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Approaches towards Inequality and Inequity:

Concepts, measures and policies

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Approaches towards Inequality and Inequity: Concepts, measures and policies

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Abstract

Inequality, in various forms, is a major source of injustice, a cause of poverty, and sometimes of conflict. Children are often the victims. This paper analyses the different concepts of inequality, in particular differentiating individual, or vertical, and group, or horizontal, inequality, and adopting a plural approach to inequality, which involves moving beyond income to include some basic capabilities such as health, education and nutrition, and also inequalities in political power and cultural status. The paper discusses what a fair, or equitable, distribution is, drawing on some contributions of Western philosophers and economists. After reviewing different approaches, it argues that inequality among groups is particularly unjust. The paper argues for a plural perspective on the space in which inequality is assessed, following Sen's capability approach. Special attention needs to be given to those capabilities which affect people's basic life chances, including health, education and nutrition. It is argued that the assessment should relate to functionings (or outcomes) rather than capabilities (or possibilities), especially for children whose choices are severely constrained. The paper includes suggestions for identifying relevant categories for measurement of horizontal inequality (HI) in particular situations and makes some proposals for the type of measurement that is appropriate. It concludes with some suggestions for UNICEF activities and for research in this area. The approach suggested in the paper – with a focus on group inequalities and on plurality of assessments – is broadly consistent with UNICEF's existing approaches to these issues.

Keywords

Inequality, inequity, poverty, human rights, UNICEF, indicators.

Acknowledgements

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> Whichever way we look at it, we always return to the same conclusion: namely that the social pact establishes equality among the citizens in that they all pledge themselves under the same conditions and all enjoy the same rights.
>
> *Rousseau 1968 (first edition 1762): 76*

1. Introduction

This paper is concerned with the issue of equality and equity, with a particular focus on children and other vulnerable groups. It aims to review normative issues: should we aim for equality? What is a fair or equitable distribution? And also to consider more practical questions: how should we interpret any conclusions about equality and equity in practice? What does this mean for data collection and measurement? What are the policy implications in general, and in particular for UNICEF, especially in relation to children and vulnerable groups.

To discuss these issues, it is necessary to start with some conceptual clarifications concerning the two key concepts – equality and equity. This forms section I of the paper. Section 2 discusses the normative questions – what is a just and equitable distribution – drawing on the arguments of some philosophers and economists. The issue of distribution is not only a normative one, but also instrumental: how does inequality affect other valued objectives? A brief survey of this issue is covered in section 3. Section 4 discusses relevant measures of inequality, while section 5 considers which indicators are appropriate. Section 6 comments on UNICEF's role, and section 7 concludes with a summary of recommendations and some suggestions for future research.

2. Concepts and definitions

First, we need to clarify the distinction between 'equality' and 'equity'. 'Equality' implies treating people as equal in some respect (how this is to be interpreted is discussed later in this section). Once one has decided on the interpretation, whether equality has been achieved and – if not – the extent of inequality, is an empirical question. An 'equitable' distribution, in contrast, is one that is considered to be 'fair' - therefore an equitable distribution is the one we should aim for. Deciding what is an equitable distribution thus involves a value judgement, on which there can be disagreement. An equitable distribution need not be an equal distribution – fair shares are not necessarily equal shares. Because of this element of judgement in 'equity' it is a rather slippery term: what the World Bank, for example, means by equity could be very different from the perception of UNICEF. Indeed, section 2 of this paper reviews a range of judgements about the extent of equality that is desirable – or what an equitable distribution would be. Consequently, while this

paper aims to come to some conclusions about equity, to underpin UNICEF actions, most of the discussion is in terms of equality and inequality.

There are a variety of ways that 'equity' could be determined for operational purposes. In Section 2 I consider insights from some philosophers and economists on the issue of what is a just (or equitable) distribution. This is intended to provide some guidance. Views of what is equitable have evolved historically and are still evolving. Any institution aiming for an equitable distribution must come to its own judgement on these issues, drawing on general arguments such as those put forward in this paper, common perceptions and its own concerns (for example, UNICEF is clearly particularly concerned with treating children equitably).

When it comes to assessing the extent of inequality, and deciding on an equitable distribution, certain critical definitional issues need to be considered, including distribution among whom; if among groups, which groups; in what space the distribution is assessed; and over what time. These issues are considered below.

2.1   Among whom?

Distribution can be assessed among individuals or households within a society; among individuals or households in a region, continent, or the world; among nations; and among groups, within a particular society, or in the world as a whole. In this paper, I shall focus on particular societies, and thus not consider issues of global distribution or global justice. In the majority of analyses and measures of distribution, the focus is on individuals or households, often measuring this by the well known Gini coefficient. For example only individual/household distribution is reported on in the widely used World Development Indicators. I shall term this vertical inequality (VI) to differentiate it from inequality among groups, which I define as horizontal inequality (HI). Since children and women each constitute groups, and since the greatest deprivation is to be found among women and children in minority ethnic groups, HI is especially relevant to UNICEF. However, VI clearly matters too: in particular, for UNICEF, the major concern is with poor women and children. In the section on justice I shall consider both VI and HI, and argue that stronger conclusions can be drawn about an equity distribution for groups than for individuals. The measurement and data sections will focus on groups, since measures of VI are much better developed and known. In the analysis of causes and of policy too, I concentrate on groups.

2.2   Which groups?

Given the focus on HI, the immediate issue is which groups are of relevance. People can be grouped according to many characteristics, and most people are members of multiple groups, or have multiple identities. We are concerned here with groups that have salience to people and are relevant to policy-making. Age and gender groups fill both criteria and are especially relevant to UNICEF, as is disability. Ethnicity, race, region and religion are also important categories as they are often associated with discrimination and deprivation. While each of these groups can be described as 'socially constructed' and precise membership may be somewhat arbitrary and also fluid, in many societies they form salient political and policy-relevant groupings. The relevant grouping, however, differs according to the purpose of the classification and the history of any society. Only an in-depth historical and contemporary analysis can identify the appropriate classification for a given society. The broad categories given above – age, gender, disability, ethnicity, race, religion, region – provide good starting points everywhere. But some may prove irrelevant in particular places, and how each category is best defined (e.g. which age group; which ethnic or sub-ethnic classification) is likely to vary across countries and over time. However, in practice in particular societies, the categories associated with historical and/or contemporary discrimination, and exhibiting major HIs, are usually apparent even to a casual observer – for example, religion and caste in India, race in Malaysia; ethnicity in many African countries; different religious denominations in Northern Ireland and the Middle East. Some of the categories overlap (for example, religion and ethnicity quite often largely overlap). People are members of multiple groups, and particular combinations of identity can lead to the worst poverty: for example, in Peru indigenous, rural women suffer from treble discrimination – from being indigenous, being rural, and being women (Barrón Ayllón 2005).

2.3   Inequality of what, or in what space?

This is a question which has been subject to a great deal of debate and is critically important for questions of equity and policy (Williams 1962; Sen 1980; Dworkin 1981; Cohen 1989; Arneson 1997; Roemer 1998; Anderson 1999). The issue applies equally to both vertical and horizontal distribution.

Two important questions arise: first, whether the appropriate measure of inequality is in terms of incomes or resources or should extend to some broader measure of welfare; and, secondly, whether the measure should be one of outcomes or opportunities for outcomes, allowing for individual variations in the translation of opportunities (however assessed) to outcomes.

Economists have tended to define inequality in terms of money incomes, this being supposedly a measure of inequality in utility or economic welfare. However, some have rejected this measure of economic outcomes, and advocated a measure of inequality in economic opportunities (Roemer 1998; World Bank 2006; Paes de Barros, Ferreira et al. 2009). The latter may be defined narrowly as consisting of children and adults, of equal capacity and qualifications, having the same opportunities to succeed (get a school place; get a job; earn a particular income). But this is a very narrow interpretation, neglecting the many dimensions of people's circumstances that affect capacity and qualifications themselves as well as their opportunities and well-being. Equality of opportunities can be defined more radically as a situation in which 'morally irrelevant pre-determined circumstances, such as race, gender, place of birth, and family background' do not affect outcomes (Paes de Barros, Ferreira et al. 2009). The former definition can be consistent with considerable HIs, since deprived groups generally lack qualifications. But the latter rules out much HI, since most group inequalities do indeed reflect and are the consequence of such pre-determined circumstances.

Adopting an income or resources metric has been widely criticised as involving a narrow view of well-being and a number of alternatives have been suggested (Seers 1972; Morris 1977; Sen 1977; Hicks and Streeten 1979). Sen has advocated a much broader measure encompassing people's capabilities or freedoms, i.e. all the things that people can be or do. In focussing on a range of capabilities, Sen abandoned the money metric of incomes and moved to a plural assessment of well-being and inequality; and by focussing on capabilities, he also advocated opportunities rather than outcomes as the space for assessing inequality.

According to the capability approach, incomes remain important as they help determine what people can be or do; but there are many other factors besides incomes that are relevant to this, including the availability of public services, the extent and nature of civil society, a person's own characteristics, and so on. Thus incomes are not a good measure of the totality of capabilities. Within the capability set, people actually choose only a subset of things to do or be, which Sen defines as functionings. In some respects functionings are a more useful space for assessing inequality than capabilities – first, because they can be much more readily observed than capabilities; and secondly, for children especially, the freedom to make choices is heavily constrained so that functionings may indeed be a good indicator of capabilities. However, we should recognise that the distribution of functionings does not represent the full set of capabilities, and we could come to wrong conclusions about the distribution of capabilities on the basis of observed functionings.

For example, a person may appear very undernourished and poorly clothed and yet in reality be a rich miser, or an opulent ascetic.[1] This divergence between capabilities and functionings is less likely when it comes to group inequalities because it is less likely that there are systematic differences in the move from capabilities to functionings for a group as a whole, than for particular individuals.

There are a vast range of capabilities (and functionings). It is desirable to pick out a subset for assessment, first because some are quite trivial so that inequality in their distribution is also unimportant – for example, in the capability (or functioning) of juggling; and secondly, because there may be differences in the distribution of particular capabilities among individuals, reflecting differing personal characteristics; and when it comes to functioning there may be further differences in distribution among individuals across functionings reflecting choices (e.g. those who have chosen to become musicians may not have time also to be good at sports; those who have spent a lot of money on improving their house may not be able to spend so much on dressing well as someone else with the same capability set who has made different choices). The question then is how to pick out the critical capabilities to form the basis for assessments of distributional equity.

One way, advocated by Anderson (1999), is to include those capabilities which are necessary for people to be treated as of equal moral worth. According to her, this requires 'effective access to levels of functioning sufficient to stand as an equal in society' over a person's entire life (Anderson: 318). She argues that this does not necessarily involve complete equality but sufficient access to goods necessary for equality of respect which would vary across societies but would certainly involve minimum levels of some basic things, such as access to education and nutrition. While potentially, the idea of seeking equality of respect could form the basis of judgements, the selection of capabilities and the level of access required remains quite subjective. It could be interpreted rather minimally as equivalent to a basic needs approach – which would be consistent with considerable inequality in relation to non-basic needs, goods and services. Or it could be interpreted in a much more egalitarian way in capability or functioning space. Another approach is to select those capabilities which are of foundational importance, in the sense that they are necessary if other capabilities are to be realized. Health, nutrition and education, and access to other resources which may be essential for livelihood, such as transport, could come in this

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[1] There is a parallel here with the revealed preference approach to assessing welfare – see Little, I. M. D. (1957). *A critique of welfare economics,* Oxford, Clarendon Press. This approach assumes that choices a person makes (revealed preference) will maximise their welfare. Yet these choices are distorted by income distribution, advertising and social pressures, and an individual's inability to express a preference through their consumption decisions for socially provided goods. Hence the actual outcome is far from representing a welfare maximum and even further from maximising a broader concept of well-being.

category. Monetary incomes could also be included to encompass the many missing dimensions.

There are also important dimensions of life beyond the socio-economic, which are of especial relevance to HIs. In particular, inequalities in cultural recognition and respect are important for the well-being and dignity of cultural and religious minorities, as well as in determining the ability of people from such minorities to function effectively. For example, failure to recognise minority languages can handicap people in terms of jobs and incomes. Further political inequalities can be the source of many other inequalities. Lack of adequate representation in political bodies can lead to policy biases and discrimination as well as to lack of self-respect; while lack of citizenship often debars people from many other entitlements (Gibney 2008). Inequalities in cultural recognition, by definition, relate to groups since cultural practices (religion, cultural norms, language, etc.) pertain to groups, though of course they affect individuals within groups. Inequalities in political power can also be argued to be more relevant to groups rather than individuals, since individuals mainly exercise political power through group organization and representation. However, 'empowerment' is often attributed to individuals and since political power/influence varies sharply across groups and classes, in principle one could arrive at some assessment of its distribution among individuals.[2]

Adopting a plural approach to inequality, encompassing a number of important dimensions, raises the question of whether to develop an aggregate indicator, incorporating all dimensions. Any such aggregation requires some weighting among the indicators. Yet by their nature the plural dimensions are incommensurate, especially across broad dimensions, such as political, cultural and socio-economic categories. Weighting implies some trade-off among the dimensions – yet is it possible to weight an improved situation vis-à-vis health against a worsened situation politically? Any aggregation is therefore likely to be somewhat arbitrary and to conceal important information. However, aggregation within each of the broad categories may be helpful to get an overall picture of the situation.

In relation to the space or dimension of inequality, I conclude that:

(i)   incomes are an inadequate space for the assessment of inequality, whether VI or HI, which should incorporate socio-economic, political and cultural recognition dimensions;

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[2] Very little work has been done on assessing inequalities in political power – more on HIs than VI. See Stewart, F. (2011). "Inequality in Political Power: A Fundamental (and Overlooked) Dimension of Inequality." *European Journal of Development Research:* 23.

(ii)   the capabilities approach of Sen provides a good theoretical underpinning which, by focussing on capabilities or opportunities rather than outcomes, leaves room for individual agency; but for measurement purposes it is functionings rather than capabilities which should normally be assessed;

(iii)   that within the large range of potential functionings, a subset of foundational ones should be chosen, including access to health services and health outcomes; nutrition; educational access and outcomes; others may be selected according to importance and data availability in particular countries, but incomes (and income distribution) provide a useful supplement to represent many functionings which have not been included in the proposed list of critical functionings;

(iv)   for groups a special effort should be made to assess inequalities in political power and cultural recognition;

(v)   aggregation into a single indicator is not desirable across broad categories, but may be useful within categories.

UNICEF's focus on children and women suggests that there should be a selection of functionings (and underpinnings of these) especially relevant to women and children, including:

for women

a. health services relevant to the needs of women (maternity care)

b. women's educational levels and their access to adult education

c. relative male/female rates of abuse (assault; homicide)

d. an assessment of female political power, relative to men, at all levels (cabinet, parliament, local government, different levels of the civil service)

for children

a. health care for children, including immunisation, nutrition monitoring etc.

b. rates of child abuse

c. rates of homelessness among children.

For both women and children, hidden constraints on their freedom of choice make functionings a more appropriate space than capabilities. It must be emphasized that neither women nor children live as isolated individuals but are firmly embedded in households.

Consequently, the situation of the household is relevant to their position, so general inequalities facing households (including for example, male access to jobs) are relevant as well as the special ones observed for the group. In particular, the most deprived women and children are typically those in the worst off segments of the most disadvantaged racial/religious/ethnic or regional groups. This then requires identification of HIs among these identity groups; identification of the worst off households within the worst off identity group(s); and the intra-household distribution of functionings within the most deprived households.

2.4   Over what time?

Clearly if inequality fluctuates a lot, then one needs to measure it over several years to get a true picture of the distribution of capabilities. The nature and extent of injustice and the societal consequences of inequality are very different if particular individuals move in and out of poverty or riches than if everyone stays in the same place in the hierarchy. Yet data on societal inequality does not give any information on what happens to particular individuals – only on the distribution as a whole. Panel data would be necessary (and desirable) to inform us about whether a stable overall distribution is indicative of stability in the placement of particular individuals. The limited evidence available, which relates to movement in and out of poverty, indicates that many individuals do move in and out of poverty – for example, a study showed that in the Central and Western Regions of Uganda nearly a quarter of households moved out of income poverty over a 25-year period (Krishna 2005).[3]

However, for horizontal inequality we are not concerned with what happens to individuals but rather the group as a whole. Consequently, measurement of group performance over time will be sufficient to give an indication of longer-term inequalities. HIs between ethnic, racial and gender groups often (but not always) persist over decades and even centuries (Stewart and Langer 2008; Thorp and Paredes 2010). Tilly defined such 'durable' inequality as categorical inequality and provided an explanation of why such inequality tends to persist in terms of opportunities, exploitation, emulation and adaptation – i.e. a group which gets an initial advantage (opportunity) exploits and sustains this advantage in whatever way it can (e.g. by exclusion and discrimination) and this is widely imitated (Tilly 1998). An additional explanation is that an initial advantage becomes cumulative (e.g. extra income enables extra health and education in the next generation which then leads

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[3] In Europe it has been argued that extensive mobility moved 'virtually all families to relative deprivation at least occasionally' (Duncan, G. J. et al. (1993). "Poverty dynamics in eight countries." *Journal of Population Economics* 6(215-234): 215.

to extra incomes). While such cumulative factors apply to individuals, among groups the forces of persistence tend to be greater as they lead to asymmetries of social capital (groups having more contacts with other members of the same group than with outsiders) and this is compounded by overt discrimination (Stewart and Langer 2008). Panel studies have shown that individual mobility is greater for people in more advantaged groups than for those in disadvantaged groups (Devine, Plunkett et al. 1992; Duncan 1993; Corcoran 1995). For example, in Brazil, income persistence has been shown to be greater among Afro-descendants than the rest of the population (Ferreira and Veloso 2004) cited in (Paes de Barros, Ferreira et al. 2009). Consequently, the likelihood of moving in and out of poverty (and riches) is greater for members of an advantaged group, and members of the disadvanataged group are more likely to be stuck in their lowly position.[4] Consequently, horizontal inequalities are in some ways worse than vertical because the likelihood of persistent deprivation – for members of deprived groups – is greater. Generally, inequality needs to be measured over time to understand its full welfare implications.

2.5   Summary of conclusions on defining inequality

To summarise, inequality and distributional issues can relate to distribution among individuals, among groups within a country, or across nations. Here the discussion of inequality is confined to individuals and groups, the former being termed vertical inequality and the latter horizontal inequality. Considerations of the dimension or space in which to assess distribution and the durability of such inequality relates both to VI and HI. For both VI and HI, a broader approach is desirable than provided by the distribution of income. Sen's capability approach provides a good way of broadening distributional considerations. But we then need to identify a subset of particularly important capabilities to make any assessment manageable. Both poor people and poor groups suffer from 'durable' inequality as a result of cumulative forces that make it difficult to escape from poverty (and conversely make it easy for the best-off groups to maintain their privileges). But it seems likely that members of low-income identity groups that suffer from HIs find it more difficult to escape from poverty than poor members of richer groups. This has support from empirical evidence.

A major question that arises with respect to HIs is how the groups are defined. Some categories are relevant to all societies, including women and children, but others are relevant in some places but not in others – such as racial, ethnic or religious categories. In practice, almost everywhere the groupings that are important to people and

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[4] It is worth noting that Tilly's book about categorical inequality is actually entitled *Durable Inequality*.

constitute a source of discrimination and of political salience are clearly apparent. For example, race is the basis for clearly significant groupings in the United States and Brazil, indigeneity in Guatemala and Peru, religious differences in many Middle Eastern countries, and ethnicity and religion in many sub-Saharan African countries. Quite often multiple groupings are relevant in which case inequalities need to be assessed along these multiple demarcations – for example, religion, ethnicity and gender may all be highly pertinent groupings in some countries. Where no differentiating characteristics seem clearly relevant, the issue of HIs may not be important.

3. Issues of justice

This section considers what is, perhaps, the most critical question of all: the considerations relevant to determining what the right, just, or equitable distribution is. People have very different views on this, as is obvious from political debates worldwide. Indeed, some believe this normative issue is for each person and institution (such as UNICEF) to decide for themselves.[5] Yet it is helpful to consider the arguments of philosophers and economists, if only to provide intellectual justification for personal intuitions and biases. The issue is intertwined with the question of the space or dimension being considered. For example, everyone presumably would agree that we have equal rights to oxygen; and all democrats that all adults have rights to vote. Controversy arises much more over what constitutes a just distribution of material resources. This section considers the views of some philosophers and economists on this question – mainly in relation to resources, but also some other spaces. Most discussion has been concerned with vertical distribution. Here I aim to interpret the arguments than have been put forward in relation to VI, for HI. I conclude that one can come to stronger conclusions for HI than for VI, an important conclusion for UNICEF which deals primarily with HIs.

The discussion of these issues that I present here draws on the views of selected Western philosophers and economists, mostly firmly embedded in a liberal individualistic philosophic approach. It does not encompass non-Western ideas, nor communitarian views. It would be highly desirable to extend the discussion in this way, but this cannot be attempted here and the coverage is extensive enough.

We need to differentiate intrinsic reasons for supporting a particular distribution and instrumental ones. The former are concerned with the justice of a particular distribution as such, while the latter relate to the impact of a particular distribution on other objectives – for

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[5] Intuitionists argue that moral principles are based on individual intuitions of what is right, and consequently not subject to considered reasoning – Moore, G. E. (1903). *Principia Ethica*. Cambridge, Cambridge University Press.

example, on growth, poverty, social cohesion or the environment. Both types of reasoning are relevant to the normative question and both form elements of the arguments put forward by philosophers and (more so) economists. The instrumental reasons depend on posited empirical relationships between distribution and other objectives. Section 3 provides a brief survey of some of these relationships.

Four philosophical approaches to the question of justice and distribution are considered: first, those derived from a conception of shared humanity (Kant 1949; Williams 1962; Anderson 1999); secondly, analysis of the implications of a posited social contract (Rousseau, 1762; 1968; Rawls 1971); thirdly, what has come to be known as 'luck egalitarianism' (Dworkin 1981; Cohen 1989; Roemer 1996; Arneson 1997; Roemer 1998; Anderson 1999); and fourthly, the implications for distribution of giving primacy to libertarian principles (Locke 1773; Nozick 1974).[6]

The first approach derives from a conception of common humanity. Any human 'possesses a dignity (an absolute inner worth) by which he exacts respect from all other rational beings in the world, can measure himself with every other of this kind and value himself on a footing of equality' (Kant, *Metaphysik der Sitten*: 1786: 435). This clearly implies some type of egalitarianism, but the implications for the distribution of material resources are unclear. For Kant, every human should receive equality of 'respect': 'treat humanity… in every case as an end, never as a means'. The distribution of material resources has relevance to equality of respect; inequalities of wealth tend to be associated with inequality of respect, as wealthy people frequently treat others as of a lower order, and their wealth enables them to order around poorer members of society, including commanding their labour. Hence treating people as ends, never as means, does have egalitarian material content, although it clearly need not involve complete equality. How much inequality is consistent with equality of respect may vary across cultures. Light could be shed on this by empirical investigations into the determinants of respect for others. Group inequality – for example across race or gender – could be a particularly strong source of disrespect since there is an inclination to argue that 'you are poor because you are black/indigenous/female' with the implication that the poorer group has inferior capacities.

Williams also starts with a focus on people's common humanity. He argues that people are equal in their 'moral capacity'. But what does this imply for resource distribution? He argues that any difference in treatment of people must have justification and relevance: some goods are to meet needs, exemplified by illness (the need) and

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[6] Locke and Kant could also, of course, be placed in the contractarian category.

medical treatment (the good), and these should be distributed according to need; others are merited, exemplified by the capacity to benefit from university education (the merit) and university education (the good) and these, according to Williams, should be distributed according to equality of opportunity. The argument concerning 'needs' goods might be interpreted as supporting the universal provision of basic needs goods and services, as advocated in the basic needs approach to development (ILO 1976; Streeten, Burki et al. 1981; Stewart 1985), while the 'merit' part could be interpreted as broadly equivalent to Roemer's equality of opportunity (to be discussed below). However, the distinction between 'needs' goods and 'merit' goods is somewhat arbitrary and subjective. Anderson takes a similar position, as noted earlier. She interprets the material implications of treating people with dignity as involving comprehensive access to a minimum basket of basic goods and services. Yet, as noted, this could involve considerable inequalities – as we observe in many Western societies where there is broadly universal access to a minimum basket, but very substantial inequalities.

The fundamental principle behind human rights approaches to development is the view that every person is morally equal and consequently entitled to certain basic rights. 'All humans are born free and equal in dignity and rights' (1948 Universal Declaration of Human Rights). The human rights approach has also been interpreted as requiring equality in access to certain basic goods, broadly corresponding with the conclusions of Williams and Anderson. So long as these rights are realised, the human rights approach is consistent with inequality in access to non-basic goods and services. Comprehensive access to some basic minimum would have similar implications for individuals and groups. This approach is consistent with a 'basic needs' approach to development, or one that focuses on eliminating multidimensional poverty, but does not say much about distributional equity. The conclusion is that a society that fails to provide a basic minimum is certainly inequitable, but one needs to go beyond this to say what is equitable.

A second approach is to derive the principles of distribution from a social contract (Rousseau 1968 (first edition 1762); Rawls 1971). Rousseau argued that the social contract establishes 'equality among citizens' because 'they all pledge themselves under the same conditions and all enjoy the same rights', and his interpretation of this was that 'no citizen shall be rich enough to buy another and none so poor as to be forced to sell himself' (Rousseau 1968 (first edition 1762): 96). This is a potentially highly egalitarian conclusion if it is interpreted as ruling out wage labour. Rawls provides a more rigorous and detailed interpretation of distributional principles derived from a social contract, drawn up under a 'veil of ignorance'.

The first Rawlsian principle is that everyone should have basic liberties, such as political liberty, freedom of speech etc. The second – the difference or maximin principle – is 'that social and economic inequalities, for example inequalities of wealth and authority, are just only if they result in compensating benefits for everyone, and in particular for the least advantaged members of society' (Rawls 2002: 14-15).

Accordingly, equality of material resource distribution is just, unless it can be shown that the position of the poorest would be better in an unequal situation, which would only occur if inequality raised growth to such an extent that the poor received more than in an equal situation. Whether inequality does indeed improve the position of the poorest, and how much inequality is optimal, is an empirical question which may differ across contexts. For individuals, incentives may be needed to get them to work hard, use their talents to the full etc., so some vertical inequality may improve the position of the poorest through 'trickle down' processes or some redistribution. The same argument may apply within groups, justifying intra-group inequality. But there is no reason why this should require significant inter-group inequality – it would do so only if it were the case that there were systematic differences across groups in talents and propensity to work, and there seems no reason why this should be the case. Consequently, the maximin principle is likely to lead to less HI, if any, than VI. As far as children are concerned, there is no case here for inequality among children except in so far as they are part of households for whom some inequality may be justified under the maximin principle. This would suggest that, if possible, the well-being of children should be separated from that of adults in the household, by equalising their condition, through provision of services and transfers. Yet, it is difficult to separate access to resources of adults and children within the same household because of the fungibility of household resources. But a clever design of taxes, benefits and goods in kind could contribute towards this.

Thirdly, we consider 'luck egalitarianism', the fundamental premise of which is that people should not suffer advantage or disadvantage for elements outside their own control (Dworkin 1981; Ferreira and Gignoux; Roemer 1998)). In other words, inequality is justified if and only if it results from a person's own choices – e.g. with respect to work or lifestyle (or from luck). To the extent that a person's own choices are heavily influenced if not determined by background, luck egalitarianism would justify only limited vertical inequality. Since race, gender, place of birth and family background are all circumstances outside people's control, the principle would seem to eliminate most HIs except to the extent that there are freely chosen cultural differences leading some groups to behave differently and

thereby to gain more or less material advantage. Most of such cultural differences seem likely to be due to historical circumstances – not in the control of the individual. But some may be due to differences in preferences – for example, women might give priority to supporting the family rather than advancing in a career; some religious orders – for example, some orthodox Jews – give priority to praying and reading religious scripts over economic activities. In Israel this has resulted in significant HIs between orthodox Jews and the rest of the population. Those who advocate luck egalitarianism would argue that any material inequalities resulting from genuine differences in group preferences are justified, but others (e.g. Anderson) have argued against this and rejected the approach for this reason. When it comes to children, there seems to be no justification for any inequality on the basis of this approach, since their circumstances are almost entirely outside their own control.

Finally, the Locke/Nozick approach is concerned with just processes. This is potentially the most inegalitarian of the approaches considered since for them just outcomes are the outcomes that result from just processes which may be consistent with considerable inequality. For Locke, property is a natural right, so long as it is acquired by a person's own labour.[7] Nozick drops the direct link with a person's labour, and argues that just outcomes are those that result from legitimate acquisition and transfer of goods and services. Since he interprets legitimate transfer to include bequests, any inequality which may emerge – even from an equal starting point – can lead to considerable and rising, yet just, inequality. Instrumental consequences of such inequality are not considered relevant. However, there is one major exception to this unconstrained situation. This is the principle of rectification which 'comes into play' if resources are not obtained legitimately. As Nozick accepts: 'Some people steal from others, or defraud them, or enslave them' (Nozick :152). Where the resources were not acquired legitimately, including where inherited resources stem from illegitimate acquisition, 'rectification' (i.e. redistribution) is justified according to Nozick. How far this justifies redistribution depends on the interpretation of 'legitimate acquisition'. If one includes resources obtained by force, corrupt practices, and so on, the principle of rectification could apply extensively thereby substantially modifying the inegalitarian conclusions of this approach. This is particularly so for HI, since much group inequality

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[7] Locke, J. (1963). *Two Treatises of Government*. [S.l.], New American Library. Locke presents two qualifications which heavily restrict its inegalitarian implications: first, that a person should have only as much as can be used before it spoils (the egalitarian consequences of this is, of course, much weakened by the advent of the refrigerator and freezer); and secondly, one must leave "enough and as good for others". Interpreting Locke's principle becomes complicated if production involves machinery. Although it is normally regarded as justifying property ownership and inequality, Locke's views can also be interpreted as being redistributory, involving a labour-theory of value and ownership rights. Vaughan, K. (1978). "John Locke and the Labor Theory of Value." *Journal of Libertarian Studies* 2 (4): 311-326.

stems from unjust treatment at some prior (and often current) time: indigenous peoples generally had their lands taken from them; Afro-Americans in the United States were slaves; poorer groups in many African countries were discriminated against by the colonial authorities and then again by the independent governments; women as a group have been oppressed for millennia, often treated as near-slaves, forbidden propert rights etc. These injustices may no long exist (or exist only partially), but Nozick's principle of rectification still applies because many of those who are now privileged inherited some or all of their privilege from people in previous generations who did not acquire their initial resources legitimately. There is a general presumption, indeed, that this is the case with all inequalities between sizeable groups because why otherwise would they be unequal?

In sum, with the exception of Nozick, the philosophers reviewed here provide justification for only limited vertical inequality. The human rights/common humanity approach would justify equality in access to some basic entitlements, but has little to say beyond that, while Rawls' difference principle justifies inequality only if it advantages the poorest. Luck egalitarianism accepts inequality only if it originates in circumstances within the individual's control. For each approach, it is more difficult than for vertical inequality to find justification for any significant horizontal inequality. Equality of respect would seem to limit HI since inequality between groups is often a source of disrespect to members of the disadvantaged group. Rawls' maximin principle is unlikely to justify significant group inequality because it is unlikely that output would be significantly greater in the presence of group inequality – given broad equality in the distribution of talent and character across groups. Moreover, it is unlikely that the poor group would benefit much from output gains resulting from inequality, since the poorer group(s) often experience discrimination and interlocking disadvantages which limits 'trickle down' so that output gains resulting from HIs may not benefit the poorest as required by maximin. Luck egalitarianism rules out most HI since inequality is not justified if it involves circumstances beyond the individual's control. And Nozick's principle of rectification is likely to apply to much group inequality, since so much of it has its origin in illegitimate processes. When it comes to children in particular, strongly egalitarian conclusions emerge since children are not affected by the incentives that may be needed for maximin, and their situation is mostly outside their own control. But children are embedded in households, so that to the extent that some adult inequality is justified, this affects children too. The challenge then is to devise ways of achieving child equality without adversely affecting any unequalizing incentives that are needed to achieve the optimum adult distribution.

Economists' views of distribution today are generally much more instrumental than those of philosophers, investigating which distribution best maximises chosen objectives, primarily economic growth. But this was not always so. Utilitarianism which forms the basis of much of economics implies that the extent of inequality should depend on which distribution maximises utility. Pigou argued that this led to a highly egalitarian conclusion since he assumed that a person's marginal utility would diminish as they acquired more of it (Pigou 1920). However, this assumption was famously disputed by Robbins who asserted that one cannot compare the utility gained by different individuals on the basis that: 'in our hearts we do not regard different men's satisfactions from similar means as equally valuable' (Robbins 1945: 156-7; Robbins 1938). Robbins' argument was widely accepted and economists since then have mainly shied away from making judgements about the desirable degree of inequality except from an instrumental perspective. This view was reinforced by those economists, such as Hayek, with libertarian views about the undesirability of restraints on individual actions.

Nonetheless, economists accept that there are instrumental considerations influencing the desirable distribution, with the optimal distribution being that which would maximise efficiency and output. A certain amount of vertical inequality may be needed, for example, to encourage people to work hard, use their talents and direct their energies in a way that exploits their comparative advantage and maximises societal output. In addition, it is sometimes argued that unequal income distribution increases savings. On the other hand, there is also an efficiency case against too much inequality – since it can reduce societal human capital, as poorer people are likely be more undernourished and undereducated, while highly unequal income distribution may reduce the size of domestic markets (leading to under-consumption and unemployment, though there are ways, of course, of compensating for this). Thus there are efficiency arguments both for and against vertical inequality.

One plausible conclusion from economists' instrumentalism is that the objective should not be equality of outcomes but equality of opportunities since in principle one would expect efficiency to be maximised if everyone faces the same opportunities. Yet, as pointed out above, equality of opportunities can be interpreted in different ways. On the one hand, it may be the same as luck egalitarianism, i.e. ruling out inequalities which arise from circumstances beyond the control of the individual. As noted above, this leads to a pretty egalitarian conclusion and would require considerable intervention in market outcomes, given the long-term historic disadvantages suffered by many groups (ethnic, female, racial, for example). Yet

this might well not be the output maximizing position in the short to medium term. On the other hand, a more limited interpretation of equal opportunities is that no one suffers discrimination: for given qualifications and capacities each faces the same opportunity. This is more likely to be the short-run output maximising position, but it would leave considerable inequalities, since people have historic disadvantages that prevent them from having equal qualifications and capacities.

Like those of philosophers, the views of the economists lead to more egalitarian conclusions in relation to groups than individuals. First, while Robbins' statement about how different people may get different satisfaction from the same income might be justified in relation to individuals, it is very difficult to argue that a particular gender or racial or ethnic group as a whole gets more (or less) satisfaction from a given amount of income than another. Secondly, the efficiency arguments suggest elimination of discrimination, which should eventually mean equality between groups, especially if interpreted in the broad sense to eliminate historic sources of disadvantage.[8]

As far as children are concerned, a more egalitarian position again emerges. The incentive/savings arguments for inequality do not apply to children. Moreover, efficiency arguments would suggest that all children should have access to sufficient food and access to health services to enable them to grow up as healthy adults, while their education forms the basis of future productivity. Evidence for the instrumental importance of these items is summarised in the next section. If a society has to ration some of these basic elements – for example, can only afford university education for some – efficiency considerations suggest such rationing should be done on the basis of merit and not of wealth.

In summary, some vertical inequality may be justified from a maximin or output maximising perspective, but it is more difficult to justify horizontal inequality on these grounds. Moreover, for children, the considerations that may justify some inequality do not apply. In fact, efficiency requires that children have equal access to (or opportunity to access) basic services. As noted earlier, the challenge is to improve distribution among children while retaining incentives for efficiency among adults. Yet, starting from where we do, this is not a particularly significant challenge, because in most countries current levels of inequality among adults generally seem

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[8] It is worth drawing attention to an interesting similarity and contrast between the efficiency arguments of economists and those of philosophers (notably Rawls). Rawls starts with the presumption that equality is desirable but that inequality may be justified if it serves, instrumentally via efficiency effects, to improve the position of the *poorest* compared with an egalitarian situation. Economists, in contrast, argue that greater *equality* may be justified (compared with a market outcome) if it serves to improve the position of at least one person and not to worsen that of any other – or (allowing for compensation) if it raises national income – without regard to the consequences for the poorest.

likely to exceed the maximin or efficiency maximising levels.[9] While it would be extremely difficult to say precisely what a just distribution would look like, pragmatically this may not be needed since it seems highly likely that, whatever its precise contours, it would be far more equal than the current situation. In other words, we know the direction of change needed even if we may not agree on the exact nature of Utopia.[10]

4. Instrumental reasons for concern with income inequality

The need for a substantial reduction in inequality in order to achieve an equitable distribution, based on principles of justice, is sufficient to justify redistribution without turning to instrumental reasons. However, the impact of distribution on other objectives is relevant to policy if redistribution involved large costs in terms of the achievements of other important objectives. Moreover, instrumental reasons for more equality may be helpful in convincing people who put weight on other objectives and/or disagree with the conclusion derived from principles of justice. This section, therefore, briefly summarises some of the findings of associations (if not causality) between income distribution and a range of other significant societal objectives.

These instrumental reasons relate to societal effects which may in turn affect output. For example, high vertical inequality tends to increase criminality which is not only undesirable in itself, but may also lead to a reduction in investment and output. Moreover, inequality may be undesirable because it impedes the widely accepted objective of reducing poverty. The implications of these instrumental reasons for redistribution depend on empirical relationships. For example: does inequality increase or reduce growth? Does it increase criminality? Does increased crime reduce growth? Is reducing inequality the most effective way of reducing poverty? (see e.g. Krahn, Hartnagel et al. 1986; Alesina and Rodrik 1994; Persson, Tabellini et al. 1994; Brush 2007; Bourguignon 2003; Eicher and Turnovsky 2003).

4.1   Growth of incomes

As noted above, there are reasons to expect both a positive and a negative impact of inequality on growth. In the 1950s it was assumed that more unequal income distribution would lead to higher growth, via higher savings and incentive effects (e.g. Galenson and Leibenstein 1955; Okun 1975). Consequently, it was

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[9] Evidence on the relationship between growth and inequality is summarised in Section 3.
[10] This approach follows that advocated by Sen, A. (2009). *The Idea of Justice*. London, Allen Lane. in which he argues that one can make a judgement about more or less just situations without needing to (or being able to) define a completely just situation.

argued that countries should grow first and redistribute later. This was challenged, for example, by Adelman and Morris (1973), who argued that more equal initial income distribution would lead to higher growth. Much of the empirical literature has supported Adelman and Morris, (e.g., Alesina and Perotti 1994; Alesina and Rodrik 1994; Persson, Tabellini et al. 1994; Bénabou 1996).[11] However, Fishlow (1995) finds no statistically significant evidence of a relationship between growth and equality, when a dummy variable is introduced for Latin America and Barro (2008) found that inequality was bad for growth in poor countries, but good for growth in rich (i.e. developed) ones. These investigations all use OLS cross-country estimates. Using fixed effects, to allow for country specific influences, Li and Zou (1998) and Forbes (2000) find a very different relationship, with an increase in inequality being associated with an increase in growth for countries over time, while Banerjee and Duflo (2003), using non-parametric methods, find that a change in inequality in either direction is associated with a reduction in growth. Yet, investigations over time in states in the United States showed a positive relationship between greater equality and higher growth, from 1920-1980, allowing for fixed effects (e.g. (Panizza 1999). Recently, two IMF economists found that 'when growth is looked at over the long term, the trade-off between efficiency and equality may not exist. In fact equality appears to be important in promoting and sustaining growth' (Berg and Ostry 2011: 13). The relationship between inequality and growth may vary according to the level of inequality. Cornia (2004) plotted inequality against growth of GDP per capita for 1960-1998, showing a concave relationship with growth rising as inequality increases from very low levels, and then declining with a further increase in inequality.

Putting these findings together we can conclude that there is not likely to be a cost in terms of reduced growth arising from greater equality, and indeed growth may rise as inequality falls.

4.2   Inequality and poverty

It is obvious that, for any given level of average per capita income, the higher inequality, the higher the poverty rate. If inequality rises, so does poverty. Another way of looking at this is in terms of the elasticity of poverty with respect to growth (Bourgignon 2003; Adams 2004; Fosu 2009). If growth is accompanied by rising inequality, then the change in poverty may be very low or even negative while, conversely, slow growth can lead to large reductions

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[11] See also Birdsall, Ross and Sabot (1995); Bourguignon, F. (1995). Comment on 'Inequality, Poverty and Growth: Where do We Stand? Annual World Bank Conference on Development Economics. Washington DC, World Bank. Bourguignon (1995); Deininger, K. and L. Squire (1998). "New ways of looking at old issues: Inequality and growth." *Journal of Development Economics* 57(2): 259-287.

in poverty if accompanied by large improvements in income distribution (Cornia 2004). Datt and Ravallion illustrated this in a comparison of Brazil and India in the 1980s: in India, a significant fall in rural poverty occurred despite very poor growth (due to monsoon failure) as distribution was relatively equal and improved; conversely, in Brazil where growth was high, high and worsening inequality meant that poverty hardly changed (Datt and Ravallion 1992). The importance of the level (and change) in income distribution for mediating the impact of growth on poverty has also been illustrated by Dhatt and Ravallion (1998) for Indian states, by Fosu (2009) for African economies and by Kalwij and Verschoor (2007) for 58 developing countries in the 1980s.

4.3   Inequality, education, health and nutrition

Health, education and nutrition are central capabilities, so distribution in these dimensions is an important determinant of equity. Moreover, one reason why greater income inequality may reduce growth is because it worsens the human capital of the population. Research in this area has focussed on vertical inequality (VI). Considerable evidence shows that higher income inequality leads to worse outcomes in education (Meyer 2001), health and nutrition (Hildebrand and Van Kerm 2009, Kondo et al. 2009), and that this in turn is likely to reduce growth (Birdsall and Sabot, 1994; Ranis et al., 2000). Some evidence on the links between income inequality and social indicators is briefly summarised below.

There are links between incomes, nutrition, education and health, with poor outcomes in one making poor outcomes in the others more likely. Taken together this leads to a vicious cycle among poor people and poor groups, with poverty breeding deprivation in health and education which in turn keeps households or groups in poverty. These interactions are particularly powerful for identity groups, where discrimination can prevent upward mobility (Carter and Barrett 2006; Durlauf 2006; Stewart 2009). The mechanisms through which income inequality is translated into inequality in human dimensions include lack of resources at the level of the household, inadequate social expenditure and maldistribution of public resources due to the political pressures associated with unequal societies. Children are particularly adversely affected, subject to malnutrition, ill health and poor education which affects their lifelong prospects. Breaking into this vicious cycle ideally involves action on each element, in each case with a prime focus on children because transformation in their lives will eventually permeate the whole of society.

THE VIRTUOUS CYCLE AMONG THE RICH

THE VICIOUS CYLE AMONG THE POOR
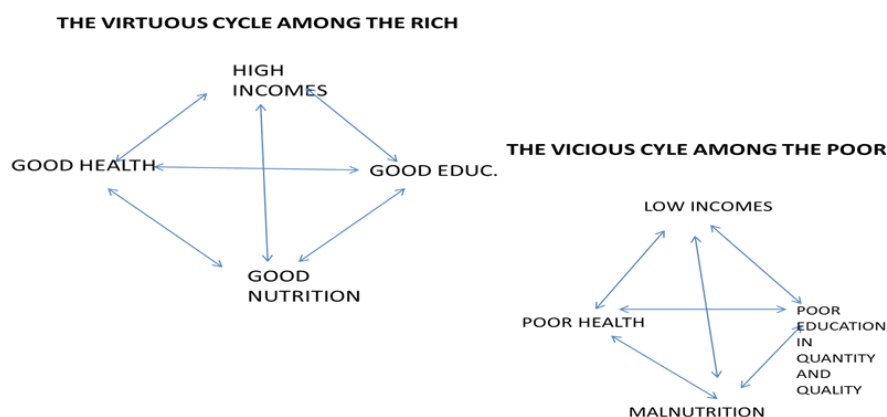
4.4　Some evidence of the links

Inequality in incomes tends to be reflected in inequality in education, with lesser overall educational achievements at basic levels (such as literacy, completion of primary and secondary school), and unequal access to tertiary education (Filmer and Pritchett 1999; Bachmann and Hannum 2001; Birdsall and Sabot, 1994). This arises through effects on both household decisions and public spending (Gutiérrez and Tanaka 2009). Figueroa (2006) has explored inequalities across groups in Peru, showing systematic differences not only in access to education but also returns, partly due to discrimination for educational access and quality, (Murcott 2002) and employment.

The relationship between average health outcomes and income inequality seems to be complex, and not clearly established (Subramanian and Kawachi 2004). Wilkinson and Pickett (2006) reviewed 168 analyses – of these, 52 per cent found evidence of a link between higher inequality and worse average health outcomes, 26 per cent were partially supportive and 22 per cent provided no support. In more egalitarian contexts, there is less evidence of a link between income inequality and ill health, suggesting possible threshold effects (Subramanian and Kawachi 2004). Deaton (2003) has questioned the data and methodology of some of this work, and does not find a relationship between vertical inequality and health. The scatter diagrams below indicate the weakness of the relationship between income inequality and average health as measured by the infant mortality rate across countries. Taking developing countries alone, no relationship emerges.[12]

Among the studies which have explored the impact of inequality on average health outcomes, none find a positive relationship in which

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[12] Multiple regression for 115 countries (including developed) shows a relationship between IMR and income per capita, but no relationship with inequality:
$$IMR = 40.69 - 0.00132y\,(-6.969) + 0.118g\,(0.474),\,(adjusted\ r-square = 0.313)\ where\ y = income\ per\ head\,(PPP), g = Gini\ coefficient\ and\ bracketed\ figures\ are\ T-values.$$

more inequality improves health. Hence decreasing inequality will not worsen, and may better, average health. Moreover, given that most studies find a relationship between individual income levels and individual health outcomes, reducing inequality would contribute to improving the health of the poor.

There have been no studies that I know of exploring the relationship between HI and health outcomes, but a general finding that social status is a determinant of health outcomes would suggest that the health of deprived groups might suffer from large HIs. Inequality also has a deleterious effect on nutrition of low income groups, due to a combination of lack of income and poor maternal education (Murcott 2002; Moradi 2006). This in turn adversely affects health.
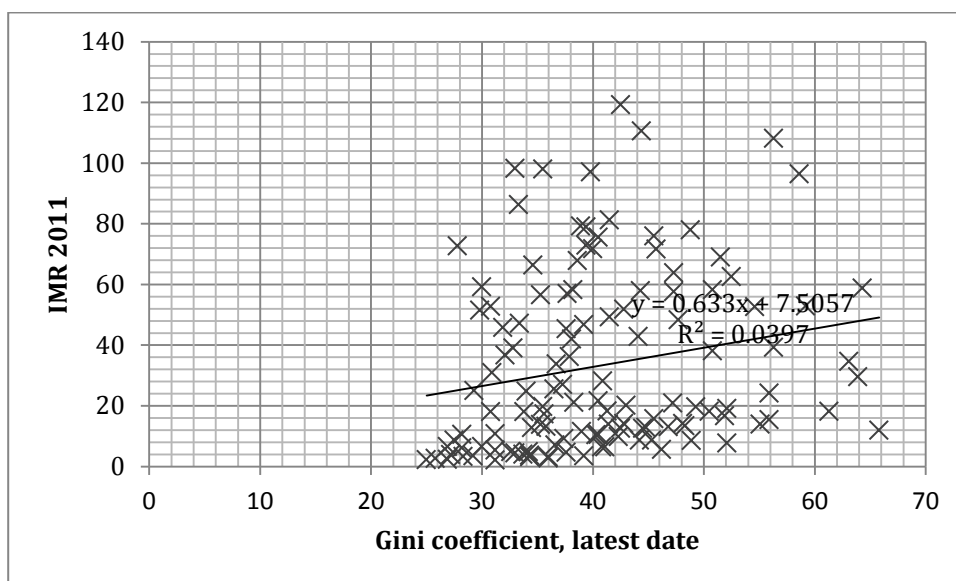

Figure 1   Infant Mortality Rate (IMR) and Gini, all countries
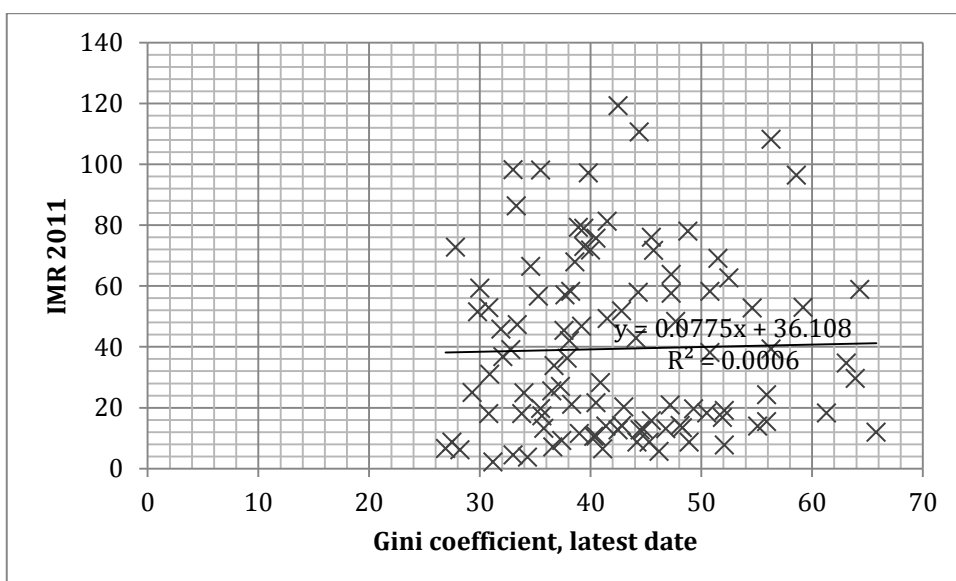

Figure 2   Infant Mortality Rate (IMR) and Gini, developing countries

4.5   Inequality and crime

Research consistently shows that greater vertical inequality is associated with higher levels of criminality as measured by intentional homicides and robbery. As Fajnzylber, Lederman et al. (2002: 1) state after investigating the determinants of crime both across and within countries: 'Crime rates and inequality are positively correlated within countries and, particularly, between countries, and this correlation reflects causation from inequality to crime rates, even after controlling for other crime determinants.' (See also Krahn, Hartnagel et al. 1986; Fajnzylber, Lederman et al. 2002) and many references cited in these articles). However, interpretation of why there is this link between inequality and crime varies: economists suggest it is due to '"economics of crime" with more poor people having incentives to rob the rich in unequal societies; sociologists see "sociology of crime" with collective action ability for social control being undermined in unequal societies; public health persons see more crime producing "psycho social stress" in unequal societies...etc'.[13] Which of these mechanisms is dominant will determine appropriate policy responses. However, whichever it is, a reduction in inequality should reduce the crime propensity. There have not been studies of the relationship between HI and criminality.

4.6   Inequality and conflict

There is strong and accumulating evidence that horizontal inequalities are associated with greater likelihood of the outbreak of civil war (Gurr 1970, Stewart 2000, Mancini 2008). On balance the evidence does not support a connection between VI and civil war (Fearon and Laitin 2003; Collier and Hoeffler 2004), although Auvinen and Nafziger (1999) found a weak connection. This is because people mobilize behind a common identity (often ethnicity or religion) and such mobilization can be stimulated by sharp HIs. There is less potential for mobilization with high VI, but there are peasants and caste movements which unify and mobilize the deprived.

Research indicates that HIs are particularly likely to provoke conflict where there are both economic and political inequalities simultaneously in the same direction (Stewart 2008, Cederman et al. 2011, Ostby 2008), since in those circumstances leaders have an incentive to mobilize because of political exclusion, while socio-economic inequalities provide an incentive for people to mobilize. Inequalities in cultural recognition can also provoke conflict (Langer and Brown 2008). There is also evidence that horizontal inequalities

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[13] Personal communication from Goran Holmqvist.

are associated with other forms of group violence, including milder types such as riots (Blau and Blau 1982) and horrendous forms like genocide (Fein 1993, Harff 2003, Stewart 2011). Some work too links gender inequality to domestic violence (Bailey and Peterson 1995, Yodanis 2004). The relationship between HIs and conflict provides a strong motive for action to correct such inequalities, even among people who are not concerned with equity. A concern with children makes this even more urgent, as children are often the victims of conflict, both directly and indirectly. Yet action has to be introduced cautiously because the correction itself can be provocative.

Women and children are in the frontline of many of these consequences of inequality: children are the ones whose futures are blighted by ill health, malnutrition and poor education – indeed this is where they come face to face with inequality. If violent conflict breaks out, women and children are often victims, subject to deprivation, abuse, flight and sometimes death. Women are especially subject to domestic abuse in violent societies.

Section 2 focused on what some philosophers and economists imply about the nature of a just distribution. An instrumental element was intertwined with some of their arguments (including for Rawls' maximin and some economists). The force of instrumental arguments depends on empirical relationships. This section has reviewed some of these empirical relationships. For economic growth, much of the evidence (but not all) suggests more equality is associated with higher growth, although it has been suggested that where vertical inequality is very low an increase in inequality might speed up growth and conversely, where it is very high an increase might harm growth. The impact of growth on poverty depends on distribution and its change over time, with any growth having a greater impact on poverty the more equal income distribution is, especially if inequality declines with growth. The evidence suggests that average education tends to rise with more equality, but there is little impact on average health levels. Crime is strongly associated with vertical inequality. And there is evidence that political instability rises with HIs. Broadly, then, the evidence suggests that there are instrumental reasons for reducing VI and HI in societies where inequality is high – in relation to growth, poverty reduction, crime and political violence.

5. Measurement

In order to ascertain prevailing levels of inequality and changes over time there is a need to have an effective means of displaying distributions and of comparing them to one another – ideally through a summary index. Deriving such an index is complex as it

involves comparing the incomes (or other attributes) of all individuals (or groups) within a society and incorporates an implicit or explicit sensitivity to transfers among them. Most attention has been paid to measures of VI. Here I briefly summarise some issues.

5.1　Vertical inequality

Measures of vertical inequality seek to represent how income or another attribute (I refer here to income for simplicity) is distributed among individuals or households in a population. The measures could and should be applied to basic functionings, such as education, health, nutrition. Subject to data availability, the same type of measurement is appropriate. Where variables are not continuous some adjustments will need to be made. The simplest measures are ratios of the amount of a given good in the top versus the bottom of the population (e.g., the top quintile to the bottom quintile). A recent suggestion is to develop an index calculated as the ratio of the share of the top 10 per cent to the share of the bottom 40 per cent. It is argued that this is a representation of the whole distribution since the middle 50 per cent of the distribution almost always accounts for around 50 per cent of the income. It is suggested this should be termed the 'Palma coefficient' since it is derived from work by Gabriel Palma (Cobham and Sumner 2013). More sophisticated measures consider the whole of a distribution – most simply represented by ranking the members of a society from poorest to richest and then plotting their cumulative share in the population against their cumulative income, as in the well-known Lorenz curve. Summary measures which fulfil some basic axioms of a 'good' measure are:[14]

>> The Gini coefficient, which is widely used and consequently understood intuitively, but gives most weight to the middle of the distribution and is not strictly decomposable.

>> The Theil general entropy which is decomposable (Theil 1967), so that one can attribute a portion of any aggregate measure of inequality to particular elements in the population (between groups and within groups).

>> Atkinson class of indices (Atkinson 1970) which includes an explicit normative element of 'inequality aversion', and varies according to its value.

>> For UNICEF purposes the most straightforward measures are sufficient – i.e. the share of income of quintiles, with emphasis on the lowest two quintiles since these are the poorest groups.

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[14] These include symmetry, independence of population size and level of income and transfer sensitivity: Cowell, F. A. (1995). *Measuring inequality*. London, Prentice Hall/Harvester Wheatsheaf; Sen, A. (1997). *On economic inequality*. Oxford, Clarendon Press..

5.2   Horizontal inequality

For measures of inequality between groups, some particular problems arise. Where there are just two groups in society (e.g. men and women) the most straightforward measure consists of ratios of performance on the particular element of interest. One possibility, which is that normally adopted, is to take the average performance of each group. But there are several complications which can make this apparently straightforward procedure misleading, especially where there are more than two groups and they are of unequal size.

First, for many types of classifications there are more than two groups – for example, in Nigeria it is estimated that there are more than 250 different ethnic groups. Hence one has to decide whether to develop a summary indicator for all these groups, or just to make comparisons of the major groups either with each other, or with the national average. Which is appropriate depends on the purpose of the exercice. For estimating whether HI in a society is greater than another, or is increasing over time, one does need a single summary measure. But for identifying major policy issues, a simple comparison of each major group with national averages may be sufficient.

A second problem is that many groups differ in size, rendering it necessary to decide whether to weight any inequality by group size. Again, for a picture of the total inequality in a society it makes sense to weight by population size, as otherwise the performance of a small group can make a society appear extremely unequal. The population weighted coefficient of variation among groups (GCOV) provides a useful summary indicator of HI as a whole in a country.[15]

However, I should emphasise that in country work this measure is likely to be much less useful for UNICEF than simple ratios of each group's performance to the national average, and/or to each other. Moreover, such an aggregate measure can conceal what one really wants to know – e.g. how a particular minority group fares as compared with the average of the society as a whole. Hence, wherever possible, it is preferable to use binary comparisons – either across two salient groups (such as men and women; Christians and Muslims; North and South), or between each group of concern and average (such as Malays, Chinese and Indians in relation to the average performance of Malaysia as a whole).

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[15] GCOV =

$$\frac{1}{\bar{y}}\left(\sum_{r}^{R} p_r (\bar{y}_r - \bar{y})^2 \right)^{\frac{1}{2}}$$

Where y = per capita income (or other variable such as years of education per person), there are R groups, and p is the population of each group.

An alternative approach is that adopted by the World Bank in defining and measuring inequality of opportunity (Barros and World Bank. 2009). They define equality of opportunity as a situation where there is a 'level playing field so that circumstances such as gender, ethnicity, birthplace, or family background, which are beyond the control of an individual, do not influence a person's life chances' (p 1). They develop a composite index which adds together all the inequalities in probabilities of particular outcomes arising from a (predetermined) set of dissimilar circumstances. Essentially, the index represents a summation of a large number of separate sources of inequality of opportunity – including the elements noted above, i.e. ethnicity, birthplace, gender, parent's education and so on. It represents a good index of inequality in what it intends to measure – opportunities or life chances outside the individual's control for a society taken as a whole. As an aggregate index it could be used as a representation of inequity, since most people would agree that a person's fortune should not be affected by circumstances beyond their control.

However, from a political and policy perspective, by conflating many types of HI it is less helpful. From a political perspective, ratios of outcomes (or odds of achieving outcomes, which is another method of assessment) is relevant: i.e. for example, inequalities between Muslims as a group and Hindus in India are relevant, rather than a composite which includes the effect of father's occupation and education, caste, location, gender etc. (Chakrabarty 2001; Majumdar and Subramanian 2001). From a policy perspective also, we need to know between which particular types of group, major inequalities are to be found. While the composite index can be decomposed, so it is possible to say how much of the inequality of opportunities is due to particular inequalities, we also need to know the actual level of inequalities and not only their contribution to the total.

The observed attribution of inequalities to different circumstances may also conceal the true sources of inequality. For example, it may be observed that 40 per cent of difference in probabilities of attaining a particular income is due to being rural; 40 per cent to education of the father; and 20 per cent to being indigenous. Yet being indigenous may account for historic differences in education and location, so that the true driver of much of the observed inequalities is being indigenous rather than father's education or being rural.

In sum, I see the opportunity inequality index as a useful way of summarising inequity for a society as a whole, but it is too aggregate for developing country policies towards HIs. The recommended method of assessing individual inequalities of outcome via

probabilities could be used for calculating HIs, although it is more demanding econometrically than simple averages.

A third issue is that there is invariably inequality *within* each group, raising the question of whether to compare the distributions of each group with every other group as a whole, or simply compare the average performance of each group – which is what is typically done. Yet it is desirable to take into account the distribution as a whole, as the political, economic and policy implications differ according to how the whole distributions compare.

As a start, the performance of the whole of each group may be plotted graphically. The ratios of performance at different points in the distribution (e.g. for each quintile) is a way of providing this information in summary form. We could call this approach *the q-means*. A simple approach to making such a comparison consists of dividing the income distribution of each group into quantiles and comparing group means for each quantile (to be described as *q-means* henceforth). This approach allows us to see how the richest quantile of one group compares with that of others, and similarly for the other quantiles.

A more comprehensive way of comparing HIs across distributions is offered by a general means approach, derived from the work of James Foster.[16] The formula for this is presented in Box 1 in the appendix to this paper. The method weights different parts of the distribution differently, according to a variable *α*. For values of $\alpha < 1$ the values are more sensitive to population performance at *low levels* of achievement, increasingly so as *α* becomes smaller. For values of $\alpha > 1$ more weight is given to *higher achievements*. Comparing α-means for different values of *α* thus indicates how HIs differ in different parts of the income distributions of the two groups.

This approach is illustrated using income data from the 1996 and 2001 South African censuses (Figure 3). [17]

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[16] Foster, J. E., L. F. Lopez-Calva, et al. (2003). 'Measuring the Distribution of Human Development: Methodology and an application to Mexico'. *Estudios Sobre Desarrollo Humano*. Mexico, PNUD Mexico. Foster et al. define these parametric means as "general means".

[17] Data obtained from the Integrated Public Use Microdata Series (IPUMS) at the Minnesota Population Center, University of Minnesota.
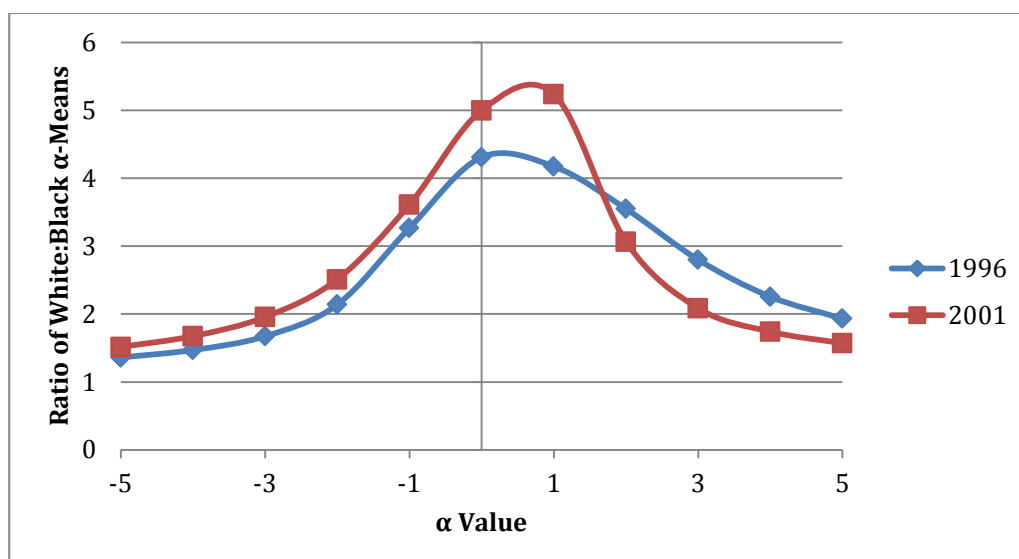
Figure 3 Comparison of White/Black α-mean ratios, South Africa 1996 and 2001

What Figure 3 shows is that differences between blacks and whites are highest in the middle of the distribution, while they are less for both the rich and the poor. This is true both in 1996 and 2001. Comparing 2001 and 1996 shows that the gap between rich blacks and rich whites has lessened, while that between middle income and poor blacks and poor whites has widened. From a policy perspective, this shows that since the end of apartheid, policies have been effective in reducing gaps among the rich, but not among the rest of the population, indicating that there is more need for policies to be directed particularly in the middle and lower end of the distribution. In fact, the mean gap has been falling concealing the widening at the lower ends of the distribution.

 The main difference between the *q*-means and the *α*-means approaches is that whereas *q*-means are calculated on sections of the group's income distribution, α-means are calculated over the entire range of the group's distribution but with different portions weighted differently according to the value of α.

The important point being made here is not that any particular measure of group inequality is the best, but to emphasise that it is necessary to look at the whole distribution of groups and compare them, as a guide to redistributive policy.

As far as UNICEF is concerned, the quantiles method is the most intuitive and easiest to adopt.The comparisons across the whole distribution are also best performed in a two group context.

Since UNICEF is particularly concerned with women and children, a classification on the lines suggested below is appropriate, with calculations made for each element of concern (i.e. incomes; education; health etc,):

Table 1: _Presenting data on horizontal inequalities_				
Performance of	Females	Males	Ratio females/males	
Group A				
Group B				
Ratio of A/B				
Total				
Children in A				
Children in B				
Ratio of children A/B				
Total children				
Children in B by quantile				
Children in A by quantile				
Ratio of children A/B by quantile: e.g. Top 20% Second quintile Third quintile Fourth quintile Bottom 20%				
Total children by quantile				

The category 'children' could be subdivided by age; and one could add a category for old people.

The discussion up to now has been concerned with measuring inequality at a particular point in time. But as argued earlier persistence of deprivation over time is relevant to any overall assessment. Mostly, measures of inequality over time simply take societal indicators (e.g. of the Gini coefficient) and do not incorporate information about whether it is the same or different individuals that are deprived. Panel data permit an assessment of household and individual mobility (normally in the space of income), and this can be differentiated by group (e.g. gender, ethnicity or race) to assess different rates of mobility. Another approach is to explore education transmission rates across generations. For example, an assessment comparing Muslims and Hindus in India showed that Hindu children were much more likely to exceed the educational levels of their parents than Muslim children (Bhalotra, Langer et al. 2008). Data permitting, a similar exercise could be performed with other capabilities, such as nutrition.

6. Appropriate indicators

Choice of indicator depends on three factors: first, the 'space' of interest; secondly, the measure that would be appropriate for that space in the particular society; and thirdly, data availability.

The issue of 'space' was discussed in Section 1. I concluded there that the capabilities approach of Sen was preferable to a resource-based approach but that one should measure functionings rather than capabilities. Moreover, one should not attempt to measure the whole range of capabilities, since some are quite trivial, but pick out some basic ones, including measures of health, nutrition and education, as well as a measure of incomes as a summary indicator for some other capabilities. In addition to a list of basic capabilities, it can also be helpful to include some important determinants of these capabilities (or inputs), since inequalities in outcomes can be the consequence of inequalities of inputs and policies generally operate on inputs. Access to energy is a good candidate for most societies, as is transport, and access to clean water is a strong candidate. Moreover, earnings opportunities (including formal sector employment opportunities and wage rates) may be fundamental determinants of unequal outcomes. Some elements are both inputs and outputs (such as education).

The list of both basic capabilities and important inputs may vary according to the level of development – for example, in developed countries access to housing might well be included. There's no *right* list of capabilities, and this needs to be debated within UNICEF and in each country. It is important to capture inequalities in inputs as well as capabilities in areas where there are major deficiencies and inequalities.

Moreover, the earlier discussion concluded that measures of political power and participation and of cultural recognition are also important.

In addition to the broad capability to be included, the appropriate indicator of any capability varies across societies according to levels of development, climatic considerations and societal preferences. Thus IMR/child mortality/maternal mortality rates are relevant to all countries, but they need to be supplemented by other health measures for richer countries. Richer countries face fewer problems of undernutrition and more of obesity, while middle income countries face both. For education, tertiary access may be more relevant for higher income countries such as those in Latin America than primary and secondary education since universal enrolment may have been achieved. For assessments within countries, it is

more important to have the best indicators for that country rather than ones that are internationally comparable.

For UNICEF, a first requirement would be a consultative process to determine the main elements to be covered and the best indicators in the particular country.

Then there is the issue of data availability, which in the short-run may determine selection of indicators. The potential choice has widened with the extensive DHS, Living Standard Measurement Surveys, and UNICEF Sentinel Sites. If data inadequacies appear – given decisions made about priority indicators – then a priority will be to get the gaps filled by persuading existing surveys to add modules, or carrying out new surveys.

Data are generally completely lacking in the areas of political participation and power and cultural recognition. This is an important issue for minority groups and women, and, more indirectly, for children. Children suffer from lack of cultural recognition and respect. As one child in the UK said: *"I'm getting bullied at school. People in the neighbourhood are calling my family "terrorists" and say, "Go back to your own country." I'm worried they'll start saying these things at school. Muslim boys are getting beaten up at school." Fatima (aged 9)*. This is an important aspect of child well-being which needs to be assessed. Focus groups and newspapers are potential sources of information.

7. UNICEF's role

UNICEF's activities include monitoring, advocacy and projects. Before going into detail on these three separately, it is helpful to identify where UNICEF priorities should lie. There is potentially a huge agenda, and UNICEF needs to prioritise within it. Starting from the conclusion (section 2) that group inequality is basically unjust, UNICEF should focus on HIs rather than VI. Where there are major HIs, the situation is thus inequitable as well as unequal. The worst situation for both women and children is to be situated in a poor part of a poor group. Not only is this likely to lead to the worst outcome indicators, but women and children in this situation are likely to be caught in a trap which involves life-long and intergenerational deprivation (Barrón Ayllón 2005; Bowles, Gintis et al. 2005; Paes de Barros, Ferreira et al. 2009; Thorp and Paredes 2010).

7.1   Mapping inequality/inequity

Consequently, a first priority for UNICEF in each country (and regionally and globally) is a mapping exercise to identify the characteristics of this subset of children (and women) – where they

are located regionally, in which ethnic or religious groups, are they generally deprived in all significant functionings, or are some particularly deficient; what are the major economic characteristics of the households that are doubly deprived (e.g. landless labourers; informal sector…); are there groups of children both inside and outside the particular 'double deprivation' arena who are also notably deprived – e.g. orphans; homeless children; children of single parent families; refugees or children suffering from violent conflict – these may indeed suffer 'treble deprivation'. A similar exercise is needed with respect to women, and possibly the oldest age groups too.

The inequality/inequity mapping exercise is essential for both advocacy and project development, not only within each country, but it would also inform global advocacy.

7.2   Monitoring

Earlier (section 5), I discussed possible approaches to measurement for both VI and HI, with an emphasis on HI. One can estimate quite sophisticated measures, but for advocacy simplicity is generally preferable. Table 1 above summarised some basic data requirements. The table does not specify the space in which the measures should be. This was discussed earlier. It was recommended that 'basic functionings' and major inputs into them should be assessed, suggesting that health, nutrition, and education would normally be there and also income, but that the list of basic functionings and indicators to measure them is likely to vary according to the country and group situation.

UNICEF is well placed to conduct focus groups with deprived populations to help identify relevant capabilities and indicators. When it comes to indicators, the availability of data constrains choice. But where there are big lacunae, UNICEF can supplement the data through rapid surveys (including its sentinel site work). Most of the data sets focus on outcomes but not inputs – for example, employment activities are often not included. The mapping exercise suggested would need information on this too. But while regular monitoring of outcomes is needed, to assess progress or regress, the mapping exercise including economic activities may be done periodically (e.g. every five years). Focus groups can be helpful in collecting information of political inequalities and inequalities in cultural recognition. Information from mapping and monitoring is essential for advocacy and project design.

7.3   Advocacy

UNICEF advocacy, in my view, should be primarily directed towards justice between women and men, and for children, among different

groups in society. Where there is clear injustice in these respects advocacy would also include pointing to injustices and major sources of these injustices. My impression is that this type of advocacy is already undertaken by UNICEF, though possibly without specificity – e.g. without pointing to a particular group that is suffering from inequality.

A second type of advocacy is to point to particular policy areas (beyond the control of UNICEF) where there should be improvement to bring about justice, including:

>> Fair employment, with monitoring of employment (and particularly public sector employment) for inequalities.

>> Similarly, for fair educational access, also monitoring education at different levels and among different groups.

>> Policy advocacy where there are inequalities, including:

>> Anti-discrimination law
>> Human rights law
>> Support for universal access to basic services
>> Affirmative action where the context is appropriate.

>> Review of public expenditure allocation across groups and advocacy for a fairer distribution (including given special advantage to disadvantaged groups and areas).

>> Review of tax policy, with advocacy of more progressive taxation to support public expenditure on programmes (such as cash transfers and basic health, education and economic programmes) that benefit the deprived groups.

>> Design of policies should be careful to ensure that the most deprived are covered. For example, some conditional cash transfers and means tested schemes tend to omit many of the most deprived because they do not meet the conditions or fail to come forward.

Advocacy activities might include a summary of the country mapping with an assessment of how equitable the society is, and of major policies relevant to improve equity in the country context. Ideally, each country would have a document entitled something like: 'Equity in [Bolivia]: Justice for Children NOW'.

7.4   Projects

Projects should be focused on the children (and their families) identified as especially deprived in the mapping exercise. This should identify the main problems. Focus needs to be on how to

sustain progress, and allow these children to escape the deprivation trap. Consequently, it is not only a matter of health and education, and of transfers, but also of potential economic activities.

8. Does this agenda depart from current UNICEF policies?

In general, as far I can see, the discussion above is quite consistent with UNICEF's current approach. There are areas where UNICEF's approach could be sharpened and systematised, but most aspects are already covered. Possible amendments include:

8.1   Definition of equity

A more precise definition of 'equity' would be useful. Definitions adopted are often vague. The interpretation offered by Bamberger and Segone (2012) appears to be basically in line with the discussion above: 'the goal is to eliminate the unfair and avoidable circumstances that deprive children of their rights. Therefore, inequities generally arise when certain population groups are unfairly deprived of basic resources that are available to other groups.' (p 3).

An important issue is whether equity is to be defined in terms of *capabilities* or *functionings*, or between opportunities and outcomes (which is a common way of presenting this choice). While equity is often defined in terms of opportunities/capabilities, for children, as argued earlier, it is *outcomes/functionings* that are important and not opportunities/capabilities. Would we be satisfied if children had the capability of being educated, but in fact were not, e.g. because of parental choice? It would probably be argued then that they didn't really have the opportunity/capability and a similar argument would be made for most (perhaps all) other differences between opportunities and outcomes. Even if it is the child herself who chooses not to go to school or not to be well-nourished – in circumstances when these outcomes could be achieved – we would still probably not be satisfied with the outcomes. It follows that we should focus on outcomes or functionings as the best basis for considering equity.

I would therefore recommend that equity be defined as fair or just outcomes or functionings; and that this involves equality in basic outcomes among different groups of children, where groups are differentiated by region, ethnicity, race, religion, household composition (i.e. female headed households; orphans), disability, gender and citizenship status (i.e. citizens; non-citizen immigrants; refugees). The appropriate classification will vary across countries.

8.2   What are the basic dimensions?

UNICEF documents include major basic dimensions, such as preventable diseases, HIV/AIDs, child mortality, illiteracy, non-registration at birth, exploitation and violence, and malnutrition. As with many other such lists, the selection appears somewhat arbitrary. Focus groups could be used to identify priority dimensions and inputs. Aspects of cultural recognition and political power are mostly lacking from UNICEF's current approach. In addition it is important to identify major factors likely to determine these outcomes, (including access to school, health services and water) and quality of these services; education of parents (especially mother's); household incomes.

8.3   Mapping

The major elements recommended above are included in UNICEF documents which nicely summarise the mapping requirements and responses to problems. What is perhaps missing is how a country office would go about identifying which groups to map; the identification of outcomes and inputs; and a systematic approach to data collection, analysis and presentation.

8.4   Situation analyses

A comprehensive analysis of the country situation with respect to equity and equality is needed. It is helpful to add the historical context to any contemporary assessment, since this is normally the origin of current inequities. In addition, the development of the economy and ecological factors are relevant. Economic developments often lead to inequities by enriching one group or area and sometimes impoverishing another. A case in point would be the discovery of oil in one part of the country. Worsening agriculture/non-agriculture terms of trade is a historic and contemporary source of inequities, as is the development of cash crops in just one part of the country. When it comes to inequities, for example, between north and south in Nigeria these are the relevant factors.

In advocacy too, it is important to include the economy, employment and other earnings opportunities of households where they form the major source of problems (as with *Adjustment with a Human Face* and *Recovery for All* (Cornia, Jolly et al. 1986; Ortiz and Cummins 2012). These are important determinants of equity or lack of it. UNICEF might give greater attention to causes of inequity or ways of correcting it, such as through the structure of taxes, land distribution policies and the use of the law to enforce anti-discrimination and support human rights. Of course, which of the

many possible topics for advocacy are most relevant needs to be decided in relation to the circumstances of each country.

9. Conclusion

An equitable distribution is a fair distribution. This broadly means one in which advantage or disadvantage is not determined by circumstances outside the agent's control. Equality of outcomes across major racial, ethnic, regional, or gender groups is thus equitable. For children, in particular, any substantive inequality is not equitable, since children do not control their circumstances. In other words, equity for children involves equality of significant outcomes. No society is equitable in this sense, but some are much closer to it than others.

An institution like UNICEF cannot by itself bring about equity. But it can (i) monitor major inequities and sources of inequality among children (which must include the circumstances of the households in which they live); (ii) identify the most important dimensions of inequities, in terms of determining life chances of children, which especially relate to their health, nutrition and education; (iii) identify the cause of major inequities, including overt and implicit discrimination, historic deprivations, the structure and development of the economy, and the distribution of public expenditure; (iv) aim to contribute to the correction of these causes through advocacy – including publicising the inequities and their causes – monitoring of economic developments and outcomes, government expenditure allocations, and policies towards discrimination and the correction of inequalities; and (v) of course directing UNICEF's own projects to areas identified as helpful in correcting inequities.

Let me end by reflecting on research priorities that arise from this work. They fall into four areas:

1. Research into the *factors that enable children and families to move upwards*. What are the best ways to assist children to move out of acute deprivation. How much can individual projects achieve? Can more be achieved through changes in government policy? Which policies? Is education the best way to support an escape from deprivation for deprived groups, or must discrimination also be tackled? How far can cash transfers create a sustained change in families' positions? To answer these questions, a combination of panel studies of mobility among different groups, and country studies comparing success and failure in moving towards greater equity would be appropriate.

2. *Law and equity and children*. Here the aim of research would be to identify how far laws (and their implementation) can contribute to improving equity. A particularly vital issue is access to legal

processes by the deprived to assert their rights. What determinies this? Should this be an area UNICEF works in?

3. *Factors behind equitable policy change*. Here we can differentiate political and psychological factors.

a) Political change in an equitable direction generally has to be fought for, by the groups who are deprived, at a local level (e.g. women's cooperatives and pressure groups), and women's participation in local government, and at a macro-level (via social movements and political parties). Research here would be directed to ascertain which local level groups of this kind work best in terms of achieving equitable change, and whether and how external agencies can assist these groups at the local level.

b) Social psychology is important in determining how far people are prepared to support redistribution in general, and in particular across identity groups where resistance may be greater. Research would be designed (through surveys and experiments) to identify what factors make support for redistribution more likely. Does contact between groups have a positive role? How far do national policies towards educational curricula and national holidays persuade people to be more supportive of redistribution? This area of research applies globally as well as nationally.

4. *Measurement*: as noted earlier, much more progress has been made in measuring vertical than horizontal inequality. UNICEF could take the lead in developing indices of HI among children across countries and over time: and in taking forward existing indices on female inequality.

Appendix

The general means approach to measuring HIs

A more comprehensive way of comparing HIs across distributions is offered by a general means approach, derived from the work of James Foster.[18] The formula for this is presented in Box 1. Basically, it calculates group means for each group at different points of the income distribution, using parametric means. The value of the parameter, *α,* determines how much weight is given to different sections of the distribution. Hence the estimate of HI varies according to the chosen value of the parameter. Where *α* =1, the measure is equivalent to a normal mean.[19] For values of $\alpha < 1$, α-means are more sensitive to population performance at *low values* of achievement, and increasingly so as *α* becomes smaller. For values of $\alpha > 1$, more weight is given to *higher achievements*, again increasing the higher the value of *α,* and where α=1 (the arithmetic mean) the value is most sensitive to median incomes. Comparing α-means for different values of *α* thus indicates how HIs differ in different parts of the income distributions of the two groups.

Box 1: The α- means approach to measuring HIs across different segments of the groups' distributions

A general mean is defined as

$$\overline{X}_{\alpha} = \left(\frac{1}{n} \sum_{i}^{n} X_{i}^{\alpha} \right)^{1/\alpha} \qquad \alpha \neq 0, \alpha \in \Re$$

$$\overline{X}_{\alpha} = \exp\left(\frac{1}{n} \sum_{i}^{n} \ln(X_{i}) \right) \qquad \alpha = 0$$

where X_i is the income level of person *i*, n is the population size, $\overline{X}$ is the general mean value of X for the population (or group) and α is a scalar.

The calculation of general means, following the above formula, needs to be made for each relevant group, and then the results compared across groups as shown in Figure 3 in the text.

Where X_i is the income level of person *i*, *n* is the population size and α is a scalar.

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[18] Foster, J. E., L. F. Lopez-Calva, et al. (2003). Measuring the Distribution of Human Development: Methodology and an application to Mexico. *Estudios Sobre Desarrollo Humano.* Mexico, PNUD Mexico. Foster et al. define these parametric means as "general means".

[19] ($\alpha = 0$) is the geometric mean; and ($\alpha = -1$) is the harmonic mean.

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