

## Editorial

# What do we want to know about the relationship of wealth or income to nutrition?

An understanding of the relationship of assets or income to nutrition can serve as an important stimulus for policy. In particular, if there is a sharp gradient of nutritional status as one moves away from poverty, then a different set of programmes might be prioritized than if – as is often the case – there is only a modest gradient.

While many data sets such as Demographic and Health Surveys lack income or expenditure information to address this issue, Filmer and Pritchett<sup>(1)</sup> have shown that asset indices can be conveniently used to map the relationship of economic status to nutrition. This technique – now widely used – also addresses the fact that a graphic or regression analysis of the association of an outcome with one that is measured with substantial error (as are expenditures and income) is biased towards zero in proportion to the measurement error. The construction of an asset index sweeps out most of the measurement error and thus reduces this bias appreciably. However, a measure of income or expenditures that is predicted from assets also has this appreciable advantage over directly reported income.

Mohsena *et al.*<sup>(2)</sup> present an alternative to asset indices (or as they term these, poverty indices) that has two inherent advantages; it is simple to collect and it is cardinal while asset indices are ordinal. Once ranked with an asset index, households are generally placed in equal-sized groups such as quintiles. When a large share of a population is malnourished – e.g. 48.4% are stunted in the sample in Mohsena *et al.* – by construction, there will be a large share of the malnourished excluded from the poorest quintile. In contrast, with the possession score used by Mohsena *et al.*, the number of households in each classification is variable and depends on the distribution of these possessions in the communities studied. This most likely contributes to the stronger correspondence of the index employed by Mohsena *et al.* and nutritional outcomes as compared with an asset or poverty index. But it cannot be the whole story since the slopes of these relationships differ significantly with malnutrition rates declining much more rapidly with an increased number of possessions than the rates decline with higher asset rankings.

It is these slopes rather than the evident ability of the index to proxy for malnutrition rates that are most noteworthy. The latter ability to serve as a marker has only a modest practical use since there is little difference in

the relative ease of collecting anthropometric indicators of nutritional status and collecting even the most accessible information on household possessions while the direct measures of nutritional status are clearly more valuable for virtually any application. Unfortunately, while the difference in slopes performs a service in reminding researchers to double check their assumptions, they provide little assistance in addressing many of the key policy questions around socio-economic status. Absent a structural model of behaviour it is not only difficult to determine which of two contrasting results is a more valid reflection of the true relation of economic status and other dimensions of welfare, it is also a challenge to go to more general inference.

Mohsena *et al.* are careful to report their results as an association. A strong one, to be sure, but nevertheless not a causal model of how possessions might influence nutritional outcomes. There are, in contrast, various plausible models indicating how income affects nutrition through the purchase of food and health services and through investments in education as well as in access to water and sanitation. One of the earliest attempts to link medical and socio-economic frameworks is Mosley and Chen<sup>(3)</sup>, although there have been numerous variants since. Economists tend to express similar approaches in terms of assets and knowledge used to determine which inputs to combine into a health production function. This difference of terminology sometimes obscures both the areas of disciplinary overlap as well as the region of complementarities<sup>(4)</sup>.

Still, it remains essential that appropriate conceptual models are applied to indicate what improved socio-economic status can, and cannot, do to address malnutrition. Economists often overestimate the speed at which national income growth, even when evenly distributed, will reduce malnutrition and thus they underestimate the need for specific public health interventions. When considering investment priorities, governments may assume that robust income growth will bring sufficient improvements in nutritional status or that increasing food production will be adequate to address undernutrition. Evidence from household surveys or from cross-country comparisons, however, indicate that growth rates similar to historic patterns will take generations to reduce malnutrition<sup>(5,6)</sup>. For example, although Alderman<sup>(7)</sup> finds that income growth will have a positive and statistically

significant impact on undernutrition in rural Uganda, the same study shows that with a 5 per cent rate of per capita income growth – substantially larger than the average for the last decade – it would take 33 years to reduce the current underweight rates by half. If per capita income growth rises to 8 per cent – a rate difficult to attain, let alone sustain, the number of years required to halve undernutrition drops to 14 per cent.

Similarly, the relationship of possessions to nutrition provides only an indirect answer to another debate around the social policy: the degree to which social transfers address malnutrition. As currently designed, some transfer programmes may provide a sufficiently large share of income to low-income households to enable a meaningful improvement of nutrition. But to understand this prospect better, one needs a parameter that will calculate the impact of these transfers. One wants to know how much transfer is needed to effect a behaviourally meaningful change<sup>(8)</sup>. It would also be valuable to assess whether or not the mode of income transfer influences care giving or health seeking in a manner that exceeds the impact of income growth<sup>(9,10)</sup>. Unfortunately, indices – whether cardinal or ordinal – cannot easily be directly applied to *ex ante* assessment of a change in resources that the household commands. This drawback is in part because the metric – units of assets or possessions – differs from the metric by which income growth or transfer programmes are measured. Moreover, it is hard to indicate the causal pathway of income – or the causal role of other programmes and services controlling for income – looking at possessions that are themselves the result of income growth, rather than the cause. Ultimately, the same rigour on defining causal models in economic analysis as is used in determining preferred health

strategies needs to be applied to debates on the role of income generation.

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## References

1. Filmer D & Pritchett L (2001) Estimating wealth effects without expenditure data – or tears: an application to educational enrollments in states of India. *Demography* **38**, 115–132.
2. Mohsena M, Mascie-Taylor CGN & Goto R (2010) Association between socio-economic status and childhood undernutrition in Bangladesh; a comparison of possession score and poverty index. *Public Health Nutr* **13**, 1498–1504.
3. Mosley H & Chen LC (1984) An analytical framework for the study of child survival in developing countries. *Popul Dev Rev* **10**, Suppl., 25–45.
4. Alderman H, Behrman JR & Hoddinott J (2007) Economic and nutritional analyses have substantial synergies for understanding human nutrition. *J Nutr* **137**, 537–544.
5. Haddad L, Alderman H, Appleton S *et al.* (2003) Reducing child malnutrition: how far does income growth take us? *World Bank Econ Rev* **17**, 107–131.
6. Alderman H & Linnemayr S (2009) Anemia in low income countries is unlikely to be addressed by economic development without additional programs. *Food Nutr Bull* **30**, 265–270.
7. Alderman H (2007) Improving nutrition through community growth promotion: longitudinal study of the nutrition and early child development program in Uganda. *World Dev* **35**, 1376–1389.
8. Fernald LCH, Gertler PJ & Neufeld LM (2008) The importance of cash in conditional cash transfer programs for child health, growth and development: an analysis of Mexico's Oportunidades. *Lancet* **371**, 828–837.
9. Leon M & Younger S (2007) Transfer payments, mothers' income and child health in Ecuador. *J Dev Stud* **43**, 1126–1143.
10. Paxson C & Schady N (2008). *Does Money Matter? The Effects of Cash Transfers on Child Health and Cognitive Development in Rural Ecuador*. *World Bank Policy Research Working Paper* no. 4226. Washington DC: World Bank.