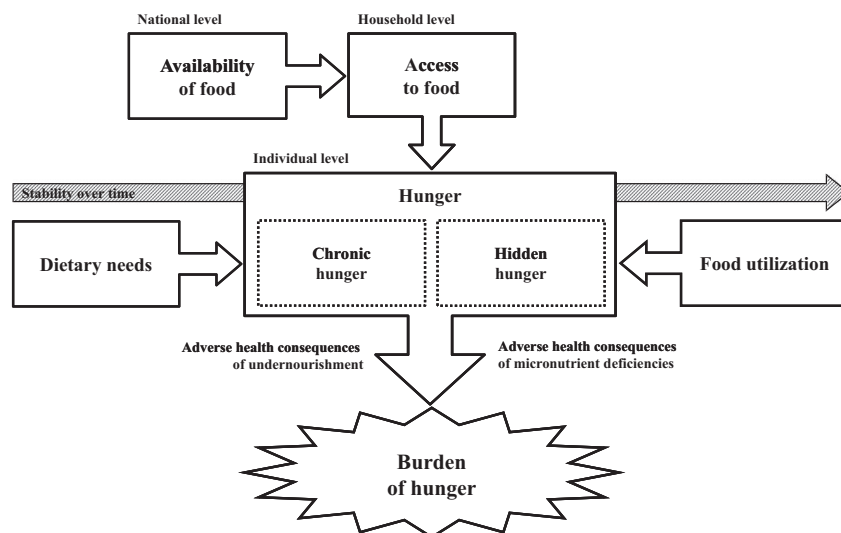


Fig. 1. Food and nutrition insecurity and the burden of hunger. Source: Based on FAO (1998) and EC-FAO (2008).

Download English Version:

<https://daneshyari.com/en/article/7454857>

Download Persian Version:

<https://daneshyari.com/article/7454857>

[Daneshyari.com](https://daneshyari.com)