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A review of hunger indices and methods to monitor country commitment to fighting hunger[☆]

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ABSTRACT

Several indices measuring hunger and progress in achieving hunger eradication have been proposed in the literature. This paper reviews existing hunger indices and critically assesses their quality against a number of desirable properties. Hunger indices are found to be unsatisfactory in a number of ways: they ignore distributional issues; they neglect the occurrence of food and health shocks; and are sometimes based on unreliable data. Anthropometric measurements, stunting in particular, emerge as powerful indicators of hunger and are ideal for addressing a number of policy relevant issues. The paper also introduces a conceptual framework for an index measuring country commitment to fighting hunger. The constitutive elements of this index are illustrated: political will, anti-hunger policies and programmes. Suggestions are made on how a commitment index can be built and what are the data requirements.

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Introduction

During the World Food Summit held in Rome in 1996 governments made a firm commitment to halve world hunger by year 2015. The same goal was set in Target 3 of the MDGs: 'halve between 1990 and 2015, the proportion of people who suffer from hunger'. The progress on meeting this target is measured by two main indicators: the prevalence of underweight children and the proportion of the population below a minimum level of energy consumption as calculated by the FAO (United Nations, 2009). The ability of the FAO index to measure the scale of hunger has been questioned by many (Svedberg, 2000). Several other hunger indices have been proposed to assess the scale of undernourishment, like for example the Global Hunger Index of Welt-hungerhilfe/IFPRI/Concern (Wiesmann, 2006), and the Action Aid hunger index (2009). The presence of multiple hunger indices is a source of confusion for policy makers and the public, because hunger indices produce contrasting figures of the state of hunger in the world. There are two main reasons for the proliferation of indices measuring hunger. First, hunger is a fuzzy concept that can be defined and measured in different ways. Second, the measurement of hunger may serve different policy purposes that lead to different measurements. The present review critically assesses existing hunger indices by looking both at their technical quality

and their policy relevance. In addition, the paper proposes a theoretical framework for the construction of an index measuring country commitment in fighting hunger.

Hunger and its policy relevance

The dictionary definition of hunger indicates an 'uneasy and painful sensation caused by the lack of food' (Oxford, 1999). This sensation can hardly be measured in a meaningful way. In addition, a focus on the sensation would divert the attention from the causes and consequences of hunger like poor health, low productivity, poor physical and cognitive development and mortality (Dreze and Sen, 1989). Hunger, similarly to other fuzzy concepts like poverty and well-being, can be defined either by its causes or consequences, or by both. In the social sciences the tradition has always been describing fuzzy concepts by their consequences. For example, poverty indicators are not based on determinants (income and assets) but on consequences (consumption expenditure). Similarly, education is measured by literacy rates rather than by school attendance or by the availability of schools. On the contrary, the tradition in the measurement of hunger has been focusing on the lack of food. Food availability and food intake have long been used as indicators of hunger (FAO, 1987).

Another, less popular, approach to the measurement of hunger has focused on its consequences. The WHO and the UNICEF produce annual data on the prevalence of failure of physical growth among children in developing countries, but other consequences like morbidity and mortality, poor cognitive development and poor economic productivity have been neglected. More recently two other hunger indices have been developed that combines causes

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and consequences of hunger. They are the Global Hunger Index of Welthungerhilfe/IFPRI/Concern (Wiesmann, 2006) and the HungerFREE Scorecard index of Action Aid (2009).

Beside conceptual reasons, hunger indices differ because are built with different policy purposes. Hunger indices are computed for single countries or broad regions or the world for decision making at the highest political level. Examples of decisions based on hunger indices include: budget allocations between sectors; allocation of aid among countries; and allocation of funds to specific policies. More specifically a hunger index has the following policy uses:

- Measurement tool. It provides a measure of the suffering in the world and can be employed to assess the relevance of hunger in relation to other world issues like climate change and poverty.
- Accountability tool. Both developed and developing countries have made commitments to fighting hunger, which can be monitored by tracking hunger indices over time.
- Targeting tool. A hunger index can guide the allocation of funds between countries and within countries.
- Explanatory tool. A hunger index can be used within causal models as a policy instrument or as an outcome in policy simulations. For example, a hunger index can be used to explain the emergence of conflict or to predict the impact of conflict on welfare.

Desirable properties of hunger indices

A hunger index should have a number of technical properties. It should be able to summarise the information over the phenomenon at hand; it should be sensitive to the distribution of outcomes in the population; it should be able to capture short term as well as long term effects of hunger; and it should be based on reliable data, cover many countries and being robust to different specifications. These properties will now be discussed in turn.

An index can approximate something that is not observable, like the weather temperature used to measure the sensation of heat/cold. Alternatively, an index can simplify a complex issue, like the Human Development Index of UNDP which incorporates information on income, education and health (McGillivray and White, 1993). Like the Human Development Index, hunger indices express a complex set of phenomena in just one metric. In doing so, they may rely on one indicator or many.

When a single indicator is used, this should be able to predict the main consequences of hunger: poor physical and cognitive development; poor productivity; morbidity and mortality (Behrman et al., 2004). When multiple indicators are used the index should be parsimonious in the choice of dimensions (Dasgupta, 2001). Double counting should be avoided by not including in the index dimensions that are strongly causally related. For example, the human development index does not include consumption among its elements because this is largely explained by the already included per capita GDP. The scheme which assigns weights to each dimension should be based on a deep understanding of the existing literature. It is also advisable, when adding over several dimensions, to use similar scales for each indicator or ranking over the different dimensions using a Borda scheme (Dasgupta, 2001).

Hunger indices should be distribution-sensitive like poverty indices. Attention to the distribution of outcomes is a peculiarity of economics which is concerned not with outcomes but with the personal valuations of outcomes (utilities) (Heckman, 2008). The welfare of the suffering should be weighted higher than the welfare of those not suffering, and an increase in the suffering of those living in the worst conditions should result in a change in the hunger index. An index that does not capture this it is not distribution-sensitive.

An indicator that focuses on current states and that misses the effects of past crises is not time sensitive. A hunger index should be able to address vulnerability to deprivation and the long term consequences of hunger. For example, an index looking at food intake over a 1-year period will miss seasonal shortages that can have long-lasting consequences on physical and cognitive development. Finally a hunger index should have some technical qualities related to data availability. First, it should be able to cover a large number of countries. Second, it should be based on reliable data within each country. Third, it should not be sensitive to the assumptions made for its construction.

Review of existing hunger indices

World Bank food security indices

The World Bank produced over the 1970s and 1980s (Reutlinger and Pellekaan, 1986; Reutlinger and Selowsky, 1976) a hunger index that had little applicability but which was highly influential (Longhurst, 2010). Hunger was defined as lack of energy to conduct an active and healthy life and measured by the proportion of individuals with insufficient calorie energy consumption. The method transformed food availability data of the FAO into calorie consumption and used income distribution data from household surveys to estimate the distribution of energy consumption in the population. Those consuming less than a minimum calorie requirement set by the WHO were classified as undernourished.

By construction, changes in the distribution of energy consumption in the population do not change the index. Data are aggregated at the country and annual level, and the index does not capture the effects of seasonal or other short term shortages. While FAO food availability data are not too reliable, data on income distribution normally are. Calorie consumption by income quintiles however is based on assumed values of calorie elasticities of income rather than being estimated, and robustness checks show that the index is quite sensitive to different elasticity values.

From a policy point of view the index allows assessing the scale of hunger at the world level and within countries, but it does not provide a sound basis for targeting because the within country data are not fully reliable. The index can be used to perform simulations of policy interventions in causal models. Difficulties in obtainment of data on the distribution of income, together with the strong assumptions needed for its construction, have prevented its use as a monitoring tool.

The FAO index

The FAO index of food energy deficiency was first published in the fifth World Food Survey (FAO, 1987), and a second round of the index was published in the sixth World Food Survey (FAO, 1996). After the World Food Summit of 1996 the FAO started publishing the index on an annual basis and for all developing countries in *The State of Food Security in the World* series. The index measures hunger as the fraction of the population with per capita energy consumption below standard nutritional requirements. Hunger is the inability to maintain body weight and to work resulting from energy deficiency.

The measurement of hunger rests on three critical parameters: per capita availability of food, inequality in energy intakes and country age-sex specific energy requirements. Its calculation follows three steps (Neiken, 2003). First, the FAO estimates per capita calories intake based on FAO country Food Balance Sheets. Second, the distribution of calories in the population is estimated by calculating the coefficient of variation of energy expenditure and assuming a log normal distribution of energy consumption. Third, the

FAO establishes a calorie cut-off point and count the number of people who are undernourished.

This index is unsatisfactory in a number of ways. Food availability is a rather poor predictor of failure to grow, mortality and economic productivity (Svedberg, 2000). The index is not distribution-sensitive and an increase in food deficiency of the most deprived sector of the population would leave the index unchanged. Food availability data are averaged over a 3 year period and the effects of seasonal crises and droughts go unnoticed. There are also issues regarding the caloric cut-off point adopted by the FAO. The FAO follows estimates of minimum energy requirements calculated by the WHO for different age and gender groups. Estimated requirements are based on multiples of the basal metabolic rate in order to account for occupational and social activities (WHO, 1985). Country specific cut-off points are obtained by the FAO by aggregating sex-age-specific minimum energy requirements using the proportion of the population in the different sex-age groups as weights (Neiken, 2003). Svedberg (2002) and Dasgupta (1993) critically discuss the FAO cut-off points and maintain that their use results in a large underestimation of undernutrition in the world.

The index can be calculated for all countries because data on food availability are readily available, though they are not fully reliable (Svedberg, 2000). The index is not robust as is very sensitive to the parameter values used for its calculation: energy cut-off points, food availability, and the distribution of calories across households (Beaton, 1983; Neiken, 2003; Svedberg, 2000). The index provides data on the scale of hunger in the world and a measure for assessing countries progress in achieving the MDG goal of halving hunger by 2015. Because the information generated by the index does not have value at the country level, the index cannot be used in causal models or for targeting purposes.

Food quality indices

Hunger outcomes do not only depend on calories availability and consumption, but also on the composition of the diet. Hawkesworth et al. (2010) offer a thorough discussion of the relevance for public health of a balanced diet in terms of macronutrients, vitamins and minerals. Recently, the attention of nutrition experts has focused on prevalence rates of vitamins and other micronutrients deficiencies in developing countries (Horton et al., 2008). The paucity of the data and the absence of an agreed methodology to assess healthy diets (Hawkesworth et al., 2010) have prevented the use of indicators of diet composition in the formulation of hunger indices.

Smith et al. (2006) offer an attempt to include diet composition in the measurement of hunger. They define hunger as the lack of access, sufficiency and quality of food and use two separate indicators: the fraction of the population that is food energy deficient, and the fraction of the population with a poor diet. The first indicator is obtained by calculating calorie consumption from household expenditure surveys. The second is obtained by defining a diet as insufficient when a household fails to consume at least one item from a list of seven different food categories.

None of the two indicators is sensitive to changes in the distribution of outcomes. Whether the index is sensitive to the effects of seasonal and other short term food shortages depends on the way the survey data are collected. In general however, few expenditure surveys collect consumption data with sufficient precision to detect short term expenditure shocks. The indices can be calculated only for those countries and for those years for which nationally representative expenditure surveys are available. The data used are of very good quality because are based on household interviews from representative samples of the population. Few assumptions are required in the calculation of the food deficiency indicator, while the assumptions made for the calculation of the

diet quality indicators are both strong and arbitrary (Arimond and Ruel, 2004).

For lack of data, the index is unable to provide information on the scale of hunger in the world, nor can be used for monitoring progress in fighting hunger. The index is an invaluable instrument for targeting as it provides information on hunger status that can be disaggregated geographically or by socio-economic groups. The index can also be used in causal models within countries.

Anthropometric indicators

Anthropometric indicators see hunger as 'a syndrome that results from the interaction between poor diet and disease'. (WHO, 1995) Most common anthropometric indicators are low weight-for-height (wasting), low weight-for-age (underweight), and low height-for-age (stunting) of children under-five. Methods for the measurement of nutritional outcomes in the adult population are available but are rarely used. The methodology employed consists of measuring height and weight of children and comparing their standardised values against an international reference norm of healthy children.

Undernutrition rates are strongly correlated with other variables associated with hunger like morbidity, poor productivity, and mortality (Behrman et al., 2004; Svedberg, 2000; WHO, 1995). Undernutrition is therefore a good predictor of the general state of hunger. Prevalence rates of undernutrition are often presented in disaggregated form for moderately and severely malnourished children, thus providing distributional information on the intensity of hunger. Anthropometric indicators are sensitive to shocks in different ways (WHO, 1995). Wasting is a process leading to significant weight loss as a consequence of acute starvation or disease and captures only short term effects of hunger. Stunting is a chronic indicator of hunger because is the result of a failure to reach the growth potential as a consequence of recent or past shocks. Underweight is an indicator of difficult interpretation as it tends to conflate long term failure to grow and short term weight loss. An underweight child can be thin, short or both.

Anthropometric data are available for all countries of the world, though in some countries the data are not collected every year. They are published every year by the UNICEF in the *State of the world's children* report series. Data on height and weight are fairly reliable as the technology employed for their measurement is simple and inexpensive. There are no major robustness issues, with the exception of unavoidable measurement error. From a policy point of view, anthropometric data allow the estimation of the scale of hunger at the world level. They allow targeting of interventions at the country level and within countries. They can be used in causal models as explanatory variables or as dependent variables. Finally they can be used to monitor progress in achieving the MDGs.

The Global Hunger Index

Since 2006 the IFPRI publishes an annual Global Hunger Index in the *Global Hunger Index* series. The index was built with the goal of assessing hunger at the world level, monitoring progress on achieving the MDGs, and interpreting trends within causal models (Wiesmann, 2006). The index explicitly addresses the fact that hunger is a multidimensional phenomenon and is constructed using three available indicators: the share of the population with insufficient access to food (provided by FAO); the fraction of the population of children under-5 which is underweight (provided by WHO); and the mortality rates of children under-5 (provided by UNICEF). The percentage values along these three dimensions are added up and then divided by three. The resulting index is used to rank developing countries in three categories based on

arbitrarily selected cut-off point values of the index: serious problem, alarming, and extremely alarming.

The index combines three different aspects of hunger, and this is its great merit. However, food intake, nutritional status and mortality are strongly correlated, thus producing double counting. The weighting scheme adopted is very simple but arbitrary. The choice of adding up the percentage values of each dimension without prior scaling is also questionable as this ends up attributing lower values to changes in mortality rates, whose percentage values are much lower than those of undernutrition and food availability. The index is not sensitive to changes in the distribution of outcomes as none of its constitutive elements is. Similarly, the index is poorly sensitive to seasonal or other short term food and health shocks.

The index can be calculated for all countries of the world and the data used are fairly reliable. The authors of the index have also performed a number of sensitivity checks that point to the robustness of the index (Wiesmann, 2006). The index can be used to measure the scale of hunger in the world and in cross-country comparisons. The index can also be used for targeting countries or regions of the world and for holding governments accountable. The authors claim the index has explanatory power on a range of socio-economic phenomena analysed at the cross-country level (Wiesmann, 2006).

The Poverty and Hunger Index

Gentilini and Webb (2008) have proposed a multidimensional index of poverty and hunger which combines the first five official MDGs indicators: proportion of the population living on less than a dollar per day; poverty gap; share of the poorest quintile; prevalence of children underweight (as reported by the WHO); and proportion of undernourished population (as calculated by the FAO). The five indices are scaled against the maximum values of each indicator and added up using equal weights as in the construction of the human development index. A second version of the index measures progress in achieving each of the MDGs over the period 1990–2015. In this version of the index progress in undernourishment, for example, is scaled against planned progress up to 2015 using the latest data available. Notice that no goals have been set internationally regarding inequality and there is some arbitrariness in defining progress over this dimension.

The index is multidimensional and sensitive to the distribution of income, but not of hunger. The authors show that correlation between poverty and hunger is not always high (Gentilini and Webb, 2008) and conclude that the indicators used are not redundant to each other, but robustness checks were not performed. Data for its construction are available for most countries, though they are not always of good quality (prevalence of undernourishment) or up to date (inequality measures). The index can be used for a number of policy exercises, particularly holding countries accountable on their progress in achieving the MDGs.

The Action Aid Hunger Index

The NGO Action Aid has produced an index that measures not only hunger outcomes, but also anti-hunger policies along four dimensions: legal commitment to right to food; investments in agriculture; investments in social protection; and hunger outcomes. Each dimension is composed of a number of constitutive elements that are weighted in different ways. Countries abilities to achieve outcomes are assessed against capabilities by penalising richer countries. Scores on the four dimensions are then combined in a single index that is used to rank developing countries.

The index is an interesting attempt to monitoring not only outcomes but also its determinants. However, the inclusion in the

same indicator of an outcome and of its determinants is worrisome as it results in double counting by construction. The weighting scheme adopted within each dimension is made explicit but is not always defensible. The ranking of countries is also problematic. Since the dimension are measured on an ordinal scale, a Borda ranking scheme would be more appropriate than simply adding up the scores over the four dimensions (Dasgupta, 2001). The index is not concerned with distributional issues or with long term effects of hunger. The index is based on readily available data and can therefore be calculated for all countries of the world. The data used for its construction however, including the FAO data, are of dubious quality and no robustness check has been performed.

The policy relevance of the index is quite high as it can be a powerful advocacy tool. The index can also help in assessing the problem of hunger at global scale and performing regional or country targeting. It can hardly be used in causal models, though the distinct elements of the index could individually be used for this purpose.

Assessment of hunger indices

One-dimensional indices produce estimates of the state of hunger in the world while multidimensional indices produce country rankings. Hence indices are not always comparable. A few examples show a wide diversity of estimates. Table 1 compares hunger estimates of the FAO (FAO, 2008) and anthropometric indicators (UNICEF, 2009). Stunting finds twice as many undernourished than the FAO index in Latin America, South Asia and in the developing countries overall.

The differences between country rankings are not less striking. Table 2 shows correlation coefficients between the indices. The FAO, GHI and Action Aid indices correlate well, but the set of these indices correlates rather poorly with anthropometric indices.

Table 3 further illustrate the differences with some examples of country rankings. In some cases, like China and Ethiopia, all indices rank country consistently. But in the cases of Guatemala, India and Malawi the differences are puzzling.

Most indices perform rather poorly against the desirable properties outlined earlier. Only two of the indices reviewed are constructed over more than one dimension though it is widely acknowledged that hunger is a multifaceted phenomenon. The adding and weighing schemes used by these indices are rather

Table 1
Extent (%) of hunger in the world 2000–06.

	FAO index	Underweight	Stunting
Developing countries	16	26	32
Latin American and Caribbean	8	7	16
South Asia	23	42	46
Sub-Saharan Africa	30	28	38

Table 2
Rank correlation coefficients between different indices.

	FAO index	Global Hunger Index	Action Aid Index	Underweight	Stunting
FAO index	1				
Global Hunger Index	0.89	1			
Action Aid Index	0.68	0.78	1		
Underweight	0.38	0.59	0.58	1	
Stunting	0.44	0.61	0.44	0.60	1

Table 3
Examples of country rankings by five hunger indices.

	FAO index	Global Hunger Index	Action Aid Index	Underweight	Stunting
China	3	3	2	2	1
Ethiopia	25	25	18	24	24
Guatemala	10	7	6	15	26
India	11	18	22	28	25
Malawi	16	15	4	6	23

Table 4
Assessment of hunger indices.

	WB	FAO	SAA	ANTHRO	GHI	PHI	AAHI
Multidimensional: sound weighting	n.a.	n.a.	n.a.	n.a.	no	yes	No
One-dimensional: good predictor	No	No	No	Yes	n.a.	n.a.	n.a.
Distribution-sensitive	No	No	No	No	No	Yes	No
Temporally-sensitive	No	No	No	Yes	No	No	No
World coverage	Yes	Yes	No	Yes	Yes	Yes	Yes
Reliable data	No	No	Yes	Yes	Yes	Yes	No
Robust	No	No	Yes	Yes	Yes	No	No
Scale measurement	Yes	Yes	No	Yes	Yes	Yes	No
Targeting	No	No	Yes	Yes	Yes	Yes	Yes
Explaining	Yes	No	Yes	Yes	Yes	Yes	No
Accountability	No	Yes	No	Yes	Yes	Yes	Yes

unsatisfactory. Among one-dimensional indices, only anthropometric indices predict well other dimensions of hunger. None of the indices is sensitive to the distribution of outcomes with the exception of anthropometric indices that are sometimes disaggregated by moderate and severe prevalence rates. All indices tend to ignore effects of vulnerability and shocks. The only exception is stunting which summarises the history of shocks suffered by the population in the years preceding the observation.

The construction of indices has been largely driven by the availability of data, sometimes irrespectively of their quality. The wide use of the FAO food availability index and its use by multidimensional indices are best explained by the ability to construct this index for each country every year rather than by any intrinsic quality. Expenditure and anthropometric data are fairly reliable but rarely collected on a large scale in every country. All indices score well on some of the policy dimensions considered. The measurement of the scale of hunger in the world and accountability have been the major concerns of existing indices, while targeting and learning have received much less attention (see Table 4).

Assessing progress in fighting hunger

Hunger eradication is a goal set by the international community to which countries have committed substantial resources. There is growing dissatisfaction with hunger indices used to monitor progress (Sumner, 2010). While indices are informative of the extent of success, they are silent on the processes determining the outcomes. This section builds a simple logical framework of policy making oriented to eradicate hunger. The framework is then used to suggest indicators that allow monitoring progress in fighting hunger in a more effective way.

Hunger eradication depends sequentially on the following elements (see Fig. 1):

- Campaigns and information generate **political will** (conditional on the institutional environment).

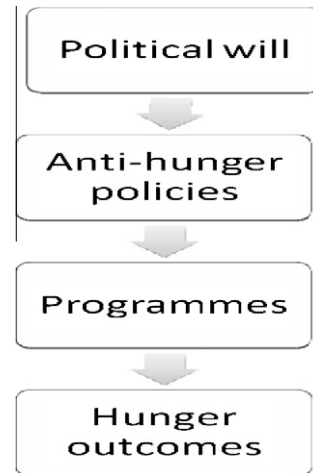


Fig. 1. Basic theory of change of hunger eradication.

- Political will translates into **policies** (conditional on the political environment).
- Policies translate into **programmes** on the ground (conditional on resources).
- Programmes reduce **hunger** (conditional on capacity).

Political will

Hunger is ethically unacceptable but may not be at the top of the governments' agenda for lack of information or because the government has other priorities. Mobilization campaigns, political demands by oppositions and the press may urge the government to take action, either because the government becomes aware of a problem or because ignoring the problem becomes politically too costly. There are characteristics of the environment that may affect the consolidation of political will. For example, the operation of free press and campaigns may not be feasible in undemocratic and authoritarian states, or the population may not be sufficiently educated to raise political demands.

Policies

Policies are government's initiatives to fight hunger. If political will is government's good intentions, then policies are the expressions of these intentions before being put into practice. Examples of policies include: institutional change; budget allocations; laws instituting the right to food and the implementation of specific programmes. Good intentions and declarations alone are not sufficient to generate policies. The government must be committed to see intentions through, which implies making political sacrifices and fighting political and institutional opposition. Factors determining policies therefore include: government leadership and ownership; government full understanding of the issues at stake; public pressure and support as produced by the media or political groups.

Programmes

Because hunger is a multifaceted phenomenon, a broad range of programmes are adopted to fight hunger. These programmes are too many to be mentioned, but can be classified in the following categories: pro-growth policies; pro-poor growth policies; health and education policies; agricultural policies; and nutrition policies. The choice of policies will depend on the political orientation of the

government and on the information set used. The most important environmental factor affecting policy choice is the availability of resources and administrative capacity.

A hunger commitment index

A hunger commitment index can be built on indicators of political will, policies and programmes. These indicators can be aggregated into a single index or can be considered separately to monitor the operation of hunger reduction efforts. Some of the indicators are based on the collection of factual information, while others are based on perceptions elicited from informed observers.

Political will is often used to explain the persistence of hunger, but the concept is rarely defined and never measured (Dreze and Sen, 1989). There is no reason why political will should not be measured. Its assessment is not more complicated than assessing the extent of corruption, good governance or freedom, a task that is performed fairly well by a number of available indicators (see for example Kaufmann et al., 2009). The WHO (2004), for example, has developed a set of indicators to assess political commitment in conducting national tuberculosis programmes. Indicators inevitably rely on interviews of informed stakeholders, an approach also followed by Transparency International and the Freedom House to calculate the Corruption Perceptions Index and the Liberty Index respectively.

Though some agreement exists regarding the policies required to fight undernutrition (see for example Buttha et al., 2008), the right policy mix varies by country as different countries face different challenges in different environments. Rather than assessing policies based on a pre-defined list applicable to all countries, it is advisable to identify the appropriate policies within each country and then assess governments' actions against their specific optimal policy set. While conceptually this might seem a tremendously difficult task, practically it might be relatively easy if performed by a pool of experts within each country.

Indicators of policies and programmes are much easier to build as these are based on observable data. In particular, data on budget allocations to agriculture, health and social protection can be obtained from public expenditure accounts. Data on specific programmes implemented at the country level and the funds committed can complement this information.

The hunger commitment index can be obtained by aggregating indicators of political will, policies and budget allocations. Aggregation should be performed using a Borda ranking scheme because indicators are measured on ordinal scales, and the indicators should be previously normalised to one like in the human development index. This index will not replace existing hunger indices because measurement of the scale of hunger is not its goal and it is not intended to combine existing indices in a sort of super index. Rather, its objective is the description and monitoring of the political process determining hunger outcomes which is currently neglected by all indices.

The index will assess the political process over several dimensions of political will, policies on the ground and budget allocations. It will be relevant for targeting because it could be used for advocacy purposes and to hold governments accountable in achieving the MDGs. Finally, the index could be used in explanatory or predictive models in which hunger is the dependent variable, because the political process is one important determinant of success in fighting hunger. One limitation of this index is the availability of data. While policies and budget allocations are factual information that can be easily monitored, political will needs to be assessed through perception surveys which require a considerable data collection effort. We believe that the information potentially generated by this index is worth this data collection effort.

Conclusions

Hunger indices have improved our definition and understanding of hunger. Indices have also proved useful in tracking progress on hunger eradication. However, it must be recognised that the existing hunger indices are unsatisfactory in a number of respects. First, hunger indices ignore distributional issues and are unable to assess the incidence of hunger. This neglect is rather surprising because is not a result of the lack of data but of the methodology employed for their construction. Second, hunger indices are not sensitive to the occurrence of shocks like droughts, nor are designed to detect the impact of hunger in the long term. Third, the design of multidimensional indicators of hunger is welcome because hunger is a multifaceted phenomenon. However, there are a number of technical flaws in the design of multidimensional hunger indices that need to be addressed.

Theoretical and practical reasons suggest that the measurement of hunger would be best obtained by the collection on anthropometric data on stunted children. Based on a number of technical criteria, anthropometric measurements, and stunting in particular, emerged as the best indicators of hunger. Stunting is strongly correlated with other welfare indicators like mortality (Svedberg, 2000), it is an indicator of long term deprivation and allows a distributional analysis of its incidence in the population. In addition, anthropometric measurements are easy to perform on a large scale with very simple technology and do not have many of the measurement problems of survey-based food consumption data.

The present review also considered the validity of existing hunger indices for accountability purposes. As the MDGs deadline is approaching there is growing interest in the formulation of indices that are tracking government success in fighting hunger. We suggest that there is a need for a hunger index that measures the determinants of hunger eradication. This index should measure variables quoted in the policy debate but rarely defined and never measured: political will, policies and programmes to fight hunger.

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