



How poor is 'poor'?

Towards a rights-based poverty line

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It should be noted that this paper was finalised in April 2008, before the World Bank/PovCalNet poverty data were updated to 2005 purchasing power parity. All of the analysis and data are therefore based on the previous (1993 PPP) estimates.

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Executive summary

The World Bank's estimates of global poverty, based on the "\$1-a-day" line, have been a major intellectual and technical feat. There can be little doubt that they have also had a major political impact in putting poverty on the international agenda.

However, there are a number of important issues underlying the methodology by which they are produced, raising questions about the accuracy and reliability of the picture they present of the level, composition and trends of global poverty.

- It focuses exclusively on income (or more precisely consumption).
- It sets the poverty line at an essentially arbitrary level.
- Poverty estimates are critically dependent on the base year used for price indices, which should make no difference.
- The "\$1-a-day" line itself, used as the basis for policy, embodies an implicit moral judgment that this level of income is morally acceptable, which is at best highly questionable.
- It imposes inconsistent standards between countries in terms of living standards, which vary very widely between people living at "\$1-a-day" in different countries.
- The conversion factors used to translate poverty lines into local currency incomes are inappropriate, giving much greater weight to the prices of goods and services bought by non-poor than by poor people.
- Purchasing power parity (PPP) estimates for many countries have been based on estimates rather than measurement (although this has improved markedly since the paper was written).
- Updating the poverty line over time is problematic, for example failing to reflect differences in inflation as between rural and urban areas.

There are further problems in the estimation of poverty in those years in which no surveys have been conducted; and the method of estimating poverty since the last survey are systematically skewed, so that they risk exaggerating the rate of poverty reduction in recent years.

Important as it has been to put poverty onto the global agenda, if the figures on which our view of poverty is based are potentially misleading, then we are in serious danger of adopting the wrong policies. More specifically, given the nature of the methodological problems, we are in danger of being lulled into complacency that the thrust of our global economic system is broadly consistent with reducing, and ultimately eradicating poverty.

We argue that a less arbitrary approach to defining poverty needs to be based on defining an income level consistent with a standard of living which we consider the minimum morally acceptable level. This can in principle be based either on an "inputs" approach (the cost of accessing what is needed to fulfil basic needs), or on an "outcomes" approach (the level of incomes associated in practice with minimum acceptable levels of indicators of physical well-being). Each of these approaches can be adopted either globally, to produce a single universal poverty line (cf the "\$1-a-day" line), or on a country-by-country basis, to generate a poverty line for each country. This gives us four broad categories of non-arbitrary poverty lines.

We review four alternative approaches to defining poverty, corresponding to three of these categories:

- Kakwani and Son's International Food Poverty Line (global/input-based);
- Peter Edward's Ethical Poverty Line (global/outcome-based); and
- Morris *et al*'s Minimum Income for Healthy Living, and Reddy *et al*'s Capability-Based Approach (country-specific/input-based)

However, each of these approaches is, in different ways, problematic.

We therefore propose a new approach to the definition of poverty, which we call the Rights-Based Poverty Line (RBPL), based on the fourth and final category – a country-specific outcomes-based approach. The RBPL approach is based on the estimated statistical relation between income and indicators of well-being which correspond to different economic and social rights (health, nutrition, education, etc). By setting a single universal threshold level of the indicator concerned, and establishing the income at which that level is actually achieved in each country, we can in principle define a poverty line for each country which is at a different level of income, but gives rise to an equivalent standard of living in each country.

This approach, we argue, both avoids the issues arising from “input-based” approaches and resolves the problems inherent in any global poverty line defined in terms of incomes, while maintaining consistency between countries. We present estimates of RBPLs for six countries (Bolivia, Egypt, India (rural and urban), Nicaragua, Senegal and South Africa) using the infant mortality rate as an indicator of the right to child survival, based on four alternative threshold levels. This demonstrates the wide range of incomes required to achieve equivalent living standards in different countries.

Having established a set of poverty lines, there are two ways in which poverty can be reduced – either by increasing incomes to the level at which rights are fulfilled, or by reducing the income required to fulfil each right.

The picture of poverty this approach presents is much more complex than those generated by other approaches, and particularly the single “poverty headcount” (and largely ignored “poverty gap”) figures generated by approaches based on a single global poverty line defined in “dollars per day”.

In the RBPL approach, we have multiple dimensions of poverty – health, nutrition, education, housing, access to water and sanitation, etc. In each of these dimensions, we have four indicators – the poverty line itself, the proportion of the population below it, the poverty gap (reflecting the extent to which incomes are below the RBPL) and the rights gap (indicating the extent to which rights are not fulfilled as a result of poverty).

However, this complexity is inevitable if we are to obtain a meaningful picture of the multi-faceted issue of global poverty, and we present a simple graphical approach to present poverty comparisons between countries and over time.

Through this approach, the RBPL can provide us with much more relevant information than the simple headline figures of “dollar-a-day” approaches. For example, we can distinguish the extent to which poverty arises from low incomes and from low living standards at a given level of incomes in each country, and assess the relative importance in each case of income generation and (for example) improving access to health services or education; we can identify priority areas in which access to services most needs to be improved for low-income households; and we can avoid the misleading interpretation that poverty is falling where rising incomes are off-set by falling living standards relative to income.

At present, the data are not available to estimate RBPLs for all developing countries; and what data exist are far from ideal for the purpose. We therefore present proposals for meeting the data requirements for a more comprehensive and reliable application, building on existing approaches. In view of the potential advantages of this approach in terms of presenting a fuller, more nuanced and potentially more accurate picture of global poverty – which would seem essential to effective policy-making for its reduction – the relatively limited cost of such data improvements would represent a very worthwhile investment.

Introduction

Discussions of global poverty are conducted almost exclusively in terms of the so-called '\$1-a-day' line developed and used by the World Bank.

This definition of poverty has been adopted by the international community as the basis for the first of the Millennium Development Goals (MDG1) – to 'reduce by half the proportion of people living on less than a dollar a day'.¹ For most people, this is what global poverty has come to mean.

This definition of poverty, however, raises a number of fundamental issues. In particular, it focuses exclusively on one aspect of poverty, namely income, to the exclusion of other critical aspects of deprivation, such as assets, access to essential services, and social exclusion. Even in the context of income, it sets the poverty line at an essentially arbitrary level. It also gives rise to a number of serious technical problems in the measurement of poverty, comparisons between countries, and analysis of changes in poverty over time.

Still more importantly, setting a poverty line as a basis for policy and the measurement of progress represents an implicit moral judgment. By defining poverty as the proportion of the world's population below a particular level of income, we are effectively saying that it is morally acceptable for people to live at, or just above, this level of income, so long as they do not live below it. The \$1-a-day line, however, is not based on any such judgment or analysis, and in most developing countries living standards at this level of income are below anything that could reasonably be regarded as acceptable.

This paper summarises the fundamental problems with the \$1-a-day approach, and what they mean for what we think we know about poverty. It goes on to review other alternatives, to assess whether they provide a more viable alternative. Finally, it proposes a new approach – a rights-based poverty line (RBPL), based on the level of income at which living standards consistent with economic and social rights are actually achieved in each country – which, we argue, resolves the problems inherent in the definition of poverty more satisfactorily than the other alternatives.

What's wrong with a dollar a day?

Until 1990, there was no widely accepted international definition of poverty. The World Bank filled this gap with the \$1-a-day line in the 1990 edition of its flagship publication, *The World Development Report*.²

The Bank's leading poverty analyst has summarised the purpose of this line, and of estimates of poverty based on it, thus:

*'Ultimately, the Bank's purpose in producing these aggregate measures [of poverty, based on the \$1-a-day line] is to provide a consistent assessment of progress against absolute income poverty in the developing world.'*³

While the \$1-a-day poverty line has become by far the most widely used standard of poverty, however, it is also generally acknowledged that it has important limitations. Many observers and analysts, particularly outside the World Bank, see these problems as seriously undermining its practical usefulness and/or its conceptual validity.

*'The global poverty counts produced by the World Bank are **too low** due to **methodological problems** with the construction of its \$1-a-day poverty line.'*⁴

*'The Bank's [\$1-a-day] poverty line leads to **meaningless poverty estimates**, as some of those identified as poor have clearly greater command over commodities than some of those identified as non-poor.'*⁵

*'This **crude indicator** [the \$1-a-day poverty line] may have been a convenient interim measure for practical purposes, a short-term expedient, but **has not turned out to be of continuing value**.'*⁶

*'There are good reasons to believe that global poverty counts based on the dollar-a-day international threshold are **meaningless**... The origins of the dollar-a-day threshold **lack a solid analytical basis**... Global poverty counts based on \$1-a-day **have neither normative value nor empirical relevance** for poverty analysis... Clearly the current state of global poverty estimation is **far from adequate**... We need to find better ways of fixing internationally comparable poverty lines.'*⁷

*'The World Bank's approach to estimating the extent, distribution and trend of global income poverty is **neither meaningful nor reliable**. The Bank uses an **arbitrary** international poverty line that is **not adequately anchored in any specification of the real requirements of human beings**. Moreover, it employs a concept of purchasing power "equivalence" that is **neither well defined nor appropriate** for poverty assessment. **These difficulties are inherent in the Bank's "money-metric" approach and cannot be credibly overcome without dispensing with this approach altogether**. In addition, the Bank extrapolates incorrectly from limited data and thereby creates **an appearance of precision that masks the high probable error of its estimates**... There is reason to believe that the Bank's approach **may have led it to understate the extent of global income poverty and to infer without adequate justification that global income poverty has steeply declined** in the recent period.'*⁸

The Bank's poverty estimates have an importance beyond the actual numbers they produce. Increasingly, what matters to policy-makers is what is measured; and, by

highlighting the scale of global poverty, the \$1-a-day estimates have succeeded in raising the profile of the issue and the resources devoted to it.

*'The politics of resource mobilization may demand the use of international poverty lines that sound comparable, even when they are not.'*⁹

In terms of focusing decision-makers' attention on global poverty, the existence of estimates of its extent may thus matter more than whether the numbers actually mean anything. For evidence of this, one need look no further than the success of the *Make Poverty History* campaign in raising the profile of the issue, and moving it to the centre of G8's agenda at its Gleneagles Summit in 2005.

If the numbers do not accurately reflect actual levels, patterns and trends of poverty, however, they may distort what decision-makers decide about *what* should be done, *how* it should be done and what *priority* it should be given. The reliability of poverty estimates is therefore a critical issue. As Kakwani and Son observe, 'policy efforts focused on the wrong target, though simple, may be self-defeating.'¹⁰

In fact, it has been argued that \$1-a-day poverty estimates have been deliberately used as a means of defending the current model of commercial globalisation.

*'The main use of the USD 1 per day indicator is ideological and political. The indicator has led World Bank researchers to claim that "globalization is working", since it seems to imply that the proportion of people living in poverty in the world as a whole is declining at a rate that will make Millennium Development Goal (MDG) 1 achievable.'*¹¹

This sceptical view receives some support from a recent independent review of World Bank research, though not in the specific context of the \$1-a-day poverty estimates. While the review, with some justification, highlights the Bank's work in developing global estimates of poverty among the 'outstanding work in the Bank's portfolio', it also notes with respect to the Bank's 'extremely visible work on globalization, on aid effectiveness, and on growth and poverty', on which many of its pronouncements on poverty reduction are made:

*'The panel had substantial criticisms of the way that this research was used to proselytize on behalf of Bank policy, often without taking a balanced view of the evidence, and without expressing appropriate scepticism.'*¹²

What IS \$1-a-day?

At first sight, one might think that the \$1-a-day poverty line at least provides a clear and easily understood basis for assessing poverty, and for judgments about its moral acceptability. We know what income is; we know (roughly) how much a dollar is worth; and we know how long a day is.

Inevitably, perhaps, it isn't as simple as that. First, poverty is generally measured on the basis of **consumption rather than income**. This is primarily because household surveys (the basis for poverty estimates) are generally seen as measuring spending more accurately than income. The implications, however, are significantly different. Households whose incomes are in danger of falling below the poverty line can often maintain their consumption by drawing on savings, borrowing or selling assets – but generally only temporarily. Equally, the very poorest households in terms of incomes are effectively forced to find some means of maintaining their consumption simply for survival. The question of *how* consumption levels are maintained in the face of inadequate income is a critical one; but focusing on consumption rather than income ignores this. Thus consumption-based figures are likely to be more accurate than those of income; but it is important to remember that they are different from income figures, and have different implications.

Second, the dollars used for the \$1-a-day poverty line are not actual US (or for that matter Canadian or Australian) dollars, but 'international dollars', whose value is estimated at **purchasing power parity** (that is, in accordance with how much they will buy in each country). In principle, \$1-a-day doesn't mean an income of \$1 per day, but an income which will buy the same amount of goods and services that could be bought for an income of \$1 per day in the USA.

Third, the \$1-a-day and \$2-a-day poverty lines are **not at today's prices** – or indeed the prices of any other year. **Neither are they actually \$1 or \$2.** They were originally set at \$1 and \$2 at 1985 prices, but were subsequently changed to \$1.08 and \$2.15 (at purchasing power parity) at 1993 prices.¹³ While this adjustment is substantially less than inflation between 1985 and 1993, this line was considered by the Bank to be approximately equivalent to the original line. Not only are there questions about the equivalence between the old and new lines, however, but the effects of re-basing to 1993 prices raises serious issues about the whole approach.

The implications of these three issues for the reliability of poverty estimates are discussed later.

Problem 1: Exclusive focus on incomes/consumption

While income is a key dimension of poverty, it has many other dimensions. According to the 1995 World Social Summit Programme of Action:

*'Absolute poverty is a condition characterized by severe deprivation of basic human needs, including food, safe drinking water, sanitation facilities, health, shelter, education and information. It depends not only on income, but also on access to social services.'*¹⁴

Even in the material sphere, a household's savings or other assets are a key consideration in whether or not we would consider its members to be poor. Time poverty and working conditions are other, often neglected, aspects: to say that someone is not poor because he or she keeps his or her income just above the poverty line by working 16 hours a day 7 days a week in an unpleasant and/or dangerous occupation would seem perverse.

Lack of access to basic services, such as health, education, water and sanitation, is also an important element, as are housing quality and living environments: even with an income above the poverty line, someone living in a slum with no access to these services might well be considered poor. Poverty might also be seen as arising from chronic mental or physical illness or disability; from powerlessness, social exclusion or unequal gender relations; from illiteracy or lack of basic education; or from physical, social or economic insecurity. None of these factors is taken into account by the \$1-a-day poverty line, except to the extent that they impact on measured consumption.

Most of these factors are closely inter-related with lack of income, both as causes and symptoms, in a complex vicious circle. But this is by no means always the case – and, as Kakwani observes,¹⁵ 'it would be odd to call a disabled millionaire poor.' Kakwani concludes from this that 'poverty is present when basic capability failure arises because a person has inadequate command over resources' – that is, lack of basic capability can be construed as poverty only when it is *directly caused* by income poverty.

It is, however, far from clear that appealing to causality provides a satisfactory solution to the dilemma. Suppose, for example, that our hypothetical millionaire's disability arose from an occupational injury in a dangerous job which he was forced to take through poverty earlier in his life; but that he became a millionaire as a result of large-scale damages being awarded against his employer. The lack of basic capability is still a result of income poverty; but there is no obvious reason for this to affect whether or not we consider him poor.

Rather, it would seem a closer approximation to what we understand by poverty to say that we do not think the millionaire is poor because his income is *so far above* anything that could be considered income poverty as to make his income irrelevant. If the poverty-line were \$1 per day, and his income were \$1.01 per day, intuitively we might very well still consider him as poor as someone living on \$0.99 per day without a disability – either because his disability gives rise to additional costs (e.g. for a wheelchair, for increased transportation costs, or to pay for services others are able to perform for themselves), or because his quality of life is reduced for any given level of income.

The issue of non-financial dimensions of poverty suggests two possible approaches. One is to develop a **composite indicator** of poverty, which amalgamates income (or consumption) with other aspects of deprivation. This is the approach taken by UNDP's human poverty indicator. While useful as a supplement to income poverty data, however, this approach also has important limitations (Box 1), leading one analyst to conclude:

*'Important non-income aspects of poverty, such as deprivations in health, educational attainment and enjoyment of citizenship rights, cannot be meaningfully combined with consumption measures to define a comprehensive poverty indicator of relevance.'*¹⁶

Box 1: Composite indicators – the human poverty indicator

While there is a need for measures of income poverty, an important shortcoming of the \$1-a-day measure is that it neglects other important dimensions of poverty. This leads some analysts to argue that 'any indicator that identifies an individual as poor has to be multidimensional.'¹⁷

In 1997, UNDP sought to broaden the definition of poverty beyond income poverty by developing a composite indicator, the human poverty index (HPI).¹⁸ This combines three components, each given an equal weight:

1. Premature death (the percentage of people expected to die before the age of 40).
2. The adult illiteracy rate.
3. Standard of living (combining the percentage of the population without access to health services and without access to safe water, and the percentage of children under five suffering from malnutrition).

The HPI thus broadens the definition of poverty beyond income – in fact, it will be noticed that it does not include an income component. It combines a number of important indicators of the effects of the most extreme poverty, and provides a valuable additional indicator of national performance, together with income poverty indicators and the human development indicator (HDI). In effect, it provides a 'deprivational' counterpart of the 'conglomerative' HDI – that is, it indicates the proportion of the population who suffer severe absolute shortfalls of human development within a particular country rather than its overall level – in much the same way that income poverty indicators provide a deprivational counterpart to GDP per capita.¹⁹ At the same time, its potential to supplement income poverty indicators is demonstrated by the fact that, while the individual components of the index are strongly correlated with income at the country level, 'the correlation between income poverty and human poverty [in different countries] is weak, and there is a large spread in levels of human poverty among countries with similar levels of income poverty.'²⁰

As a poverty indicator in its own right, however, the HPI has a number of limitations.

- As the UNDP itself recognises, 'there is some inescapable arbitrariness' in the selection of indicators, and in their weighting.
- It does not distinguish between the *incidence* of poverty and its *depth* – for example, to take the extreme case, between a country where a different 30 per cent of the population qualifies as poor under each of the three criteria, so that 90 per cent are moderately poor, and a country where *the same* 30 per cent qualifies under all three criteria, so that 30 per cent suffer from acute poverty.
- It can only provide an aggregate picture of the extent of poverty in a particular country (or subnational population), and does not provide a means of identifying *which* households are poor.

Because it does not identify households or individuals as poor, except by each of the individual criteria, it does not allow a link to be made with incomes.

In consequence, while the HPI provides an important *complement* to income poverty data, it does not represent an effective *substitute*.

The problems of combining income and non-income dimensions of poverty into a single composite indicator suggests a second alternative: to consider other aspects of deprivation, such as disability, chronic illness, poor living or working environments, lack of access to basic services, insecurity etc., as **shifting the poverty line** for the individual or household concerned relative to those who do not suffer these deprivations, according to the impacts on well-being and/or additional costs associated with them. This principle, applied at the country level, underlies the rights-based approach we present later in this paper.

Whether or not they are linked with lack of income, the broader aspects of deprivation discussed in this subsection are clearly just as important to those they affect, and we certainly must not lose sight of them. Nonetheless, we would argue that we still need a distinct concept of income poverty as such. Within the broader context of deprivation, income is clearly a critically important aspect of poverty in its own right, and a major *source* (though by no means the only source) of most of the other aspects of deprivation among those who are in income poverty. It also represents a critical link with economic policies and performance, which represent the major *cause* of the extent, severity, distribution and evolution of global poverty.

Whether we use the word 'poverty' as shorthand for *income poverty* or for a broader definition of *deprivation* is a matter of terminology. Whatever we call it, the analysis of income poverty is a critically important aspect of any consideration of poverty in a broader sense. This, rather than the broader deprivation definition, is the one we use in this paper. We recognise, however, that income poverty lines should in principle be adjusted according to other aspects of deprivation; and this is implicit (at least at the country level) in the approach we develop later in this paper.

Problem 2: Arbitrary poverty lines

Even as a definition of income poverty, the \$1-a-day line is essentially arbitrary. It was established as a measure of poverty by the World Bank in the 1990 edition of its flagship publication, *The World Development Report*, focusing on poverty.²¹ It was selected as the median of the ten lowest poverty lines in a sample of 33 developed and developing countries (including only ten low-income countries).

As the chief architect of the Bank's poverty work readily (and repeatedly) acknowledges, 'this was deliberately a conservative choice.'²² In fact, while the \$1-a-day standard is applied to the developing world as a whole, using the median of the lowest ten poverty lines means that

*'Only five countries have poverty lines which are below this norm. The rest of the countries all have poverty lines above the \$1-a-day in 1985 PPPs. The \$1-a-day poverty line therefore may be more appropriate for measuring extreme absolute poverty in the poorest countries. For the range of incomes of countries normally included in measuring global poverty trends, the \$2-a-day poverty line is arguably a more appropriate indicator of extreme poverty on a global basis.'*²³

In any case, given how the analysis was conducted, as Kakwani and Son observe,

*'The Bank's claim that \$1-a-day is representative of poverty lines among low-income countries has a very weak foundation.'*²⁴

Specifically, many of the national poverty lines used were not official definitions but estimates from independent researchers; they were based on widely different methodologies; and, where more than one line was used (e.g. where separate lines were used for rural and urban areas), the lowest was used rather than the weighted average. Together with the selection of the ten countries with the lowest poverty lines, rather all the developing countries in the sample or even the ten poorest countries, this results in an artificially low figure.

Kakwani and Son also point out:

*'Since econometric analysis [based on these figures] failed to yield a reasonable international poverty line, the Bank then decided to determine the poverty line by eyeballing the scatter plot of [the econometric] equation.'*²⁵

Thus the process by which the \$1-a-day line was selected was essentially arbitrary. The primary motivation in choosing this figure appears not to have been that it provided a minimally adequate living standard, but rather a combination of the simplicity of the headline figure (leading to a line which could be described as a whole number of dollars) and a deliberate choice to use the most conservative definition (leading to the choice of \$1-a-day rather than \$2-a-day as the predominant line).

Problem 3: Over-sensitivity to base years

The process described above generated the original poverty line of \$1 per day, in purchasing power parity (PPP) terms, at 1985 prices. As noted above, however, the line has since been updated, based on new estimates of PPP exchange rates estimated for 1993.

Estimating PPP exchange rates requires a comparison of prices between countries; and this requires weights to be given to different goods and services, in line with their importance in consumption. However, consumption patterns change over time, so that the weights, and thus estimated PPP exchange rates, become progressively further out of line with reality. They are therefore updated periodically on the basis of revised weights.

However, the effects of this process demonstrate still more strongly the arbitrary nature of \$1-a-day line, leading poverty analysts to criticise the updating as giving rise to egregious errors,²⁶ and 'play[ing] havoc with the poverty estimates, changing them in ways that have little or nothing to do with the actual experience of the poor'.²⁷ Others have demonstrated that the results are 'highly sensitive to the arbitrary choice of PPP base year', which 'is completely irrelevant to anyone's standard of living',²⁸ and that 'poverty estimates for the same country and year can change dramatically purely as a result of shifting the base year'.²⁹

This raises serious questions about the whole approach, irrespective of which base year is used.

*'The poverty estimates that the Bank's method generates when applied with one PPP base year are inconsistent with those it generates when applied with another. This suffices to discredit the method even when it is always applied with the same base year... The discrepancies between the estimates yielded by two applications of the Bank's method [using 1985 and 1993 as PPP base years] are so large as to render this method unacceptable.'*³⁰

The extraordinary scale of the problem, as demonstrated by Pogge and Reddy, makes it clear why they and others consider the Bank's poverty estimates to be meaningless. The effect of the rebasing was to increase the estimated poverty rate in Sub-Saharan Africa by a quarter in 1993, while reducing that in Latin America by a third. Thus the ratio between the two nearly doubled, from 1.66 to 3.24, purely as a result of the change in base year.³¹ Global trends are also affected: whereas the global incidence of poverty fell by 4.23 per cent between 1987 and 1993 based on the 1985 PPP, it fell by only 0.57 per cent based on 1993 PPP.³²

The problem can be far worse at the country level. The result of updating the base year from 1985 to 1993 was to raise the poverty line for Nigeria in 1993 by 42 per cent, while lowering that for Mauritania by 61 per cent, changing the ratio between the two (in the same year) by a factor of 3.7. The effect on the estimated incidence of poverty is still more dramatic. Using the 1985 base-line, the Bank estimated the poverty rate in the two countries to be almost identical in 1999, at 31.1 per cent and 31.4 per cent respectively. Using the 1993 base-line the following year, it found that Nigeria's poverty rate was nearly 20 times that in Mauritania, at 70.2 per cent as compared with just 3.8 per cent.³³ For the application of the same method to the same data about the same people's income to give rise to such vastly different results, purely as a result of a changing the base year, amply demonstrates the shortcomings of this approach.

In view of these problems, Angus Deaton proposes setting an initial international poverty line, defining its equivalent in a particular year in each country (allowing some adjustment for local contexts), and simply increasing it progressively over time by local price inflation.³⁴ Srinivasan suggests a similar approach, but starting from the existing \$1-a-day line.³⁵ If combined with the development of appropriate price indices based on the consumption patterns of poor households both to establish the initial poverty lines and for subsequent adjustment, this would avoid the need to update the base year, and the serious distortions which arise from it – although the results would remain critically dependent on which base year was used to set the initial line.

In practice, however, the switch from 1985 to 1993 as a base year also significantly lowered the *level* of the \$1-a-day poverty line in real terms.³⁶ Keeping the \$1-a-day line equivalent to \$1 per day at 1985 PPP would imply increasing it in line with US dollar inflation between 1985 and 1993, to a figure of about \$1.30 per day at 1993 prices. Instead, the Bank recalculated the *original* poverty lines of the original sample of 33 countries at 1993 PPP exchange rates, and again took the median of the lowest ten. This process gave rise to a poverty line of just \$1.08 per day at 1993 prices. The median of more recent poverty lines in an alternative sample of 19 low-income countries indicates a figure in the order of \$1.50.³⁷

According to Pogge and Reddy:

*'The redefinition has lowered national poverty lines in 77 countries, containing 82% of the population of the 92 countries [for which PPP estimates are available] and raised national poverty lines in only 15 countries.'*³⁸

The net result was to reduce the recorded number of poor households in 1993 by 58 million – more than two-thirds as much as the estimated reduction in poverty between 1987 and 2001 based on 1993 PPP.³⁹

This is part of a more general problem, as shifting to a later base year can be expected to lower the poverty line progressively over time. According to Pogge and Reddy:

*'[Base year] adjustments are like [sic] to introduce a systematic bias toward painting too rosy a picture of global poverty trends. Adjustment of the base year reduces reported poverty headcounts insofar as international consumption is shifting toward commodities (such as services) that are very much cheaper in poor than in rich countries and away from commodities (such as food) that are not much cheaper in poor than in rich countries.'*⁴⁰

Applying a poverty line of \$1.30–\$1.50 to the World Bank's PovCal data⁴¹ would imply that an additional 10–15 per cent of the population of the developing world (some 400–700 million people) have been in poverty over the last 25 years than is indicated by the Bank's \$1.08 line. Moreover, while the *absolute* rate of reduction in the incidence of poverty has been similar, the higher absolute level of poverty means that this translates into a slower *proportional* rate of reduction, at around 2½ per cent per year compared with nearly 3½ per cent.

Problem 4: Implicit moral judgments

As noted above, the level of the '\$1-a-day' line is essentially arbitrary. This makes its use as a basis for policy particularly problematic because of the moral judgment embodied in poverty lines. As the Bank's leading poverty analyst observes:

*'Poverty lines are inherently subjective judgments people make about what constitutes a socially acceptable minimum standard of living in a particular society.'*⁴²

By adopting a particular poverty line for policy purposes, we are thus effectively saying two things:

1. It is morally acceptable for people to live at that level of income, so long as they do not live *below* it.

- Further increases in income beyond this level no longer matter from a poverty reduction perspective.

Because this judgment is generally unstated, however, the issue is rarely considered in moral terms.

There are a number of important factors to take into account in judging whether a dollar a day is enough for someone to live on in a developing country. The first trap is the assumption that it is easier to live on \$1-a-day in a developing country, because many prices are much lower. Because the \$1-a-day line uses PPP exchange rates, these differences are (in principle) already accounted for in the way the figures are calculated. Allowing for exchange rate changes and inflation, the \$1-a-day line is, in principle, equivalent to living on about £0.60 per person per day in the UK in 2007. This means a family of four living on an income of about £75 a month.

Second, we can all too easily assume that it is possible for people living on such low incomes to survive by scavenging in urban areas, or by enjoying the fruits of the land – hunting wild animals or collecting wild fruits, for example; or that they grow their own food; or that they receive food aid; or that they receive gifts or support from families or neighbours, beg or even steal.

Again, however, this is a fallacy. Since poverty is generally measured on the basis of consumption, not income, *anything* that is consumed is included, and valued at its market price, whether it is bought, found, scavenged, hunted, collected, received as a gift or charity, or stolen.

Even if one doesn't fall into either of these traps, one encounters a third problem in making a moral judgment about the \$1-a-day poverty line – that an income of £0.60 per person per day in the UK is so far below anyone's actual experience as to be unimaginable. In fact, it is in the order of *one-hundredth* of the average income in the UK. Looked at another way, it was equivalent to around 37 people living on a single minimum wage, with no recourse to welfare benefits in early 2006.⁴³ (In fact, as we discuss later, the equivalent incomes in the UK are actually considerably worse than these figures suggest.)

As a result, most people would not be in a position to judge whether the \$1-a-day line is consistent with their own moral values about what constitutes an acceptable standard of living, even if they were inclined to do so. (It also seems likely that most people never ask themselves the question.)

An alternative way of approaching this question is to consider what it actually means in practice to live at the \$1-a-day line, in terms of aspects of life on which people could be expected to have a definite moral opinion. This is a question which remained unaddressed until surprisingly recently, partly because of serious data limitations.

However, recent World Bank research does provide a first opportunity to make such a judgment. World Bank economist Adam Wagtsaff used the Bank's Poverty and Health dataset to estimate child mortality rates and under-nutrition at this level of income in different countries.⁴⁴ His results suggest that **between one in six and one in twelve of all children in households at (not below) the \$1-a-day poverty line in a typical developing country die before their fifth birthdays (compared with an average of around one in 160 in developed countries); and between one-third and half of those fortunate enough to survive are stunted through chronic malnutrition.**⁴⁵ Conditions are better than this in about a quarter of developing countries – but they are also even worse in another quarter.

Moral judgments are inevitably subjective in nature. At a time of unprecedented prosperity and conspicuous consumption among the better-off, however, it would seem surprising in the extreme if most people, asked directly, considered that it was morally justifiable for people to live at a level of income which resulted in the deaths of one-sixth or one-twelfth of all children before the age of five. It certainly does not seem consistent with the Right to Child Survival established by the 1989 UN Convention on the Rights of the Child Health,⁴⁶ or the right to the highest attainable standard of health, a founding principle of the World Health Organisation in 1946⁴⁷

enshrined in the International Covenant on Economic and Social Rights of 1966.⁴⁸ This suggests, at the very least, that there is a fundamental inconsistency between international standards in terms of poverty and of economic and social rights.

Problem 5: Inconsistent living standards

If we are to make moral judgments about poverty lines based on what it means in practice to live at a particular level of income, then there is a serious problem with the very concept of a global poverty line fixed in monetary terms, whatever notional exchange rate is used to apply it to individual countries, because the same level of income may give rise to very different living standards in different contexts.

However, for Martin Ravallion, the World Bank's leading poverty analyst and one of the chief architects of the \$1-a-day line, this is the very foundation of the definition and measurement of poverty.

*'When trying to make a global comparison of absolute poverty in terms of consumption, there is (in my view) a compelling case for using the same real consumption level as the poverty line in all countries.'*⁴⁹

This, for Ravallion (and the World Bank), is what comparability *means* in the context of poverty.

*'For our global poverty counts, we have but one overriding concern – that two people with the same standard of living, measured by command over commodities, be treated the same way no matter where they live.'*⁵⁰

As Adam Wagstaff's results on health standards at the \$1-a-day line demonstrate, however, there is a considerable difference between what it means to live with 'the same real consumption level' in different local contexts.⁵¹ This may partly be a result on the use of inappropriate conversion factors (as discussed in the next sub-section), and also with the arbitrariness associated with the choice of base year – as demonstrated by the Nigeria and Mauritania example highlighted above. The scale of the variation in our own results, however, presented later in this paper, as well as Adam Wagstaff's, suggest a larger problem than this.

This is not surprising, for at least three reasons.

- 1. Consumption needs** vary substantially between countries. For example, the amount of energy and clothing required is much greater in cold climates than in hot climates; the cost of household maintenance may be much greater in areas prone to floods and storms than elsewhere, etc.
- 2. Levels of social provision** vary widely between different contexts. While there is generally a significant association between household income on the one hand and access to (and quality of) health services and education on the other, different levels of provision and user costs mean that the level of access and quality associated with a particular level of income may be very different in different places.
- 3. In the case of health indicators, health risks** vary widely between countries and areas as a result of geographical and social factors, for example climatic conditions (particularly for diseases such as malaria and dengue fever), and poverty and limited access to health services (which increase the incidence of communicable diseases). This will result in a considerable variation, not only in the health outcomes associated with a given level of income, but also in the consumption required to maintain health at a given level (for example, through the need for treatment and for preventive measures such as mosquito nets).

As a result, the living standards associated with any specified level of income will vary widely between countries and contexts. This means that **applying a single poverty line defined in monetary terms to different countries is incompatible with defining poverty on the basis of living standards** – which is precisely what we are bound to do if our concern about poverty is based on the moral unacceptability of the *consequences* of living on extremely low incomes. A single global poverty line, wherever it is set, will *inevitably* mean either that some people

whose living standards are above the threshold of acceptability are classified as poor, or that some whose living standards are unacceptably low will be classified as not being poor.

Problem 6: Applying the global line to different countries

A further challenge to the principle of a \$1-per-day approach arises from the way in which purchasing power parity (PPP) exchange rates are estimated. As noted above, these were used both in the original estimation of the \$1-a-day poverty line, and in translating it into supposedly consistent poverty lines in each country.

As Ravallion emphasises:

*'If one is comparing living standards in terms of household consumption per capita then comparisons of absolute poverty across regions, sectors or dates can be misleading unless the poverty line has constant purchasing power (based on a cost-of living index appropriate to the poor).'*⁵²¹

However, because the PPP approach was designed for comparing national accounts figures (e.g. for total national income, investment or consumption) rather than for estimating poverty, PPP exchange rates are based on *overall* consumption patterns in the economy as a whole, rather than those of poor households. Since non-poor households account for the great majority of consumption, even where the poor represent a large majority of the population, PPP estimates reflect mainly the consumption patterns of the better-off, which are very different from those of the poor. As a result:

*'The use of such PPPs is quite inappropriate for poverty assessment and severely distorts the resulting poverty estimates.'*⁵³

Worse, this introduces a systematic distortion into the analysis. A much higher proportion of the spending of poor households is on food, and especially staple foods, than for better-off households – sometimes as much as 70–80 per cent. Conversely, non-poor households tend to spend a much larger proportion of their income on services. However, the high local labour content of most services means that they tend to be much cheaper in poorer countries, where wages levels are lower, whereas the price differences for foodstuffs between richer and poorer countries are generally much smaller. As a result:

*'Existing data about the prices of foodstuffs and, more specifically, of staple breads and cereals, show that these items (a large part of the consumption requirements of the poor) cost far more in poor countries than general-consumption PPPs suggest. The same is true for many basic necessities other than food.'*⁵⁴ This means that converting the \$1-a-day poverty line at the overall PPP exchange rate results in purchasing power well *below* \$1 in poorer countries in terms of the goods and services actually consumed by poor households, leading to serious under-estimation of the number of people defined as poor by this standard. Pogge and Reddy estimate that using an index for bread and cereal prices in place of overall PPP estimates would increase poverty lines in poor countries by an average of 30–40 per cent, suggesting a figure of around \$1.40–1.50 at 1993 PPP – broadly in line with the line resulting from adjusting the original (1985 PPP) \$1-a-day line in line with inflation.

Price indices based on the consumption patterns of poor households do not generally exist in developing countries. A project is currently being undertaken by the World Bank, however, in collaboration with the International Comparison Programme, with the aim of constructing such indices. This approach has the potential to bring significant improvements in the quality of poverty estimates, by reducing the role of irrelevant goods and services in the PPP conversion factors – although, as Reddy observes:

'This initiative fails to address other equally important shortcomings of current approaches to poverty estimation. Among these are the computation of prices from irrelevant countries in the construction of the PPPs, the lack of a meaningfully defined international poverty line, and the unreasonable

*dependence of poverty estimates upon the base year of the international poverty line.'*⁵⁵

There is also a problem of circularity: 'it is impossible to know what commodities the poor consume... without first identifying *who* the poor are'⁵⁶ – and this depends on how the poverty line is defined. This makes using the consumption patterns of 'the poor' as a means of defining the local poverty line problematic. More generally, the problem of standardising across the very different consumption bundles of poor households in, for example, Vietnam and Mexico, would remain intractable.

A second problem is that even the PPP exchange rates currently used suffer from important data inadequacies.

*'The general-consumption PPPs currently in use are based on limited and highly questionable evidence... As a result a massive element of guesswork and gap-filling underlies current poverty estimates.'*⁵⁷

Direct estimates of PPP exchange rates, based on actual price data, do not exist for all countries (about 60 for the 1985 dataset, and 110 for 1993). Figures for other countries are estimated indirectly on the basis of the estimated relationship of these rates with other variables such as GDP per capita. While a statistically significant relationship exists, this provides, at best, very approximate figures for other countries.

The level of uncertainty attached to PPP estimates can be gauged by comparing those used by the World Bank with the corresponding figures from the Penn World Tables (PWT6.1) produced by the International Comparison Project, the other major source of PPP exchange rates. The differences are very substantial, and sufficient to affect poverty estimates considerably according to which source is used.

*'Close to 50 per cent of the World Bank estimates diverge by at least 20 per cent on either side from the PWT6.1 PPP estimates in 1993. In more than 15 per cent of the countries the World Bank estimates are higher than the PWT6.1 figures by 40 per cent or more.'*⁵⁸

The problem of missing PPP data is particularly acute in terms of global poverty estimates because some of the largest countries are among those with limited or unreliable data.

*'No price surveys for constructing PPP prices are available for important countries such as China. For others – in particular, India – such surveys took place only in the distant past.'*⁵⁹

India last participated in a benchmark survey for PPP in 1985,⁶⁰ and according to Reddy and Pogge 'the current estimates of PPPs for China that are considered plausible differ by a factor of two.'⁶¹

Since India and China together account for 44 per cent of the population of the developing world, and more than half of the World Bank's estimates of total poverty at the \$1-a-day level (down from two-thirds in 1981), any inaccuracy in the PPPs for these countries could have a very considerable effect on the Bank's global poverty figures. The potential effect on the time trend of poverty is also considerable, particularly in the case of China.⁶² According to the Bank's estimates, the incidence of (\$1-a-day) poverty in China fell by more than five-sixths from 63.8 per cent in 1981 to just 9.9 per cent in 2004, while poverty in the rest of the world fell by only one-third, from 31.3 per cent to 20.7 per cent. While the number of people estimated to be below the \$1-a-day line in China fell by 80 per cent between 1981 and 2004, the estimated number in the rest of the world actually increased marginally, from 837 million to 841 million.⁶³

Problem 7: Updating the poverty line

A further problem arises from the need to adjust the poverty line, set at 1993 prices, for use in earlier and later years. This is done by converting the \$1.08 poverty line into local currency in 1993, using the PPP exchange rate, and adjusting it in line with a national price index (e.g. the consumer price index). However, this use of general prices indices generates similar problems to those caused by the use of

general PPP exchange rates, because again such price indices are based on total consumption, and thus primarily reflect the consumption patterns of the better-off.

This can be demonstrated by the effects of recent major increases in cereal prices, largely as a result (directly or indirectly) of increased biofuel production. In March 2008, the world prices for major cereals (rice, maize, wheat and sorghum) were around double their average levels in 2006.⁶⁴ For the poorest households, such staples may already account for more than half of their expenditure, so that doubling the price represents a very considerable increase in their living costs. But for the population as a whole, staples represent a much smaller part of total spending; so, since the inflation rate is calculated on the basis of overall consumption, a doubling of cereal prices might add only 5 per cent to the price index. Adjusting the poverty line by the overall inflation rate would then increase it from (say) \$1.00 to \$1.05, although a poor household's income would need to rise to \$1.50 to maintain the same level of consumption.

A second problem is that national price indices do not necessarily apply equally in all areas – and particularly as between rural and urban areas, where prices may change at significantly different rates. (They may also differ markedly between regions, e.g. due to differences in dietary patterns and food availability.) Thus:

*'India's official poverty estimates, which use price indices for updating, show diverging trends in urban and rural poverty between 1987–88 and 1993–94. When these estimates were recalculated using commodity weights and unit values based on household surveys, no great difference was found in the rate of decline of urban and rural areas between those years.'*⁶⁵

In other words, the appearance of a relative increase in rural poverty arose purely because an overall price index was used rather than separate ones for rural and urban areas. The global figures are also distorted by not taking account of rural-urban differences in living costs. In presenting the World Bank's latest estimates, Chen and Ravallion estimate the impact of this effect:

*'More than 100 million people are added to the global count of the [\$1-a-day] poor when we allow for the higher cost of living in urban areas, and about half of the 100 million come from South Asia and one third from [Sub-Saharan Africa].'*⁶⁶

While Chen and Ravallion's finding that this 'makes much less difference to the trends over time' is true in aggregate, this masks significant effects at the regional level – and in all probability still stronger effects at the national level. Thus one-third of the apparent reduction in poverty in Sub-Saharan Africa between 1993 and 2004 appears to be a result of the failure to take account of rural-urban price differences. While the Bank's headline figures suggest that the proportion of people in Africa below the \$1-a-day line fell from 45.5 per cent to 42.6 per cent, correcting for rural-urban price differences indicates both a higher level and a smaller reduction, from 49.2 per cent to 47.2 per cent.⁶⁷

Problem 8: Filling the gaps

PPP exchange rates are not the only area in which directly estimated data are missing, and other means have to be found to fill the gaps – or where the methods of doing so raise important questions about the reliability of the Bank's estimates of levels of, and changes in, poverty. There are also major gaps in data on incomes, because the household surveys on which poverty estimates are based are generally conducted only at long and irregular intervals. In order to reach global (or even regional) estimates of changes in poverty over time, it is therefore necessary to estimate poverty between, before and after these observations.

Estimating poverty rates *between* surveys is relatively unproblematic – this is done on the basis of the survey before and the one after, assuming that actual incomes changed in line with the pattern of overall economic growth between the two. This is not necessarily accurate, because actual changes in poverty will also reflect changes in income distribution, which may vary over time; but it should generally provide a reasonable approximation.

Much more serious problems arise, however, from estimating poverty rates before the first household survey and after the last. This is done on the basis of the overall growth rate of consumption in the national accounts statistics, keeping the distribution of income constant. This is problematic for two reasons.

First, and most obviously, it ignores changes in the distribution of income. Since most countries (developed as well as developing) have seen a systematic increase in inequality since 1980, in marked contrast with the previous 20 years,⁶⁸ this is likely to result in a significant over-estimation of the rate of reduction in poverty.

The second problem is that there is a very substantial difference between consumption as measured by national accounts statistics and as measured by household surveys. More seriously, the gap between the two is widening consistently over time, as the national accounts measure is growing substantially faster than the household survey measure.^{69,70} Thus simply using the growth rate from the national accounts statistics without adjusting it to compensate for this difference, means that increases in household incomes – and thus the reduction in poverty – will be systematically over-estimated.

The Bank's estimates effectively assume that the discrepancy between the two consumption measures arises primarily because of under-reporting by better-off households in household surveys, so that poverty data are not substantially affected.⁷¹ The divergence, however, almost certainly also arises at least partly because the definition of consumption in the national accounts statistics is different from that used in household surveys.

Specifically, national accounts statistics on consumption include expenditure by non-profit organisations and imputed rents for accommodation (the rental value of owner-occupied properties) which are not generally included in the household survey/poverty definition; and they do not effectively capture subsistence production and informal sector activity. The latter is particularly important because these are often the most important sources of income for the rural and urban poor respectively. Equally, expenditure by non-profit organisations may well be substantially greater (particularly relative to total consumption) in low-income countries, where the incidence of poverty is greatest, than it is in middle-income countries.

Thus the figures for the earlier and later parts of the period covered by the Bank's global poverty estimates (1981–2004) are based on systematically over-optimistic estimates both of the growth rate of consumption and of changes in its distribution. Even in the absence of the other problems highlighted above, this would impart a significant optimistic bias both to the estimated rate of poverty reduction and (to a more limited extent) to the current level of poverty for any given poverty line.

This does not substantially affect the results for India or China, both of which have survey data for 1980 or 1981 and for 2004 (that is, for the beginning and the end of the period covered by the World Bank's latest global poverty estimates) – although, as discussed previously, there are substantial problems with the estimates for these countries as a result of the estimation of their PPP exchange rates. (There are also some questions about the reliability of the survey data for China in the 1980s.⁷²)

Elsewhere, however, the issue is a serious one, especially in the 1980s, when the number of surveys conducted was particularly limited. There are almost no actual data for Sub-Saharan Africa or Eastern Europe and Central Asia before the late 1980s, and few for the Middle East and North Africa.⁷³

The scale of the problem can be assessed by considering the proportion of total estimated poverty accounted for in each year by countries where lack of survey data means that the forward or backward projection method must have been used. In 1981, 97 per cent of total poverty outside China and India (at the \$1-a-day level) appears to have been estimated in this way. Only from 1987 is even a quarter of the total based on actual survey data or estimates based on surveys before and after the year in question. The problem in the most recent years is limited to some extent by the increased frequency of household surveys; but in 2004, the latest available

estimate, 90 per cent of \$1-a-day poverty outside India and China was estimated by forward projection.

Two other points are noteworthy in this context. First, it is inevitable (barring a very considerable increase in the frequency of household expenditure surveys) that the Bank's estimates of poverty outside India and China for the most recent years will *always* be based very largely on forward projections. The optimistic bias of this method therefore suggests that they will consistently tend to present an artificially favourable picture of recent developments, exaggerating any acceleration in poverty reduction or concealing any deceleration or reversal.

Second, the absence of reliable estimates for the 1980s is particularly unhelpful because of the considerable uncertainty surrounding poverty during this period, when the debt crisis first struck, and the first and most painful phase of structural adjustment took place. This issue is particularly acute in Sub-Saharan Africa, where nearly 90 per cent of estimated poverty prior to 1987 (and 60 per cent in 1987–1990) was based on backward projections from later household surveys. This suggests that even the Bank's estimate of the increase in poverty during this period (from 42.3 per cent in 1981 to 47.2 per cent in 1987) is likely to understate the true impact.

Conclusion

At first sight, the \$1-a-day poverty line might appear to provide a clear and easily understood way of defining and measuring poverty consistently on the global level. In practice, however, it is far from clear, and prone to misinterpretation by the uninitiated. It is inconsistent between countries and over time, highly sensitive to relatively minor changes in methodology which should make no difference, and prone to serious methodological and analytical problems; and there are a number of serious gaps in the data which can at best be filled only very approximately.

While some of these problems merely give rise to major uncertainties regarding the true picture, some lead systematically to an under-estimation of the extent of poverty or over-estimation of the rate at which it is falling, and others to distortions in the pattern of poverty between poorer and less poor countries. The scale of these problems is such that this approach cannot be considered to provide a reliable basis for estimating the extent, severity, distribution or composition of poverty, or of trends over time.

All of these problems arise (more or less) equally, irrespective of the actual income level at which the poverty line is drawn. In addition, the \$1-a-day line itself is essentially arbitrary, and clearly does not provide a standard of living which could reasonably be regarded as morally acceptable in an era of unprecedented prosperity for the better-off. More generally, because of the wide differences in the living standards associated with a given level of income between countries, this type of approach would appear to be incapable of generating a poverty line which genuinely reflects a morally-based definition of poverty, in any meaningful sense, in a consistent way across countries.

In short, ***the current approach to poverty estimates does not provide an adequate basis either for the estimation of poverty as it is (or appears to be) currently defined, and still less for a morally based definition. An alternative approach is urgently needed.***

Alternative approaches

In the light of the serious problems discussed earlier, it is difficult to disagree with the dismissive statements about the \$1-a-day line already quoted, or that an alternative is needed which both provides a truer picture of the actual situation and better reflects the moral content implicit in the concept of poverty.

This suggests the need for a different approach to defining and measuring poverty, which:

- takes effective account of non-income aspects of poverty (while also ideally being measured in terms of income);
- corresponds with equivalent living standards in different countries and contexts;
- sets a threshold for poverty at a standard of living which might reasonably be considered as morally acceptable; and
- avoids the technical problems associated with purchasing power parity exchange rates and price indices.

In considering alternatives, we start from the concept of poverty as a moral issue – that a household should be defined as (income) poor if its income is insufficient to achieve what is considered to be a minimum morally-acceptable standard of living. There are various ways of translating this type of approach in practice, which can be summarised in terms of two key distinctions.

1. One can distinguish between **input definitions** of poverty, based on estimating *the level of income required* by a household to achieve a consumption pattern that provides an adequate standard of living; and **outcome definitions**, based on the *living standards actually achieved* by households at a given level of income.
2. One can either define a **single universal poverty line**, defined in money terms at the global level, which is then converted into local currency units in each country; or a set of consistent **national poverty lines**, defined according to specific local contexts, in such a way that they correspond with equivalent *living standards* in each country.

This typology is illustrated in Table 1.

Input-based approaches

As Ravallion notes, going back to Rowntree's work in the UK in the late nineteenth century:

'The most common approach in defining an absolute poverty line is to estimate the cost of a bundle of goods deemed to assure that basic consumption needs are met in the specific domain of the poverty comparison. The difficulty lies in identifying what constitutes 'basic needs.''⁷⁴

The first problem is that of defining what minimum consumption needs *are* in any universal sense, for example by reference to basic human needs. This is, in principle, feasible for absolute physical needs, such as nutrition, protection from the elements, health care and physical security. The question here is, primarily, where the threshold should be drawn – although this is by no means always as straightforward as it might first appear, as discussed later in the context of nutrition.

Table 1: Typology of morally-based approaches to the definition of poverty

	Input-based			Outcome-based		
Universal poverty line	International Food Poverty Line (IFPL)	Nanak Kakwani and Hyun Son ⁷⁵	nutrition	Ethical Poverty Line (EPL)	Peter Edward ⁷⁶	health (narrow definition)
Country-specific poverty line	Minimum Income for Healthy Living (MIHL)	Jerry Morris <i>et al</i> ^{77,78}	health (broad definition)	Rights-Based Poverty Line (RBPL)	David Woodward and Saamah Abdallah ⁷⁹	multiple criteria (child survival as illustration)
	Global Capability-Based Approach (GCBA)	Sanjay Reddy <i>et al</i> ⁸⁰	multiple criteria (nutrition as illustration)			

Human needs go far beyond this most basic physical level, however, and simply defining a set of goods which a household requires merely for its continued physical existence excludes equally fundamental needs, such as social interaction and mental stimulation. Even people unable to fulfil their physical needs may well value the fulfilment of such non-physical needs as highly as what might, to an outside analyst, be considered ‘necessities’.

Moreover, even if we could define both needs and appropriate thresholds in a meaningful way, the bundle of goods and services which would be required to *fulfil* these needs would differ very considerably between – and often within – countries, for example between hot and cold climates, between rural and urban areas, or according to the local availability of different basic foods. It would also differ between households within a particular locality according to their demographic composition. For example, the number and ages of children have a major effect on the types and quantities of foods (and other products) a household requires. (See Box 2 later.)

As a result, even within a particular national context:

‘Unavoidably, determining which goods and services are to be included in a poverty bundle, and in what amounts, is an arbitrary decision.’⁸¹

One might even question the *concept* of such ‘absolute’ needs, and consider that it is only coherent to consider what it means to be poor in a particular socio-cultural context. This view has a longer pedigree even than Rowntree’s subsistence approach.

‘In defining necessities, Adam Smith argued that one must include, not only necessary commodities but also those which ‘the custom of the country renders indecent for creditable people even of the lowest order to be without.’⁸²

A comprehensive input-based approach: Morris et al’s Minimum Income for Healthy Life (MIHL)

Perhaps the most rigorous approach to developing a country-specific input-based poverty line is the work by Jerry Morris *et al.* at the London School of Hygiene and Tropical Medicine. Taking as their starting point ‘attainable levels of health as a human right and prime goal of society’,⁸³ Morris *et al.* first define a demographic group, and assess its material needs for a healthy life, covering diet and nutrition, housing, physical activity, medical care and social integration, based on epidemiological evidence (supplemented by ‘pragmatic judgments’). They then translate this into a poverty line on the basis of estimated ‘cautious pragmatic, representative minimal costs per week’.⁸⁴

They have applied this approach to two groups: 'single, healthy men, 18 to 30 years, living away from their family and on their own' in the UK,⁸⁵ and 'people aged 65 and above, living independently (i.e. in non-assisted housing), retired from employment and without significant defined disability' in England.⁸⁶ For 18–30-year-olds, they found costs varying between £106.47 and £163.86 per week (average £131.86) in different regions at 1999 prices; and for people over 65, £131 for a single person, and £208 for a couple in April 2007.

It will be noted that these poverty lines are far above any considered in the context of developing countries. In fact, they are in the order of \$25–50 per person per day. Moreover, even setting aside the issue of appropriate price indices, this comparison actually understates the difference significantly, because the HMIL figures exclude subsidies such as free health services, free or subsidised public transport (for people over 65 in many areas) and free television licences (for people over 75).

The scale of this difference largely reflects the much higher standards of living which are regarded as the minimum acceptable in developed than in developing countries. Thus among the costs included for those over 65, under the heading of 'psychosocial relations/social inclusion/active minds', are:

'a telephone, occasional gifts to grandchildren and others, modest recreational and entertainment costs, membership fees, a television set (and licence for those under 75), a daily newspaper, an annual UK holiday and a little money for hobbies.'

While such social needs are (largely) taken for granted in the developed world, their consideration in the analysis of poverty in developing countries is virtually unheard-of.

Morris *et al's* approach also highlights the high level of specificity which is required for a comprehensive needs-based approach. The goods and services required by 18–30-year-olds are very different from those of people over 65. Moreover, the latter group excludes 40 per cent of older people who have disabilities, and therefore 'are likely to have extra personal costs that require further *ad hoc* study'. Within the 18–30 group, there are wide regional variations (largely as a result of housing costs), the highest-cost region indicating financial needs 50 per cent above the lowest for an equivalent living standard.

The results also raise questions about the use of *per capita* consumption as a basis for applying a poverty line: it will be noted that the per capita cost for a couple over 65 (£104) is substantially less than for a single person (£131) – although single-person poor households are likely to be much less common in most developing-country settings than in the UK.

The MIHL approach is probably the most comprehensive attempt yet to evaluate a country-specific poverty line based explicitly on consumption needs – although some arbitrariness inevitably remains in the assumptions about both the consumption basket and the prices. No equivalent appears to have been attempted in a developing-country setting, no doubt partly reflecting the very considerable data requirements, and the extent of the analysis required to estimate poverty lines specific at a sufficient level of regional and demographic disaggregation.

This may also reflect in part the implicit abandonment of the right to health in the developing world in the face of poverty on a scale which makes it unthinkable in any meaningful sense for the majority of the world's population. At best, considerations of health in this context fall far short of the definition established by the constitution of the World Health Organisation in 1946: 'not merely the absence of disease, but a complete state of physical, mental and social well-being'. In relation to developing countries, the definition rarely extends beyond 'the absence of [physical] disease', and is often still more narrowly drawn in terms of mortality.

Food-based input approaches: general considerations

With the notable exception of Warren *et al*'s MIHL approach, as described above, input-based approaches to poverty are in practice almost invariably based on nutritional needs. This largely reflects the serious constraints of data and analytical capacity in developing countries, and:

*'the absence of any consensus on what non-food capabilities are of concern, on the characteristics of the commodities which promote them, on the transformation function that relates these characteristics to capabilities, and on the levels of each capability that ought to be deemed minimally adequate.'*⁸⁷

Nutritional needs, in turn, are generally simplified to the fulfilment of calorie requirements, which can readily be assessed on the basis of food purchases, using standard calorific values.

The general approach is to assess minimum nutritional needs (generally based on average calorie requirements); to estimate the cost of this, on the basis of the average cost of food per calorie of a reference group of the population; and to add an allowance for non-food expenditure, based on actual expenditure patterns among poorer households. Two such approaches are discussed below.

In practice, however, this process is less straightforward than is often assumed. First, reducing nutritional needs to calorie requirements is a serious oversimplification, as calories are only one aspect of nutritional requirements. From a health perspective, an adequate nutritional intake also depends on other attributes of food, such as its contents of protein, vitamins, minerals and other micronutrients. For households with young children, especially while weaning, energy density is also very important.⁸⁸

It also neglects other aspects of food which may also be valued by households as much as their nutritional content, even if they are below minimum calorie intakes, for example taste, variety⁸⁹ and time required for preparation.

Such differences among foods in terms of non-calorie attributes (nutritional and non-nutritional) give rise to a considerable variation in average costs per calorie between income levels, even below the level at which adequate nutritional intakes are reached. In the case of Bangladesh, for example, Kakwani and Son find that the cost per 1,000 kilo calories to the richest 20 per cent of the population is 2½ times that of the poorest 20 per cent.⁹⁰ This makes it critically important which income group is used as the reference group to estimate per calorie costs.

Secondly, even calorie requirements vary considerably between individuals, notably according to age, gender, pregnancy and lactation, levels of physical activity and health status. This is of particular importance because these factors vary systematically – though in different directions – with household income levels (see Box 2).

While demographic considerations are likely to reduce the calorie requirements of poor households relative to the population as a whole, health and activity levels will have the opposite effect, so that the overall effect will be determined largely by the balance between the two. While the scale of the effects suggests that the net effect could be substantial, it may vary considerably between different contexts.

It is clear, however, that these effects will tend to distort findings on the *composition* of poverty. Specifically, it is likely to result in methods based on national averages for nutritional requirements under-estimating poverty in rural and mining areas and in areas with a high incidence of parasitic and other diseases; and to over-estimate it among families with above-average numbers of children, female-headed households and among older people.

Box 2: Individual variations in calorie requirements and relationship with household income

Calorie requirements vary substantially between individuals in ways that are significantly linked to income levels.⁹¹

- **Age:** children require fewer calories than adults, rising from 950 at age 6–12 months to 2210 (female) and 2895 (male) in adulthood. To the extent that the proportion of children is higher in poorer households, this will tend to *reduce* calorie requirements at lower incomes. Conversely, requirements fall after age 60, by 30 per cent for men and by 17 per cent for women. The effect here is *ambiguous*: since life expectancy is shorter at lower income levels, one might expect fewer over-60s in poorer households; but the more limited earning potential of the elderly puts them at higher risk of poverty.
- **Gender:** the calorie requirement for an active adult man is some 30 per cent higher than that for an active adult woman, with smaller differences for children from the age of 10. To the extent that households without an adult male breadwinner are more likely to be among the poor, this may on average tend to *reduce* calorie requirements among the poor slightly relative to the non-poor.
- **Pregnancy and lactation:** women's calorie requirements are increased by 9 per cent during pregnancy, and by 23 per cent during lactation. To the extent that poorer households on average have higher fertility rates, this will tend to *increase* calorie requirements among the poor, partly off-setting the effects of their higher proportion of children. Pregnancy and lactation also substantially increase needs for protein and micronutrients, and hence per-calorie costs for an adequate diet.
- **Activity:** people who expend more energy require a commensurately higher energy intake; and the work of poorer households is typically much more physically demanding than for the better off (especially in agriculture, but also, for example, in mining, construction and other hard physical labour). A larger proportion of the members of poorer households, including women and children, are also likely to be economically active, often in such occupations, than at higher income levels. Similarly, 'economically inactive' women in poor households also typically have to expend much more energy on very physically demanding activities such as pounding basic foods, carrying water over long distances, growing food crops for household consumption, etc. This is likely to *increase* calorie requirements considerably among poor households.
- **Health:** ill-health, and especially chronic or repeated ill-health, requires substantially higher calorie intakes to achieve a given nutritional outcome (as measured by anthropometric indicators such as height-for-age, weight-for-age and weight-for-height). Of particular importance are some parasitic diseases, which may substantially reduce the nutritional value to the body of a given intake of calories and other nutrients. Since poorer households typically suffer considerably higher burdens of disease (not least parasitic diseases) than the better-off, this can be expected to *increase* their calorie requirements substantially.

There is also a more fundamental challenge to calorie-based approaches, in terms of the hierarchy of human needs.⁹² Calorie consumption, together with drinking, is the most basic human need which requires financial resources (others, such as breathing and sleep, being costless). The imperative for survival therefore means that some level of calorie intake (though not necessarily the notional minimum requirement) will be met, if necessary, at almost any cost in terms of other needs.

If, however, we are interested in a broader definition of income poverty – that is, if we think that people also have a moral entitlement to the fulfilment of material needs other than an adequate calorie intake – then this does not provide the appropriate criterion. Rather than setting the poverty line at the point where the *first* human priority is met in full, we should be seeking to define the poverty line as the point at which the *last* of the needs which we consider to be an entitlement is fulfilled. On this basis, by definition, a poverty line based on calorie intake inevitably represents a minimalist approach to defining a 'moral poverty line'.

Food-based approaches – two illustrations

Two recent proposals for input-based poverty lines using the approach outlined above are noteworthy. Kakwani and Son's 'International Food Poverty Line' (IFPL) approach estimates a food poverty line for an 'anchor country' (Bangladesh), which is then used as a basis for estimating poverty lines in other low-income countries.⁹³ The median of these lines (\$1.22 per day at 1993 PPP) is then used as a global poverty line.

While the resulting poverty line is less arbitrary than the \$1-a-day line, it has three problems (beyond those inherent in calorie-based approaches).⁹⁴ First, Kakwani and Son base the food poverty line on the cost per thousand kilocalories of the poorest 20 per cent of the population, rather than of households which have adequate calorie intakes. This results in an artificially low food poverty line; and, since the non-food component is based on this figure, it too will be artificially low.

Secondly, while the theoretical part of their paper rests on using PPP exchange rates based on food prices, they appear to use general PPP exchange rates in their actual estimates. As noted above, this will result in poverty lines being under-estimated in countries poorer than the anchor country, and over-estimated in less poor countries. Even using food PPPs, the problem remains that these will be dominated by the consumption patterns of non-poor households and therefore may not accurately reflect differences in food costs to the poor. This will distort the conversion of the food poverty line between countries.

Thirdly, there is the general problem of using a global line: those countries where the estimated poverty line is above the median level will have a poverty line below the level appropriate to that country on nutritional grounds, while those where the line is below the median will have a line higher than would be appropriate.

These problems are dealt with better by Reddy *et al.*'s proposed Global Capability-Based Approach to poverty. Reddy *et al.* avoid the last two problems by proposing the use of country-specific lines, estimated on a consistent basis for all countries. They also use food expenditure at the level of income where (average) calorie requirements are met, thus avoiding the first problem. This results in a much wider range of poverty lines than found by Kakwani and Son: while the ratio between the highest and lowest of the 19 national poverty lines estimated by Kakwani and Son is 1.55, the corresponding figure for the three countries considered by Reddy *et al.* is more than double this, at 3.4.

If, however, our primary interest in poverty arises from the living standards it results in, the real test of a poverty line based on nutrition is to compare its results against nutritional outcome indicators – and this raises serious doubts about both approaches.

In Figures 1 and 2, we compare the incidence of poverty implied by Kakwani and Son's 19 estimated national poverty lines (as applied to the World Bank's PovCalNet database⁹⁵) in each of the years in which income data are available, with World Bank figures for the incidence of malnutrition in each country for the nearest available year, in terms of height-for-age and weight-for-age.⁹⁶

Two features stand out from these graphs. First, there is no systematic relationship between the proportion of households defined by Kakwani and Son's method as poor, and the proportion of children who suffer from malnutrition. In fact, the countries with the highest rates of malnutrition have 'food poverty' rates in the middle of the distribution, while those with the highest rates of 'food poverty' have average (height-for-age) or below-average (weight-for-age) malnutrition indicators. This suggests that the method does not effectively reflect differences in purchasing power or nutritional standards between countries.

Second, the incidence of malnutrition is higher than the estimated incidence of poverty (indicated by points above the red line) in around a third of cases for height-for-age, and a quarter for weight-for-age. This means that, in some countries, many children are classified as nutritionally non-poor despite being seriously malnourished – particularly as the relationship between household income and nutritional outcome indicators is far from exact. By any reasonable standard, one would expect even moderately under-nourished children to be classified as poor, so that all the points on the graph would be significantly *below* the red line. This is an unequivocal indication that the poverty line is set at much too low a level in many countries.

Judging Kakwani and Son's results for Bangladesh against this criterion would appear to confirm that this results at least partly from setting the poverty line in the anchor country too low rather than from the process used to convert this line for other countries. Based on World Bank data,⁹⁷ their estimated poverty line of \$1.23

Figure 1. 'Food poverty' and malnutrition (height/age)

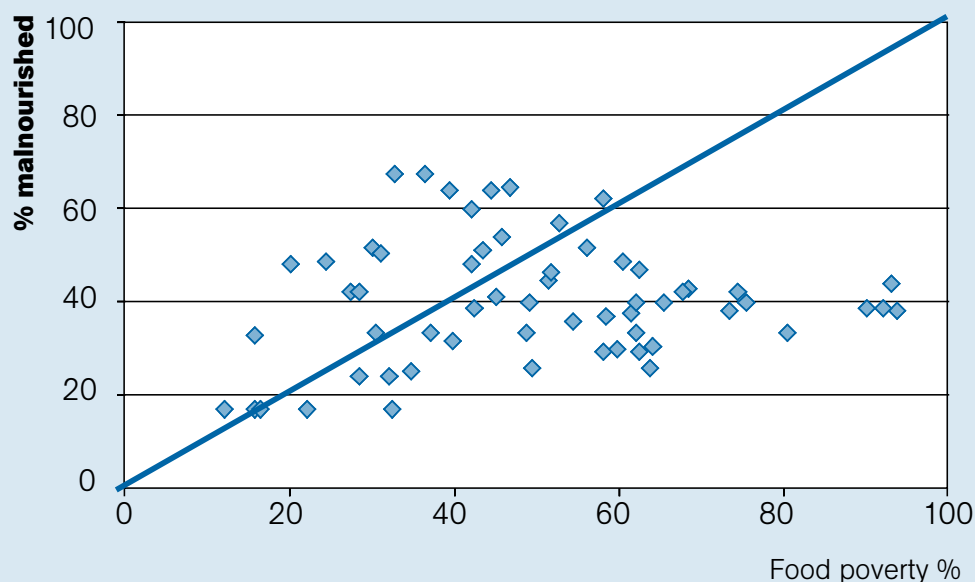
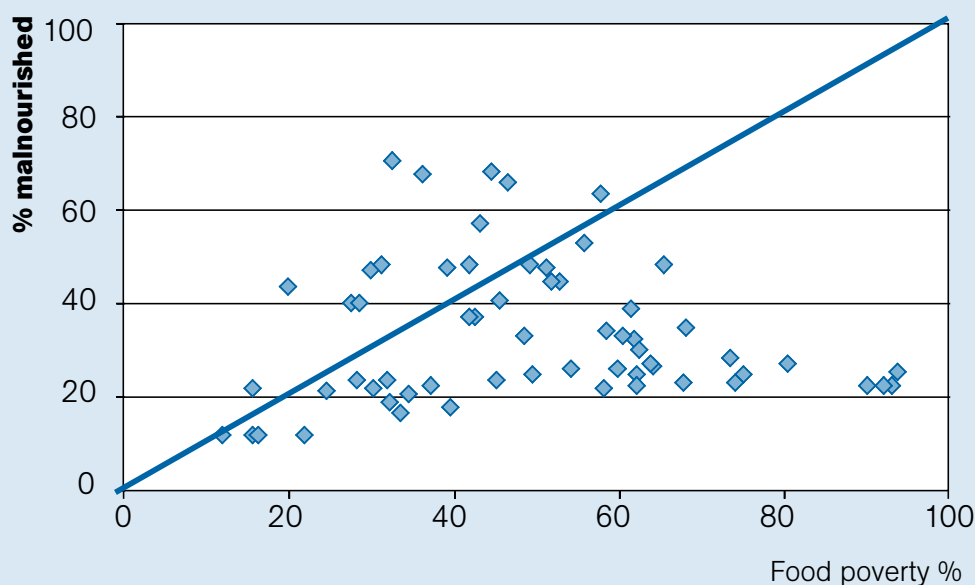


Figure 2. 'Food poverty' and malnutrition (weight/age)



per day at 1993 PPP suggests that 51.5 per cent of Bangladeshis were poor in 2000. This is only marginally above the incidence of malnutrition: in the same year, 45 per cent were malnourished in terms of height-for-age and 48 per cent in terms of weight-for-age.⁹⁸ Moreover the substantially higher figures for 1999 and 2001 (55 per cent and 49 per cent for height-for-age, and 61 per cent and 52 per cent for weight-for age) suggest this is likely to understate the true extent of malnutrition, as both indicators generally change relatively slowly over time.

Comparison with nutritional outcome indicators also cast doubt on Reddy *et al's* results. They estimate surprisingly low poverty lines of only \$0.54 per day for Tanzania and \$0.75 for Nicaragua (at 1993 PPP); but even at a much higher income of \$1.08 per day, 36.4 per cent of children are estimated to be malnourished in terms of weight-for-age in Tanzania and 21.8 per cent in Nicaragua, and the proportions malnourished in terms of height-for-age are 48.4 per cent and 43.2 per cent respectively. Moreover these figures are significantly above the national average in Tanzania, and around double the average in Nicaragua, clearly indicating that this is poverty-related.

Corresponding figures are not available for Vietnam, the third country in their analysis. While the estimated poverty line is substantially higher at \$1.84, however, the incidence of poverty this implies is well below the national malnutrition rates – 28.9 per cent in 1998, compared with 36 per cent malnutrition in terms of height-for-age and 40 per cent in terms of weight-for-age. Again, this means that a substantial proportion of people are classified as non-poor by this measure despite suffering from malnutrition.

Global versus country-specific poverty lines

Until relatively recently, poverty lines were defined at the country level – and national poverty lines are still widely used. However, the growing awareness of, and concern about, poverty as a global problem, increasingly affected by a globalising international economy, led to a desire for a standard definition, so that poverty could be aggregated and compared between countries on a consistent basis. This was not possible using national poverty lines, as there was no common method for setting them, so that both the income levels at which they were set and the living standards they afforded varied widely between countries. This led to the development of the \$1-a-day poverty line as a common global standard – with all the limitations discussed above.

From a moral perspective, however, the concept of a single global poverty line defined in money terms, is problematic. The reason we are concerned with poverty is not merely that the incomes of the poor are below a certain amount, but that the standards of living which their incomes afford are below a level which we consider to be morally acceptable. A morally-based definition should therefore reflect a common minimum living standard in all countries. However, since the same level of income inevitably gives rise to different living standards in different countries, a single universal line cannot satisfy this condition.

The World Bank's highly influential leading poverty analyst, Martin Ravallion, envisaged the possibility of developing country-specific poverty lines as a means of dealing with this problem as long ago as 1992.

*'One way of dealing with the possibility that the living standards indicator does not properly reflect differences in well-being at a given consumption level is to set different poverty lines.'*⁹⁹

UNDP appears sympathetic to the idea, but has not pursued it for practical reasons.

*'An alternative [to a universal poverty line] is to use different poverty lines in different countries. But it is not easy to decide what the appropriate variations would be and how the respective poverty lines could be estimated... The general need for a variable cut-off line of poverty is easier to appreciate than it is to find adequate values for variable poverty lines in different countries.'*¹⁰⁰

The problem is one of consistency. While national poverty lines are widely used, there has been little attempt to develop such standards in an *internationally consistent* way, so as to allow aggregation and comparison across countries – perhaps partly reflecting Ravallion's own rejection of the idea as:

*'a rather restrictive way of dealing with differences in needs, since it need not yield meaningful comparisons across different needs groups for those below the poverty line; comparability is only assured at the poverty line.'*¹⁰¹

This no doubt reflects Ravallion's own starting point for his discussion of the issue, which (as noted above) is explicitly based on standardisation in terms of the real value of consumption, somehow defined, rather than standards of living in a broader sense.

Ravallion's concern about comparable measurement of well-being *below* the poverty line applies primarily to the question of defining, comparing or aggregating the *depth* of poverty across different contexts. However, it is not

obvious that this is fundamentally problematic even in this context. Even with country-specific poverty lines, it is possible to measure and compare poverty gaps in the same way as a universal poverty line.

Moreover, given the advantages of a country-specific approach in setting a poverty line comparable in terms of *why* poverty matters, it is not clear that this is an adequate reason to reject such an approach. In defining the *extent* of poverty, the primary consideration should be to set the poverty line in a way which reflects our reasons for setting it at all. This condition is fulfilled much better by a set of poverty lines applicable to different contexts according to the specific conditions of each, based on a consistent methodology designed to take account of relevant considerations, than by a single poverty line set in monetary terms, applied universally irrespective of local conditions.

Outcome-based approaches

As discussed above, input-based approaches to setting poverty lines in developing countries are almost invariably based on estimates of the cost of adequate calorie intakes; and this approach does not appear to perform well against the yardstick of nutritional outcome indicators. This suggests that, if we are seeking a poverty line which will better reflect outcomes, we need to rely on outcome-based rather than input-based definitions of poverty. If applied on a country-specific basis, such an approach could also provide a means of resolving the problem of variations in the living standards associated with a given level of income in different countries. It is, however, also possible in principle to develop a global poverty line on this basis, and we consider such an approach below.

A number of outcome indicators could be used as a basis for setting the poverty line, of which perhaps the most obvious is health (and more specifically mortality). Health outcome indicators such as life expectancy and infant and child mortality are widely recognised, and estimates for most countries are readily available (though of variable reliability). They also reflect (albeit in the most extreme form) the impacts of a broad range of income-related deprivations – of adequate nutrition, access to health services, basic education, poor living environments, occupational risks, etc.

At the same time, it is universally accepted that there is a systematic relationship between incomes and health, and that low incomes are an important causal factor in this relationship.¹⁰² While there are various factors at play, as Angus Deaton argues:

*'Poor health in poor countries is not because of lack of medical or scientific knowledge about effective treatment, because the means of treatment are known, often long known. Low incomes are a more plausible explanation of poor health.'*¹⁰³

As Ravallion notes:

*'It is undeniable that there exist levels of consumption of various goods (food, clothing and shelter) below which survival beyond short periods is threatened, though it is less clear what these levels exactly are for any given individual.'*¹⁰⁴

This suggests the possibility, in principle, of establishing a cut-off point at a level of consumption which corresponds with a specified risk of mortality – but also the difficulty of defining such a point.

The identification problem is partly one of degree, and partly one of approach. In terms of degree, the question is what level of threat (i.e. what probability of death) over what period is required for a household to be considered poor? The relationship between income levels and mortality indicators, such as life expectancy and infant and child mortality, extends even to the upper part of the global income distribution – even in developed countries there are major differences in infant mortality according to socioeconomic status.^{105,106} The question is where one should draw the threshold of acceptability. Viewing poverty

from a moral standpoint, it seems reasonable to adopt a lower threshold than serious and immediate threat to life, for example through starvation; but to define as poor *anyone* who faces a higher mortality risk than others as a result of having a lower income risks making the concept meaningless, by including all but a few per cent of the population of the richest countries.

Thus, if one chooses an outcome- rather than input-based approach to the definition of poverty, health is the most obvious basis for it. Equally, if one were first to decide on a health-based definition, an outcome-based approach would have considerable advantages. An input-based approach requires identifying and pricing a set of commodities which is necessary to achieve a given probability of death in a particular setting, which is problematic for two reasons.

First, the inputs required for health are many and varied, requiring the detailed specification of a very extensive basket of goods and services. As discussed earlier in the context of the MIHL approach, this is problematic even in a developed country setting, and would be considerably more so in a developing country with much more limited data availability.

Second, health needs themselves vary considerably between different (national and sub-national) contexts, and between households (for example in terms of demographic composition, disability and chronic disease, etc), making the identification of a single basket of goods necessary to health impossible.

The alternative, therefore, is to shift to an outcomes-based approach – that is, to estimate the relationship between income (or consumption) and mortality (or health) indicators, and on this basis to assess at what point further reductions in income or consumption have effects on mortality which we consider unacceptable. This represents a shift from the consumption-based approach favoured by the World Bank to Sen's capabilities approach.

*'The capabilities a person has, are the substantive freedoms he or she enjoys to lead the kind of life he or she has reason to value. In this perspective, poverty must be seen as the deprivation of basic capabilities rather than merely as lowness of incomes, which is the standard criterion of identification of poverty.'*¹⁰⁷

A global outcome-based approach: Peter Edward's 'ethical poverty line'

Peter Edward's 'ethical poverty line' (EPL) is a unique attempt to estimate a global outcome-based poverty line focused on health on an explicitly moral basis.¹⁰⁸ Edward's starting point is the long-established relationship between national income per capita and life expectancy at birth, known as the Preston curve (after economist Samuel Preston who first presented it¹⁰⁹).

At low levels of national income per capita, life expectancy increases rapidly; but there appears to be a marked 'kink' beyond which it increases very little. Assuming that a similar pattern prevails at the individual level within countries, and using national income distribution data, Edward sets the poverty line at the estimated income level associated with this kink. Despite using deliberately conservative assumptions, so as to estimate the minimal possible level of the EPL, Edward's results indicate a poverty line between about \$2.90 and \$4.20 per day at purchasing power parity (at 1993 prices).¹¹⁰ World Bank estimates indicate that 50–60 per cent of the world's population (60–71 per cent of the population of the developing world) was poor by this definition in 2004.¹¹¹

While there are some methodological problems arising from Edward's assumptions,¹¹² the EPL approach nonetheless represents a considerable, and very important, step forward in the measurement of poverty conceptually, particularly in establishing a much needed moral dimension to its definition. From a moral perspective it is the best approach yet devised to setting a single 'moneymetric' global poverty line.

However, it remains subject to the problems inherent in the use of any single global poverty line. First, the global line needs to be translated into an equivalent line in each country; and this process (like the estimation of the line itself) relies

on the use of PPP exchange rates, raising the problems discussed earlier. Second, regardless of the conversion factors used, the same level of income inevitably translates into very different living standards in different contexts, so that the line will inevitably be too high in some countries and too low in others.

While the EPL represents the best approach yet devised to establishing a single morally-based global poverty line, set in monetary terms, it thus remains second-best to a country-specific outcome-based approach, standardising poverty lines according to living standards at a given income level rather than according to some definition of 'real' consumption. Such an approach is outlined in the remainder of this paper.

Towards an alternative approach – a rights-based poverty line

The problems discussed earlier suggest a need to get away, not only from the use of purchasing power parity, and of arbitrarily set poverty lines, but also from an approach specifying a single global level of income below which people are considered ‘poor’ and above which they are considered ‘non-poor’.

One option would be to abandon efforts to estimate global poverty at all. Srinivasan, for example, observes:

‘It seems that finding a poverty line that is representative and comparable across countries and regions is an impossible task. Global poverty counts have neither normative value nor empirical relevance for analyzing the determinants of poverty. It may be preferable to abandon the search for an international yardstick altogether, and stick to national poverty lines instead.’

However, such a counsel of despair would be dangerous: in the contemporary world, what is not measured soon ceases to matter to policy-makers; and to allow any less attention than is now devoted to eradicating poverty would be a moral abdication of the worst order. For all their (many and serious) failings, the World Bank’s estimates of \$1-a-day poverty and the Millennium Development Goal of halving it have undoubtedly increased the attention devoted to poverty by policy-makers, albeit to relatively limited effect as yet.

We therefore need to find a way of setting country-specific poverty lines, but to calculate them in a consistent way, such that the living standard at the poverty line is the same in all countries.

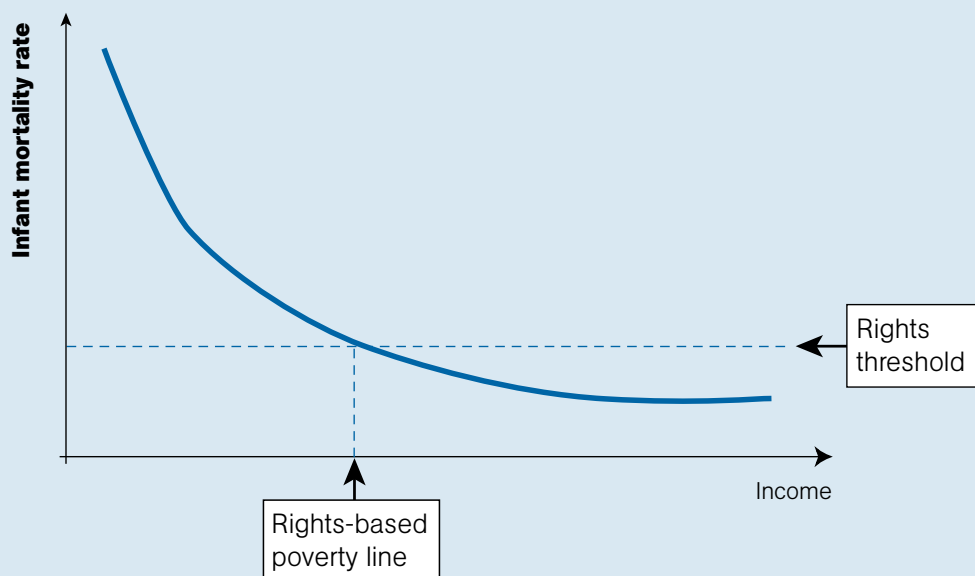
The general approach

We propose that country-specific poverty lines should be estimated based on the statistical relationship between income and indicators of living standards within each country. The poverty lines would thus be different in each country, but estimated in a consistent way, so as to reflect the level of income which *actually leads* to the same standard of living in each case – rather than an income level which could theoretically allow a given living standard if it were spent in exactly the right way.

This is closely related to the capabilities approach to poverty. In the absence of a clear consensus on which capabilities are of concern in the definition of poverty, however, and to provide a moral anchor for the minimum levels of capabilities, we move away from the language of capabilities to that of rights.

A number of economic and social rights are established in international instruments which have been signed and/or ratified by all or most countries; and many of these rights are closely linked to indicators which have a well-established relationship with income levels. These include, for example, infant and child mortality rates (right to child survival), life expectancy and disease prevalence (right to health), primary school enrolment and completion rates (right to education) and nutritional indicators (right to food). We interpret this as indicating that a consensus exists that each individual has a right to the attainment of a certain (as yet undefined) level of these capabilities, and therefore to an income consistent with their attainment.

Figure 3: Setting a rights-based poverty line.



While the rights-based approach is similar to capabilities-based approaches, however, there are three important differences.

1. The rights-based poverty line (RBPL) is based on *demonstrable* feasibility – the income level at which a particular capabilities are achieved in practice in a particular context – rather than *notional* capabilities based on (potentially unreliable) estimates of purchasing power, or on artificial assumptions about how people could theoretically spend their money (as in Kakwani and Son’s IFPL approach).
2. It takes account of *public provision and other non-market channels*, not by adding their value to income (as should in principle be done, but generally is not, in the application of standard-income lines), but rather by giving them a role in defining the poverty line. For example, free provision of high-quality education and health services will lower the level of income required to achieve given health and educational outcomes, and thereby lower the poverty line.
3. The RBPL takes account of differences in the level of income needed to achieve a given standard of living as a result of *inter-country variations in context*, such as geography, climate and epidemiology.

For each right identified as being linked to income, we propose that one or more indicators should be selected. A threshold level would then be set globally for each indicator, as an indication of what constitutes the fulfilment of the corresponding right. The corresponding poverty line in each country would then be defined as the income at which that level of the indicator is achieved (on average) in that country.

This is illustrated in Figure 3, for the case of the right to child survival. The curve represents the estimated statistical relationship between income and child mortality in a particular country and the horizontal line represents the level of child mortality judged to be consistent with the right to child survival. The income level indicated by the point at which these two lines intersect is then defined as the poverty line.

Clearly, deciding on the threshold level of each indicator would be a thorny issue. What level of child mortality is consistent with the right to child survival, for example? In an ideal world, clearly the answer would be zero – but this is not attainable even among the rich. Inevitably, where to set the level entails a large element of subjective judgment. This is, however, an unavoidable consequence of making our moral judgments explicit. We can only avoid it by continuing to avoid the question of what the right to child survival (or health or education) actually means –

and as long as it remains undefined, it will remain no more than a vague aspiration rather than a right in any meaningful sense.

The results of this approach are different from other approaches to defining and measuring poverty in three important ways. First, the poverty line in a particular country provides important information as well as the proportion of the population living below it. It provides a valuable indicator of the relationship between income and a particular aspect of economic and social rights. Thus two countries may have the same level of poverty, but one may have a lower poverty line than the other. This indicates that the country with the lower line performs relatively well in terms of fulfilling a particular right (e.g. to health) to its inhabitants for a given level of income (due either to social or geographical factors or to policy differences, for example in social provision); but that much of its population has very low incomes. In the country with the higher line, the translation of income into health is a greater problem than inadequacy of incomes as such.

Secondly, the relationship between income and the fulfilment of a particular right can be expected to change over time, so that the poverty line will also move. This means that the change in poverty over time is a result of a combination of two factors:

1. a change in *incomes*, represented by movement *along* the income/rights curve shown in Figure 3, from the section above the poverty line to the section below the line; and/or
2. a change in *living standards at a given level of income*, represented by an upward or (hopefully) downward movement of the income/rights curve itself, resulting in a lowering of the poverty line.

Again, this means that there are two key indicators rather than one: the change in the poverty line itself is important as well as the change in the incidence of poverty, in that it shows the relative importance of these two types of change.

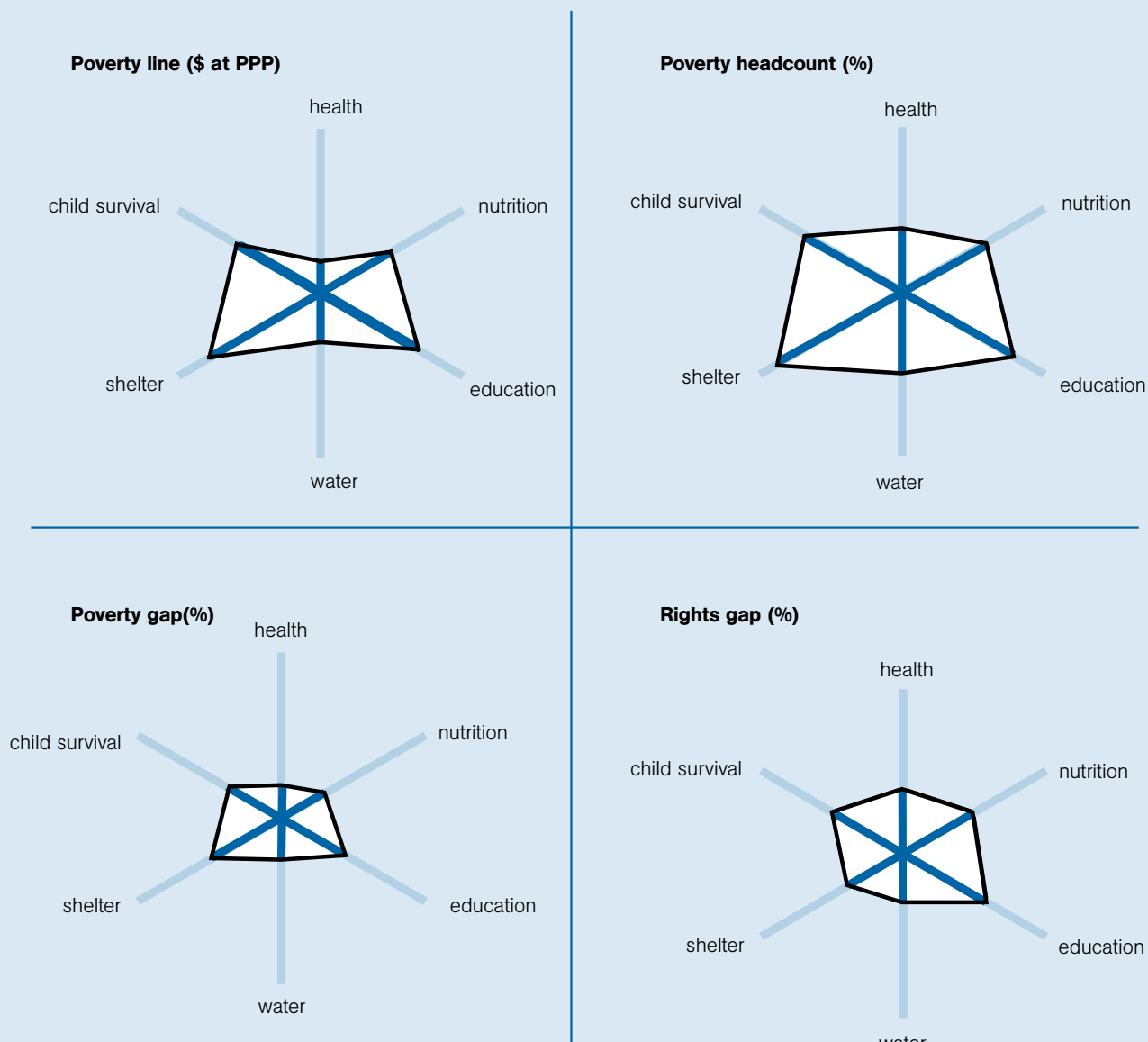
Thirdly, because there are a number of economic and social rights which are affected by income, this approach will produce a number of different poverty lines for each country. This means that the RBPL approach will provide a much richer analysis of poverty – but also that the picture it presents will be more complex, particularly given that there are two indicators for each right rather than one.

We therefore propose a graphical means of summarising the results, which we term 'poverty snowflakes' (since the objective of development is to melt them to nothing). This is illustrated in Figure 4. For each country, there is a separate snowflake for the poverty line, the proportion of the population living on incomes below the poverty line, the poverty gap (how far poor households' incomes fall below the poverty line), and the rights gap (the shortfall from the target level of each right as a result of poverty); and within each of these snowflakes, there is an arm corresponding to each right. For the poverty line, the scale would depend on the threshold level of the indicator used, and the poverty lines this generated; for the other "snowflakes", the maximum (i.e. the length of each blue line in Figure 4) would be 100 per cent.

The sizes of the snowflakes for each country thus provide a picture of five aspects of poverty in that country – smaller always being better:

- the overall severity of poverty (the size of the 'poverty gap' snowflake);
- the overall extent of poverty (the size of the 'poverty headcount' snowflake);
- the overall depth of poverty (the size of the 'poverty gap' snowflake relative to the 'poverty headcount' snowflake);
- living standards at a given level of income (the size of the 'poverty line' snowflake); and
- the overall extent to which rights are not fulfilled as a result of poverty (the size of the 'rights gap' snowflake).

Figure 4: RBPL ‘Snowflakes’



At the same time, the shape of each snowflake, in terms of the relative size of the different arms, provides a picture of the relative situation in each of these dimensions with respect to different rights.¹¹³

Benefits of the proposed approach

The rights-based poverty line concept has a number of compelling advantages over the \$1-a-day approach, and the other alternatives discussed in this paper.

- It retains the advantage of global poverty lines in providing a means of standardising poverty lines between countries, thus allowing comparisons and aggregation between countries, while also allowing poverty lines to be set according to living standards, which are why we are interested in poverty, and are of greater importance to poor households than having a specified level of income.
- By linking the level of the poverty line directly and explicitly to indicators of living standards, and more specifically to economic and social rights, it makes the

moral judgment embodied in the poverty line explicit, and helps to ensure that it is consistent with subjective judgments as to what constitutes the fulfilment of economic and social rights.

- By defining poverty explicitly in terms of non-income dimensions of poverty, it broadens the definition of income poverty beyond income alone, while still measuring it in financial terms, facilitating economic analysis and maintaining the link with economic policy and performance.
- Unlike the HPI, it both *combines* income and non-income dimensions of poverty, and allows the identification of individual poor households as well as generating population average figures.
- It ensures that changes in poverty, as measured, reflect changes in living standards, rather than changes in income which may or may not be associated with improvements in living standards, for example if they are achieved by increasing working hours (at the expense of education or health-promoting household activities), or shifting into unhealthy or dangerous occupations.
- It avoids the methodological problems associated with both purchasing power parity and market exchange rates, either in the conversion of a universal poverty line between countries (as in the '\$1-a-day' and Kakwani and Son approaches) or in the estimation of a global poverty line using cross-country data (as in Edward's EPL approach).

Finally, on a more general level, the RBPL approach has the potential both to integrate poverty analysis more effectively into the broader human development agenda, and to strengthen the focus on living standards and economic and social rights, not merely as *consequences* and/or *causes* of poverty, or as motivations, contributors and/or impediments to its reduction, but as *defining factors* of what it means to be poor.

Hitherto, the definition and measurement of poverty has been the province primarily of economists. This has both skewed our conception of poverty towards an economic one (based on equivalence of 'purchasing power' at some essentially arbitrary level) rather than a moral one (based on minimum acceptable living standards); and it has arguably been instrumental in relegating poverty from a primary humanitarian concern to an often secondary adjunct to other considerations such as economic stability and growth and the financial viability of business.

By shifting the focus of the definition and measurement of poverty to other disciplines such as health, nutrition and education, the RBPL approach has the potential to empower these disciplines in debates about poverty; to differentiate poverty, as something all people have a right to avoid, from secondary considerations such as economic stability, growth and business interests; and, by strengthening the moral basis of poverty eradication, to give it primacy over goals which are instrumental rather than intrinsically beneficial.

Some preliminary results: poverty and the right to child survival¹¹⁴

The limitations of the existing data mean that rights-based poverty lines can at present only be calculated indirectly and rather imperfectly. Nonetheless, we have undertaken a preliminary analysis to estimate rights-based poverty lines for the right to child survival (using infant mortality rates as an indicator) in selected developing countries. Since household-level data are not available for both incomes and infant mortality, our analysis is based on a simplifying assumption that each household's ranking in terms of income corresponds with its ranking in terms of asset scores (a composite indicator of each household's ownership of various assets).

The sample has been selected on the basis that they show a broadly monotonic relationship between income and infant mortality based on the approach we have applied (i.e. a reasonably consistent reduction in infant mortality as income rises), which is interpreted as indicating a relative absence of distortion, for example in the assumption of rank correlation between asset scores and household per capita incomes.

Since there are no data sources which provide data on child deaths and on income or expenditure for the same households, we have used Demographic and Health Surveys, which include data on child deaths by age and indicators of household wealth in the form of asset scores. We divide the population of each country into groups of 10 per cent (deciles) by asset scores, and estimate the infant mortality rate for each group. We then make the simplifying assumption that each household is in the same decile by asset scores as it is by income, so that we can use the average income for each decile from PovCalNet.¹¹⁵ In the case of India, separate results are shown for rural and urban areas, reflecting the form in which income data are provided on PovCalNet.

This provides us with a graph showing the pattern of incomes and infant mortality rates in each country, as shown by the blue diamonds in Figures 5–11. We then set various alternative threshold levels of infant mortality, ranging from 20 to 50 deaths per 1,000 live births, and estimate RBPLs on the basis of each. This is between about 3 times and 8 times the average levels typical of developed countries, and between 14 times and 33 times the lowest local rate in the UK.¹¹⁶

In most of these cases, it is possible to define a level of income such that all the deciles above this income have average infant mortality rates above the IMR threshold, and all those below have an average IMR below the threshold level. In these cases we estimate the RBPL (shown by a pale blue square) by effectively drawing a straight line on the graph between the points representing the deciles immediately above, and immediately below this point. We define the RBPL as the point where this line crosses the threshold level of the IMR.

In some cases, however, there is some ambiguity, in that the IMR falls below the threshold level, but then rises above it again before falling back. In these cases, we estimate the relationship between income and infant mortality between a point two deciles below the income at which IMR first falls below the threshold level to two deciles above where it last falls below the threshold (shown as a dashed line). Again, the RBPL is defined as the point where this line crosses the relevant IMR threshold.

The poverty lines at the different threshold levels of infant mortality are shown in the boxes in Figures 5–11. It will be noted that there are some thresholds for which no RBPLs are shown in particular countries (50 in Egypt and Nicaragua, 20 and 30 in rural India, and 20 in Senegal). This is because all income deciles in these countries have infant mortality rates below (or above) these levels. The method we apply, which is constrained to some extent by small sample sizes, cannot generate reliable estimates of RBPLs in these cases. We can therefore say only that the RBPL is above the average income of the richest decile or below that of the poorest decile as the case may be.

Figure 5: RBPL Estimates – Bolivia

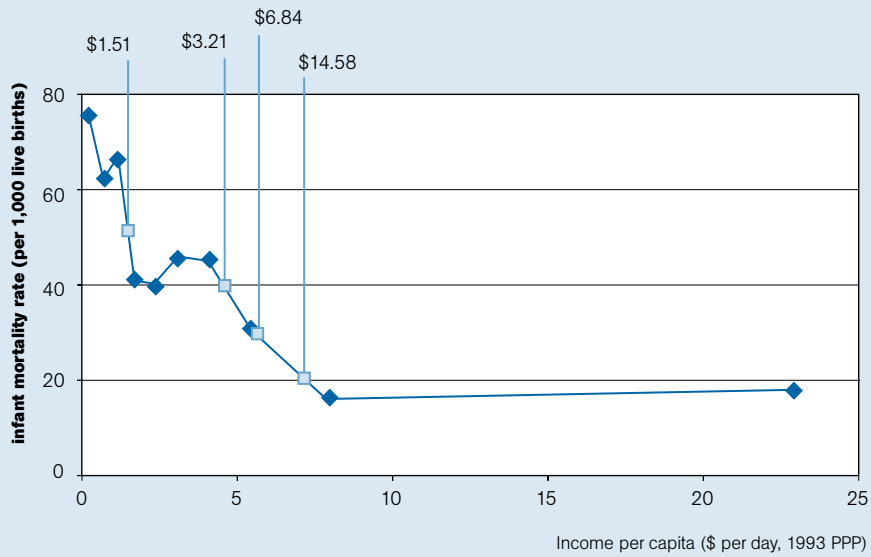


Figure 6: RBPL Estimates – Egypt

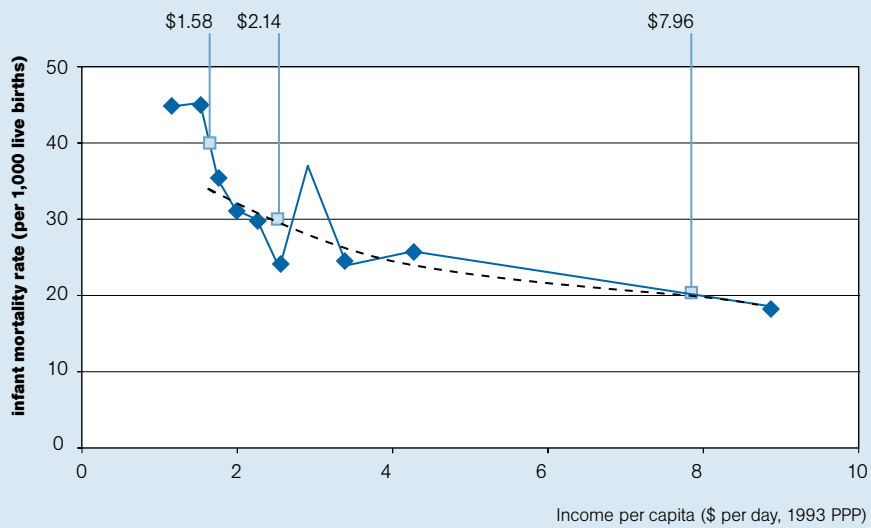


Figure 7: RBPL Estimates – India (rural)

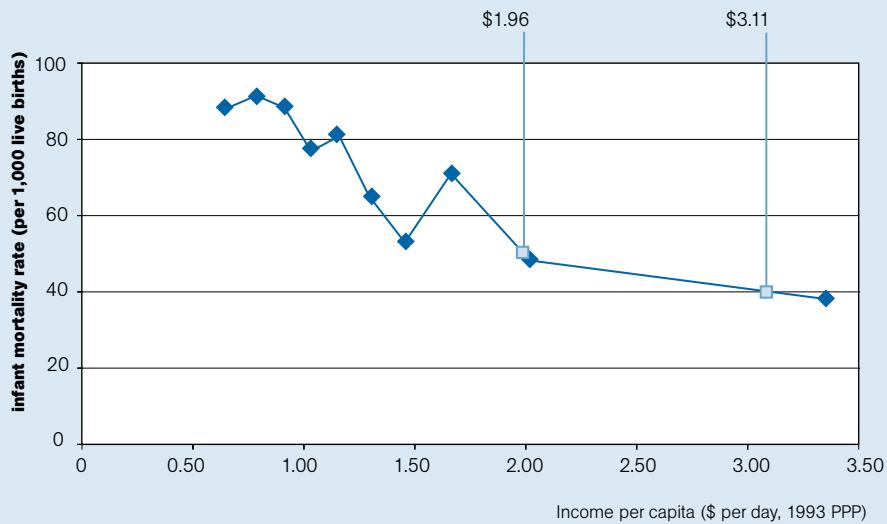


Figure 8: RBPL Estimates – India (urban)

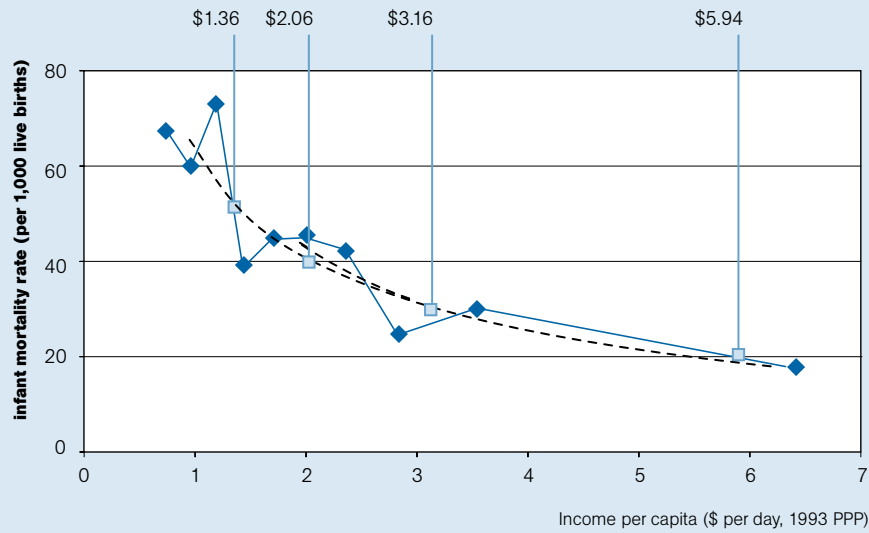


Figure 9: RBPL Estimates – Nicaragua

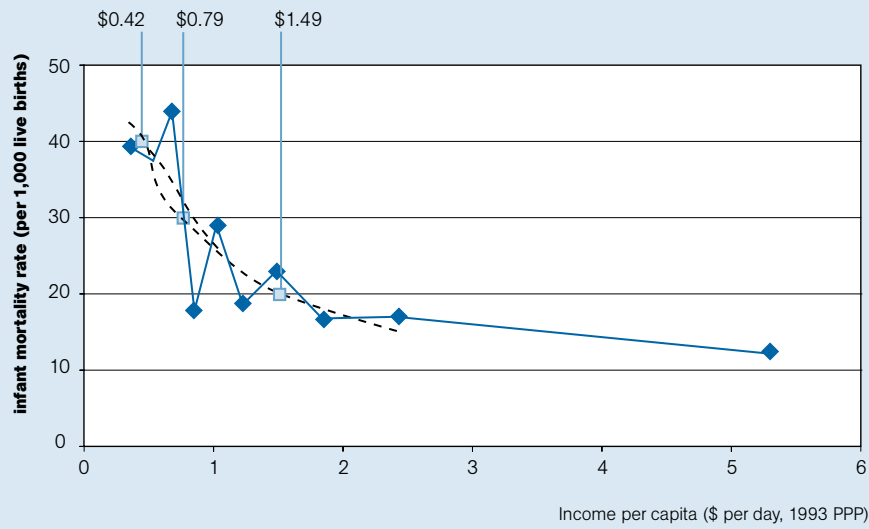


Figure 10: RBPL Estimates – Senegal

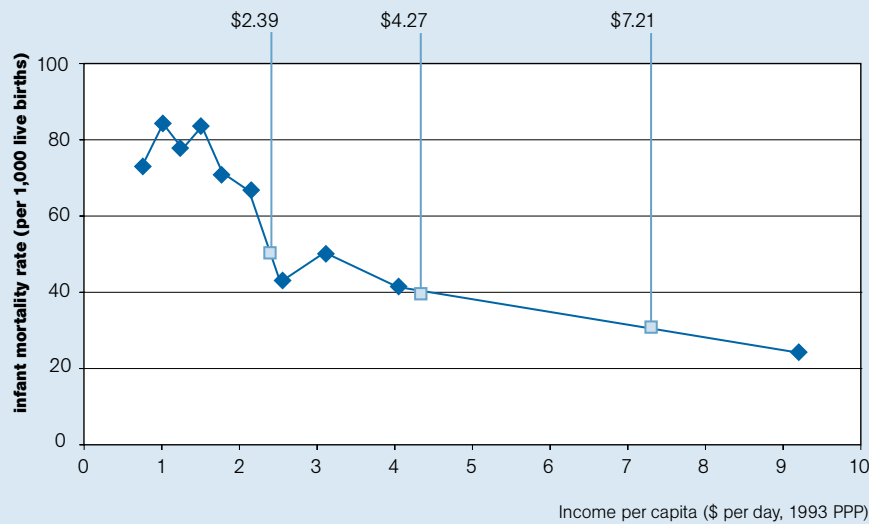


Figure 11: RBPL Estimates – South Africa

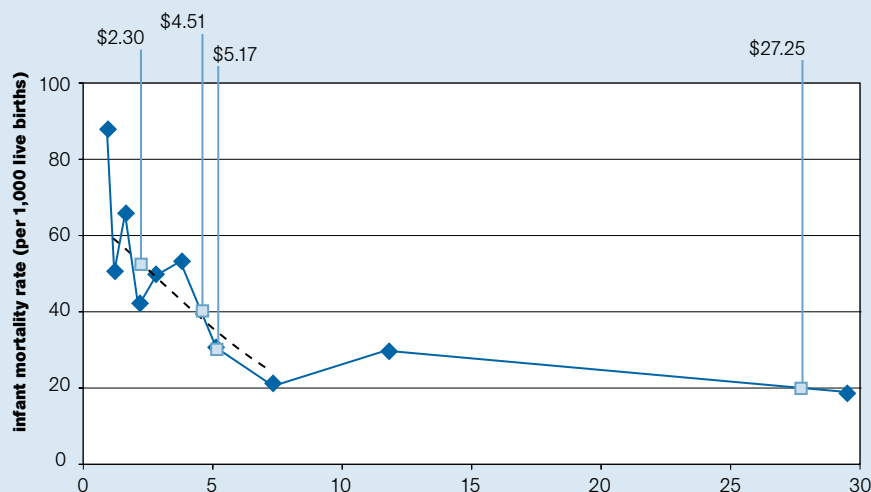


Table 2: Estimated RBPLs – Final Results (\$ per person per day at 1993 PPP)

	RBPL			
	IMR=50	IMR=40	IMR=30	IMR=20
Bolivia	1.51	3.21	6.84	14.58
Egypt	<1.12	1.58	2.14*	7.96
India (rural)	1.96	3.11	>3.32	>3.32
India (urban)	1.36	2.06*	3.16*	5.84
Nicaragua	<0.35	0.42*	0.77	1.49*
Senegal	2.39	4.27	7.21	>9.15
South Africa	2.30*	4.51	5.17	27.25

* Figures in italics are based on the estimated statistical relationship between income and infant mortality; others are based on the point at which the income-infant mortality curve crosses the threshold infant mortality rate.

The results of our analysis are summarised in Table 2. They indicate very wide differences in estimated RBPLs – between \$0.42 and \$4.51 per day at an IMR of 40/1000, the only threshold which falls within the range of decile income averages in all seven samples. Of course, the objective of the exercise is precisely to identify different poverty lines in different countries – and the wide range of living standards at an equivalent level of income (in PPP terms) which these results represent can be seen as reinforcing the case for a country-specific and outcome-based poverty line. However, the scale of the differences is perhaps surprising.

This variation may, in part, reflect problems in the estimated PPP exchange rates. It seems possible, for example, that this may explain the very low RBPLs estimated for Nicaragua (between a quarter and a third of the next lowest) – particularly in conjunction with the surprisingly low capability-based poverty line found by Reddy *et al.*¹¹⁷

Otherwise, as discussed earlier, the differences may be interpreted as reflecting inter-country variations in living standards (and more specifically, in the present

context, health outcomes) at a given level of income. Thus the high RBPLs in South Africa and Senegal (relative to the other countries in the sample) may in part be systematic differences between sub-Saharan and other developing countries¹¹⁸ – the relatively small differences between the results for these countries and Bolivia and rural India seem broadly commensurate with this interpretation, although the much wider gap between the African cases and Nicaragua seems more difficult to explain on this basis.

Equally, the higher lines in rural than in urban India are likely to reflect differences in access to health services, education, etc. in rural areas. It should be noted that this is a reversal of the result of a purchasing-power approach, which implies a higher line in urban areas as a result of generally higher prices.

One issue we have not addressed is the appropriate level of the IMR threshold. One might be tempted to interpret our results as providing a case for setting this at 40 per 1000 live births, as the one level at which there is a clear result in all our countries. However, we would argue that this is inappropriate, for three reasons.

1. Much of the rationale for the RBPL approach is that poverty lines should be based on moral considerations. To set the IMR threshold at a level which is analytically convenient in the light of our results would contradict this principle.
2. The absence of results for some thresholds in some countries is a result only of data inadequacies, which prevent estimation within the top or bottom 10 per cent of the population. Interpreting this as indicating a need to set the IMR threshold at 40 thus amounts only to saying that the threshold should lie between the lowest IMR for the lowest-income decile and the highest IMR for the highest-income decile in any country. There is no obvious rationale for this.
3. While a threshold of 40 maximises the number of definitive results within the current sample, this would not necessarily be the case for a larger sample or for developing countries as a whole. In the latter case, it seems inevitable that no threshold would allow the estimation of definitive poverty lines for all countries on the basis of existing data.

It will be easier to discuss this issue when more results are available. In principle, however, we would argue on moral grounds for a threshold no higher than 20/1000. While it is not realistic to require as a right that all households should have the lowest IMR currently obtainable by any income group in any country, it would seem difficult to argue that they do not have a right to an IMR no more than *three times* the *average* level in the developed world.

Conclusion

The development of the \$1-a-day poverty line, and of global estimates of the extent of poverty based on it, has undoubtedly been a major technical feat. It has also been of considerable importance in raising the profile of poverty as an issue on the international agenda. However, there can be little doubt that the estimates themselves are seriously flawed.

At best \$1-a-day figures give us a very approximate picture of what is happening, and one that substantially understates the extent of poverty (by setting a line that is too low) and overstates progress in reducing it. There is a real danger that it will give us a false sense of security, by encouraging policy-makers to think we know more than we do about the true picture of poverty, and give rise to complacency (by exaggerating the rate of progress in poverty reduction) and wrong policy decisions.

While there are a number of proposed alternatives which help to resolve some of the problems of the \$1-a-day approach, none offers a wholly satisfactory solution. The Minimum Income for Healthy Living is too demanding in terms of data and analytical requirements to be practicable in the context of developing countries; the International Food Poverty Line and the Global Capabilities-Based approach, though based on nutritional needs, generate poverty lines which are inconsistent with nutritional outcome indicators; and the Human Poverty Indicator does not allow the identification of poor households, and does not include an income component. While the Ethical Poverty Line is the most promising approach yet devised for producing a single global poverty line fixed in monetary terms, it remains subject to the problems inherent in such a line – the distortions arising from PPP exchange rates, and the inconsistency in the living standards associated with the same income level in different national contexts.

We therefore propose a rights-based approach, which combines the use of outcome indicators to provide a moral basis for the definition of poverty (as in the Ethical Poverty Line approach) with the principle of country-specific poverty lines estimated on a consistent basis (as in the Global Capabilities-Based approach). This allows the possibility of defining poverty lines according to what it means to be poor and why we are concerned about poverty – the effects of very low incomes on living standards – while maintaining the possibility of comparing and aggregating poverty across countries. Because this approach is multi-dimensional, it would also provide a much richer framework for assessing the nature and pattern of poverty and its effects, and trends over time.

There is much further work to be done in developing the approach, in refining the analytical methods we have developed, and in producing data on household incomes and living standards in a form which would allow more reliable results for a larger number of countries, based on a wider range of indicators. Nonetheless, the preliminary results presented in this paper, though inevitably approximate, both show that this approach is feasible and confirm its underlying rationale – that living standards at a given level of income vary too widely between countries for a single global poverty line fixed in monetary terms to be appropriate in different countries.

Developing a poverty line which provides a more accurate picture of the extent, depth, distribution and time trends of poverty in terms of actual living standards is important to our understanding of the world. It can also help to ensure that we do not draw the wrong policy lessons from a distorted picture resulting from misleading definitions and measures of poverty. Ultimately, however, improvements in our understanding and measurement of poverty will serve little purpose if they do not lead us to the next step – effective action, not merely for poverty *reduction*, but for a permanent *eradication* of the blight of poverty in a meaningful sense.

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