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Inequality and Poverty in Africa in an Era of Globalization

Looking Beyond Income to Health and Education

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Abstract

This paper describes changes over the past 15-20 years in non-income measures of wellbeing—education and health—in Africa. We expected to find, as we did in Latin America, that progress in the provision of public services and the focus of public spending in the social sector would contribute to declining poverty and inequality in health and education, even in an environment of stagnant or worsening levels of income poverty. Unfortunately, our results indicate that in the area of health, little progress is being made in terms of reducing pre-school age stunting, a clear manifestation of poor overall health. Likewise, our health inequality measure showed that while there were a few instances of reduced inequality along this dimension, there was, on balance, little evidence of success in improving equality of outcomes. Similar results were found in our examination of underweight women as an indicator of general current health status of adults. With regard to education, the story is somewhat more positive. However, the overall picture gives little cause for complacency or optimism that Africa has reaped, or will soon reap the potential benefits of the process of globalization.

Keywords: health, education, wellbeing, Africa

JEL classification: I18, I28, I32

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1 Introduction

How globalization affects poverty and inequality in developing countries is the subject of considerable debate, a debate that is complicated by the fact that globalization means different things to different people. For applied work, the question of how to define globalization in a conceptually meaningful and empirically feasible way is quite demanding, with little clear agreement in the literature as to the best way forward. But if the literature to date has been less than decided about the proper definition of the cause in the globalization-to-poverty/inequality relation, it has been quite consistent on the effect variables: both poverty and inequality are almost always measured in terms of income (or proxies for it), especially in the empirical literature. (Deaton 2004 is an important exception.) Our goal in this paper is to challenge that consistency by examining poverty and inequality of non-income dimensions of wellbeing. In doing so, we take seriously Sen's argument that wellbeing is multidimensional (Sen 1979, 1985, 1987; Drèze and Sen 1989), an idea that is widely accepted in theory, but much less common in empirical work. Nevertheless, there are readily available and useful empirical measures of important non-income dimensions of wellbeing. It is those measures that interest us here. This is not to say that income poverty and inequality are unimportant, but rather, that income is not the only dimension of wellbeing that matters, in theory and in applied work.

To further motivate our work, it is important to recognize that there is a low correlation between incomes and many other measures of living standards, particularly health. This is the case both when the correlations are done for household within a country, as well as when cross-country correlations are examined (Haddad et al. 2003; Appleton and Song 1999). Most importantly for the present analysis, in a prior paper using similar methods, we find that in Latin America, where progress on income poverty has been modest and where income inequality may well be worsening, health and education poverty and inequality have both decreased significantly over the past 15-20 years in virtually every country for which we have data. This paper examines whether the same is true in Africa.

While we are greatly concerned with broadening the definition of poverty and inequality in empirical work, we are noncommittal about the proper definition of globalization. While we will examine some correlations between our poverty and inequality measures and a standard measure of openness (trade divided by GDP), for the most part, we assume that globalization is occurring in Africa (as elsewhere) and that there is more of it now than there was 15-20 years ago. Given that assumption, observed changes in non-income poverty and inequality can be correlated with globalization, though inferring causation would be a heroic leap.

The particular measures that we use are children's heights, women's body mass, and women's educational attainment. The first two are good measures of health, the third of education, two dimensions that are important capabilities. Indeed, the human development index, inspired by Sen's work, includes an income indicator (GDP per capita), a health indicator (life expectancy at birth), and an education indicator (adult literacy). We focus on the latter two pillars, and compare progress in these dimensions both in terms of levels of deprivation—measured in terms of the share of the population that are malnourished and have not completed primary schooling—as well as the changes in the distribution of these outcomes among the population.

In addition to their theoretical importance, we choose these indicators for two practical reasons. First, they are widely available for many countries and at several points in time during the past 15-20 years,[1] allowing us to examine a large number of spells of change in these indicators. Second, both anthropometry and educational attainment are far less subject to measurement error than income and expenditures measures, and both are directly attributable to individuals so that we avoid the difficult issue of intra-household allocations.

Our methods are largely descriptive. We first examine how health and education poverty and inequality change over time in a given country. We then decompose the observed changes in poverty into a component due to the change in the mean and another due to the change in the dispersion of the distribution. That is, we examine to what extent the change in health and education poverty across spells can be attributed to a change in the mean of the distribution, holding the dispersion constant, versus the change in the dispersion while keeping the mean constant. Doing so allows us to relate and compare the relative importance of changes in inequality to the overall process of improvement or deterioration in living standards. Based on our empirical results, we highlight the limited progress observed in Africa in improving health and education outcomes, and contrast that with other regions of the world where globalization has been accompanied by more favourable outcomes.

2 Data and methods

With large sample sizes and questionnaires that are consistent throughout various countries as well as over time, the demographic and health surveys (DHS) are nationally representative surveys that provide data that are well suited for our analysis. We use data from 64 DHS from 23 African countries. We have selected countries that have data from at least two DHSs. These data provide us with 40 spells—usually around five years in length—of change in health and education outcomes that we use in our paper. A standard stratified and clustered design is used in most surveys to select households. The subject of the interview in each household is one woman aged 15-49, selected randomly. Additionally, children, 60 months or younger (but sometimes 36 months or younger), of the female interview subject are weighed, and their heights recorded. For our analysis, we use the data that reference these women and children.

Since we are interested in *distributions* of wellbeing, we, therefore, must use continuous variables. Discrete variables such as mortality or literacy rates are not appropriate for our study. Similarly, predicted variables, such as mortality probabilities, pose problems, because the distribution is compressed when such predicted variables are derived.

First, we use standardized height of pre-school aged children as a health indicator. See Sahn and Younger (2005, 2006) for reasons why this indicator is particularly predictive. Additionally, many other researchers find that a child's growth provides an excellent objective indicator of his/her general health status. See, for example, Cole and Parkin 1977; Mata 1978; Tanner 1981; Mosley and Chen 1984; WHO 1995; Martorell et al. 1975, Beaton et al. 1990; Strauss and Thomas 1995; Behrman and Deolalikar 1988. As Beaton et al. (1990: 2) state it: growth failure is '… the best general proxy for

[1] Specifically, we rely upon the demographic and health survey (DHS) data described below.

constraints to human welfare of the poorest, including dietary inadequacy, infectious diseases and other environmental health risks'. Furthermore, Beaton et al. (1990) note the utility of stature as an indicator is due to the fact that it embodies the multiple dimensions health and development, as determined by an individual's socioeconomic and environmental circumstances.

The z-score is used most often to analyse children's heights (or weights) (WHO 1983). This age and gender standardized measure basically reflects the standard deviations and can be negative (and usually are negative in among the poor). Most standard *distributional* statistics, however, necessitate positive value for the welfare measure. Therefore, we choose to work with 'standardized heights', calculating this variable as the height that this child would have if s/he were a 24-month old girl. We basically assign a child the height corresponding to the same z-score in the 24-month-old girls' distribution. We thereafter assign a poverty line for this variable defined as the standardized height two standard deviations below the median of the distribution of the reference population of healthy children.

Second, we employ the body mass index (BMI) for women aged 15-49, as another health indicator. The BMI is calculated as weight (in kilograms) divided by height (in metres squared). For both children's heights, and the BMI variables, we choose a conventional cutoff point of 18.5 as a poverty line, as determined by the World Health Organization. An important consideration with the use of BMI is that welfare (unlike for height, education, or income) does not necessarily increase monotonically with BMI. Although 'more is better' is a standard axiom of most distributional measures, the share of overweight or obese women in Africa is small enough to allow us to interpret our results for this variable as if this axiom applied.

Third, to assess changes in level of education and education inequality, we analyse years of schooling for women. We seek to eliminate from consideration any women who have not yet reached the age to complete their post-secondary school;[2] thus, we limit our analysis to women at least 22 years of age. The upper limit of our indicator, 30 years of age, ensures that we focus our attention on women who have completed their education relatively recently. We note the limitation in the use of years of schooling as an indicator of wellbeing since it does not take into account differences in school quality that may affect the value of the education received. The variability in school quality, however, is implicitly assumed to be negligible for our study since we are making our comparisons within countries and over relatively short timeperiods (usually five years). We arbitrarily define the education poverty line as having completed six years of schooling. We also varied the education poverty line three years above and below the defined 6-year line to test the sensitivity our measure and find that such choices did not significantly affect our results.

2.1 Measuring poverty inequality

Given the poverty lines defined above, we use the headcount as our poverty measure, i.e., the share of the sample that falls below the poverty line. For inequality, we follow

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2 Because few of the women in the survey actually attend post-secondary school, we could have chosen a lower limit of 18 rather than 22. We find that the results we report later in this paper would be almost the same had we chosen 18 as our lower boundary for our indicator.

the standard approach used in the income literature where we examine the variation or dispersion of a health or educational outcome *per se*.[3] This 'univariate' approach to measuring non-income dimensions of inequality contrasts with the more common approach to examining health (and education) inequality which examines differences in health (or other social indicators) across a variety of social and economic strata such race, ethnicity, location, gender and, most commonly, income. Making comparisons of health or education across populations with different social and economic characteristics is often referred to in the literature as the 'gradient' or 'socioeconomic' approach to health inequality.[4]

We would argue that the univariate approach is the correct one, at least in the context of our efforts to promote the notion that wellbeing should be measured in multiple dimensions. The gradient approach implicitly gives primacy to inequality in the income dimension. Inequality in the dimension of health or education is only relevant insofar as it is correlated with income inequality. By implication, a given distribution of health or educational outcomes is only undesirable if it is correlated with the income distribution, but acceptable if it is not, an implication of the gradient approach which makes it undesirable for our purposes. Given our univariate approach, we use the Gini coefficient to measure inequality.

2.2 Decomposition

To decompose changes in poverty, we note that any distribution can be characterized by its mean and it Lorenz curve. Datt and Ravallion (1992) demonstrate that it is possible to decompose the change in the share of the population that falls below the poverty line into two components. The first is changes in the mean of the distribution; and the second is changes in its dispersion. Following Datt and Ravallion (1992), then, we express the share of a population that are poor as a function of its mean, μ, its Lorenz curve, L, and the poverty line, z. The change in poverty between two periods can then be decomposed, first, into a growth component representing the change in poverty resulting from a change in the mean of the distribution, while holding the Lorenz curve constant at that of the reference sample, and second, a redistribution component reflecting the change in the Lorenz curve, while holding the distribution's mean constant with that of the reference sample (Datt and Ravallion 1992).

We avoid the problem that the Datt and Ravallion decomposition is not robust to the choice of reference sample, by relying on Kakwani's (1997) approach, and averaging the Datt and Ravallion decompositions calculated with each sample as the reference. We

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3 We follow previous work using the univariate approach, including Thomas, Wang and Fan (2000) and Lopez, Thomas and Wang (1998) who develop the concept of an education Gini index based on school attainment data for working-age adults and Pradhan, Sahn and Younger (2003), Le Grand (1987), and Murray, Gakidou and Frenk (1999) who apply the univariate approach to health.

4 See, for example, van Doorslaer et al. (1997); Wagstaff, Paci and van Doorslaer (1991); Wagstaff and van Doorslaer (2004) in the case of health, and Filmer and Pritchett (2001) in the case of education. The gradient approach is useful for examining the correlation of a health or educational outcome with a given characteristic. Interest in this correlation arises from various types of discrimination, prejudice, and other legal, social, and economic norms that may contribute to stratification and fragmentation, and subsequent inequality in access to material resources and various correlated welfare outcomes.

and others have previously employed this method (Sahn and Younger 2005; McCulloch, Cherel-Robson and Baluch 2000; Dhongde 2002; Shorrocks and Kolenikov 2001). This practice, in addition to being consistent with the axiomatic properties discussed by Kakwani, eliminates the difficult to interpret residual in the decomposition methodology.

3 Results

We first consider the headcounts and Gini coefficients for each of our indicators of wellbeing in each country and survey (Tables 1, 2, and 3). To summarize our findings for children's heights: among the 39 spells, the headcount worsened in 13 cases, improved in 13, and remained unchanged for 13. Important differences, both between countries and within a single country, for which we have more than one spell, are necessarily obscured by such a summary. A closer look reveals, for instance, that between 1992 and 2000, there was a marked decline in the share of children who are stunted in Namibia whereas in Niger, for the same period, just the opposite was observed. We also observe that for those countries with more than one spell, quite often the changes over time occur in different directions. This is illustrated by the case of Zimbabwe which experienced a marked decline in the headcount between 1988 and 1994, only to witness a substantial worsening between 1994 and 1999. In Nigeria, the health of children that deteriorated between 1986 and 1990, and, again between 1990 and 1999, similarly, showed improvement in 2003 when a substantial decline in the headcount was observed. Thus, looking at these specific cases between and within countries, it is evident that no steady improvement in children's heights can be clearly observed.

Table 1
Poverty headcounts and Gini coefficients for children's heights

			Tests for equality				Tests for equality		
	Survey	Headcount	vs. 1st	vs. 2nd	vs. 3rd	Gini	vs. 1st	vs. 2nd	vs. 3rd
Burkina Faso	1992	0.353				0.0386			
	1999	0.383	1.96			0.0399	1.54		
	2003	0.406	4.09	1.76		0.0444	8.33	5.83	
Benin	1996	0.294				0.0346			
	2001	0.320	1.82			0.0362	2.05		
Côte d'Ivoire	1994	0.289				0.0342			
	1998	0.245	-2.61			0.0346	0.50		
Cameroon	1991	0.272				0.0342			
	1998	0.355	4.65			0.0378	3.64		
	2004	0.348	4.42	-0.42		0.0390	5.01	1.34	
Chad	1997	0.431				0.0440			
	2004	0.437	0.41			0.0490	5.83		
Ethiopia	2000	0.511				0.0388			
	2005	0.475	-2.62			0.0438	6.19		
Ghana	1988	0.320				0.0336			
	1993	0.307	-0.78			0.0353	1.80		
	1998	0.236	-5.20	-4.33		0.0339	0.31	-1.55	
	2003	0.304	-1.00	-0.20	4.24	0.0361	2.77	0.96	2.55

Table 1 continues

Table 1 (con't)
Poverty headcounts and Gini coefficients for children's heights

			Tests for equality				Tests for equality		
	Survey	Headcount	vs. 1st	vs. 2nd	vs. 3rd	Gini	vs. 1st	vs. 2nd	vs. 3rd
Guinea	1999	0.284				0.0389			
	2005	0.371	5.00			0.0423	3.22		
Kenya	1993	0.355				0.0368			
	1998	0.355	0.00			0.0397	3.43		
	2003	0.347	-0.60	-0.59		0.0370	0.20	-3.41	
Madagascar	1992	0.567				0.0330			
	1997	0.564	-0.25			0.0360	4.23		
	2003	0.502	-4.32	-4.17		0.0437	12.71	9.11	
Mali	1987	0.272				0.0347			
	1995	0.368	5.45			0.0405	5.91		
	2001	0.408	7.87	3.75		0.0429	8.25	3.85	
Malawi	1992	0.496				0.0360			
	2000	0.506	0.71			0.0418	8.11		
Mozambique	1997	0.440				0.0401			
	2003	0.425	-1.09			0.0365	-4.93		
Nigeria	1986	0.302				0.0335			
	1990	0.425	8.11			0.0422	9.66		
	1999	0.504	10.80	4.65		0.0519	14.86	8.42	
	2003	0.422	7.57	-0.19	-4.63	0.0453	12.25	3.61	-5.54
Niger	1992	0.439				0.0394			
	1998	0.497	4.18			0.0387	-1.00		
Namibia	1992	0.330				0.0343			
	2000	0.238	-5.60			0.0322	-2.34		
Rwanda	1992	0.489				0.0345			
	2000	0.427	-4.47			0.0402	7.37		
	2005	0.479	-0.66	3.62		0.0377	3.92	-3.07	
Senegal	1986	0.230				0.0311			
	1992	0.262	1.66			0.0346	3.04		
	2005	0.164	-3.38	-7.16		0.0329	1.44	-2.06	
Togo	1988	0.341				0.0342			
	1998	0.262	-4.86			0.0337	-0.52		
Tanzania	1992	0.451				0.0343			
	1996	0.466	1.19			0.0364	2.97		
	1999	0.442	-0.58	-1.47		0.0334	-1.25	-3.71	
	2004	0.385	-5.75	-6.67	-3.62	0.0313	-5.21	-7.97	-2.85
Uganda	1988	0.472				0.0368			
	1995	0.412	-4.25			0.0354	-1.75		
	2000	0.407	-4.53	-0.38		0.0349	-2.38	-0.70	
Zambia	1992	0.428				0.0335			
	1996	0.448	1.58			0.0361	3.93		
	2001	0.512	6.40	4.95		0.0393	8.10	4.49	
Zimbabwe	1988	0.321				0.0305			
	1994	0.254	-4.04			0.0319	1.59		
	1999	0.312	-0.52	3.51		0.0402	9.40	8.75	

Source: The results in columns two through five are from Sahn and Younger (2008).

Table 2
Poverty headcounts and Gini coefficients for women's BMI

			Tests for equality				Tests for equality		
	Survey	Headcount	vs. 1st	vs. 2nd	vs. 3rd	Gini	vs. 1st	vs. 2nd	vs. 3rd
Burkina Faso	1992	0.137				0.0682			
	1999	0.125	-1.50			0.0633	-3.30		
	2003	0.197	9.12	11.07		0.0816	9.85	14.29	
Benin	1996	0.140				0.0770			
	2001	0.101	-5.02			0.0936	8.92		
Côte d'Ivoire	1994	0.079				0.0769			
	1998	0.082	0.53			0.0886	6.09		
Cameroon	1998	0.070				0.0834			
	2004	0.064	-0.89			0.0963	6.37		
Chad	1997	0.194				0.0710			
	2004	0.202	0.93			0.0772	4.13		
Ethiopia	2000	0.281				0.0686			
	2005	0.246	-5.38			0.0717	3.01		
Ghana	1993	0.113				0.0823			
	1998	0.107	-0.68			0.0897	2.68		
	2003	0.091	-2.77	-2.15		0.1011	7.88	4.95	
Guinea	1999	0.113				0.0789			
	2005	0.121	1.09			0.0820	1.75		
Kenya	1993	0.094				0.0784			
	1998	0.109	2.19			0.0832	2.60		
	2003	0.118	4.05	1.43		0.0985	13.40	9.19	
Madagascar	1997	0.190				0.0635			
	2003	0.184	-0.74			0.0732	8.51		
Mali	1995	0.146				0.0728			
	2001	0.114	-5.43			0.0844	9.63		
Malawi	1992	0.086				0.0692			
	2000	0.080	-0.97			0.0728	2.68		
Mozambique	1997	0.109				0.0696			
	2003	0.081	-4.45			0.0796	6.93		
Nigeria	1999	0.156				0.1182			
	2003	0.141	-1.75			0.1003	-6.55		
Niger	1992	0.177				0.0744			
	1998	0.190	1.49			0.0723	-1.35		
Namibia	1992	0.128				0.1007			
Rwanda	2000	0.082				0.0713			
	2005	0.092	2.07			0.0710	-0.30		
Senegal	1992	0.137				0.0875			
	2005	0.174	4.48			0.1084	10.56		
Togo	1998	0.105				0.0779			
Tanzania	1992	0.089				0.0729			
	1996	0.088	-0.16			0.0773	2.93		
	2004	0.095	1.25	1.35		0.0871	11.79	6.80	
Uganda	1995	0.089				0.0685			
	2000	0.094		0.78		0.0785	6.73		
Zambia	1992	0.097				0.0784			
	1996	0.083	-2.25			0.0757	-1.82		
	2001	0.141	7.08	10.14		0.0838	3.80	6.02	
Zimbabwe	1994	0.047				0.0849			
	1999	0.054	1.45			0.0922	3.76		

Source: The results in columns two through five are from Sahn and Younger (2008).

Table 3
Poverty headcounts and Gini coefficients for women's years of schooling

			Tests for equality				Tests for equality		
	Survey	Headcount	vs. 1st	vs. 2nd	vs. 3rd	Gini	vs. 1st	vs. 2nd	vs. 3rd
Burkina Faso	1992	0.940				0.8779			
	1999	0.947	0.95			0.8975	4.13		
	2003	0.905	-4.64	-5.71		0.8552	-5.14	-10.10	
Benin	1996	0.893				0.8100			
	2001	0.898	0.54			0.7564	-8.71		
Côte d'Ivoire	1994	0.862				0.7101			
	1998	0.835	-1.80			0.6723	-4.58		
Cameroon	1991	0.718				0.5462			
	1998	0.543	-9.37			0.4643	-10.08		
	2004	0.523	-11.83	-1.29		0.4061	-19.21	-9.54	
Chad	1997	0.966				0.8718			
	2004	0.947	-2.88			0.8390	-6.69		
Ethiopia	2000	0.878				0.8493			
	2005	0.870	-1.17			0.7870	-17.56		
Ghana	1988	0.507				0.5119			
	1993	0.530	1.23			0.4792	-3.67		
	1998	0.492	-0.83	-2.04		0.4486	-7.39	-3.63	
	2003	0.494	-0.73	-1.98	0.12	0.4330	-9.57	-5.71	-2.02
Guinea	1999	0.927				0.8671			
	2005	0.931	0.52			0.8385	-5.78		
Kenya	1988	0.482				0.4056			
	1993	0.386	-6.41			0.3498	-9.49		
	1998	0.276	-14.38	-7.75		0.2974	-19.67	-10.26	
	2003	0.261	-15.76	-9.01	-1.14	0.3037	-18.33	-8.91	1.33
Madagascar	1992	0.726				0.4891			
	1997	0.748	1.51			0.4982	1.59		
	2003	0.741	1.01	-0.56		0.4760	-2.34	-4.13	
Mali	1987	0.943				0.8962			
	1995	0.933	-1.12			0.8657	-5.55		
	2001	0.929	-1.64	-0.65		0.8603	-6.79	-1.36	
Malawi	1992	0.809				0.6402			
	2000	0.739	-5.52			0.4978	-22.87		
Mozambique	1997	0.924				0.6549			
	2003	0.893	-3.93			0.6190	-6.72		
Nigeria	1986	0.661				0.4990			
	1990	0.809	8.87			0.6706	22.91		
	1999	0.625	-2.04	-15.34		0.5329	4.63	-24.03	
	2003	0.599	-3.41	-16.49	-1.84	0.5484	6.40	-19.62	2.57
Niger	1992	0.972				0.9230			
	1998	0.947	-4.08			0.8845	-8.78		
Namibia	1992	0.408				0.3551			
	2000	0.228	-11.13			0.2594	-17.46		
Rwanda	1992	0.762				0.5701			
	2000	0.640	-8.81			0.4895	-13.47		
	2005	0.804	3.39	13.72		0.4665	-18.04	-4.64	
Senegal	1986	0.910				0.8433			
	1992	0.903	-0.68			0.7956	-7.49		
	1997	0.871	-3.70	-3.16		0.7509	-15.16	-7.52	
	2005	0.848	-6.32	-5.92	-2.54	0.7196	-22.52	-14.27	-6.26
Togo	1988	0.836				0.6979			
	1998	0.881	3.38			0.6304	-8.72		

Table 3 continues

Table 3
Poverty headcounts and Gini coefficients for women's years of schooling

			Tests for equality				Tests for equality		
	Survey	Headcount	vs. 1st	vs. 2nd	vs. 3rd	Gini	vs. 1st	vs. 2nd	vs. 3rd
Tanzania	1992	0.433				0.4319			
	1996	0.320	-8.29			0.3884	-6.61		
	1999	0.328	-6.36	0.44		0.3824	-6.15	-0.74	
	2004	0.346	-6.68	1.98	1.14	0.3672	-10.50	-3.40	-1.96
Uganda	1988	0.795				0.5494			
	1995	0.758	-2.59			0.5088	-5.70		
	2000	0.699	-6.62	-4.41		0.4580	-13.17	-8.45	
Zambia	1992	0.453				0.3480			
	1996	0.465	0.79			0.3527	0.85		
	2001	0.476	1.44	0.67		0.3407	-1.32	-2.36	
Zimbabwe	1988	0.532				0.3301			
	1994	0.286	-13.15			0.2953	-5.63		
	1999	0.157	-21.61	-8.89		0.2397	-15.37	-10.75	

For inequality of children's heights, we also find more cases of worsening than improvement. Specifically, there are 23 cases where height inequality increased, eight where it declined, and eight where it remained constant over time. Mozambique between 1997 and 2003 stands out among those countries that showed the greatest improvement (i.e., decline) in inequality, while Burkina Faso, Mali and Zimbabwe stand out by witnessing a worsening degree of inequality across the multiple spells in each country.

While the inequality figures have some interest in their own right, our major concern is the extent to which changes in inequality are contributing to, or impairing, progress in terms of the overall reduction in poverty. Tables 4, 5, and 6 present the Datt-Ravallion-Kakwani decompositions of the change in the headcounts for children's heights, women's BMI, and women's educational attainment, respectively. For heights, in 30 out of 41 spells, the absolute value of the mean component of the decomposition is larger than the dispersion share. This is particularly true when the changes are large. A good example of this is found in the three spells from Ghana; in each case the share of the overall change contributed to by the mean shift is at least twice the magnitude of the change in the dispersion. The predominance of the changes in the mean in driving changes in poverty, however, is not to say that the dispersion component is trivial or important. For example, over half of the increase in stunting over the spell in Cameroon, from 27 to 35 per cent, was accounted for by the declining inequality in children's health. We finally note that averaging the impact of both the mean and dispersion affects across all spells, the former equals -0.01 and the latter 0.01. Thus, overall, the average effects of both components of our decomposition are basically zero.

We would expect to see improvements in children's heights concentrated in the leftmost part of the distribution, since there is an upper bound to heights that individuals can attain. If that were the case, then we would tend to observe a correlation between increases in the mean and reductions in the dispersion of the distribution.[5] But that is

5 We do, in fact, find this consistently in Latin America (Sahn and Younger 2006).

not the case here. The mean and dispersion components for children's heights move together in about half of the cases and against each other in half.

Table 4
Datt-Ravallion-Kakwani decompositions for children's heights

Country	Period	First	Second	Difference	t-value	Mean	Dispersion
Burkina Faso	1992-99	0.351	0.380	0.030	-1.940	0.053	-0.023
	1999-2003	0.380	0.402	0.021	-1.584	0.003	0.018
Benin	1996-2001	0.290	0.318	0.028	-1.920	0.024	0.004
Côte d'Ivoire	1994-98	0.286	0.240	-0.046	2.697	-0.052	0.006
Cameroon	1991-98	0.271	0.349	0.078	-4.405	0.035	0.043
	1998-2004	0.349	0.346	-0.003	0.154	-0.011	0.008
Chad	1997-2004	0.426	0.434	0.009	-0.604	0.011	-0.002
Ethiopia	2000-05	0.509	0.471	-0.037	2.705	-0.071	0.034
Ghana	1988-93	0.320	0.303	-0.016	0.984	-0.026	0.009
	1993-98	0.303	0.232	-0.071	4.333	-0.057	-0.014
	1998-2003	0.232	0.301	0.068	-4.268	0.050	0.018
Guinea	1999-2005	0.282	0.368	0.086	-4.952	0.063	0.023
Kenya	1993-98	0.352	0.352	0.000	0.003	-0.031	0.031
	1998-2003	0.345	-0.007	0.004	0.000	-0.011	0.000
Madagascar	1992-97	0.567	0.562	-0.005	0.339	-0.011	0.006
	1997-2003	0.562	0.502	-0.060	4.089	-0.084	0.024
Mali	1987-95	0.271	0.366	0.095	-5.412	0.069	0.025
	1995-2001	0.366	0.406	0.040	-3.771	0.025	0.015
Malawi	1992-2000	0.491	0.505	0.014	-0.963	-0.009	0.022
Mozambique	1997-2003	0.438	0.423	-0.015	1.128	0.017	-0.032
Nigeria	1986-90	0.301	0.421	0.119	-7.902	0.073	0.046
	1990-99	0.421	0.502	0.081	-4.783	0.035	0.047
	1999-2003	0.502	0.420	-0.082	4.639	-0.045	-0.037
Niger	1992-98	0.437	0.495	0.058	-4.177	0.068	-0.010
Namibia	1992-2000	0.329	0.235	-0.094	5.686	-0.080	-0.014
Rwanda	1992-2000	0.486	0.424	-0.062	4.487	-0.093	0.030
	2000-05	0.424	0.474	0.050	-3.512	0.066	-0.016
Senegal	1986-92	0.230	0.258	0.028	-1.434	0.000	0.028
	1992-2005	0.258	0.162	-0.095	6.980	-0.078	-0.017
Togo	1988-98	0.340	0.259	-0.082	4.969	-0.083	0.001
Tanzania	1992-96	0.448	0.463	0.015	-1.178	0.006	0.009
	1996-99	0.463	0.441	-0.022	1.357	0.001	-0.024
	1999-2004	0.441	0.382	-0.059	3.730	-0.059	0.001
Uganda	1988-95	0.470	0.408	-0.062	4.376	-0.052	-0.010
	1988-2000	0.470	0.404	-0.066	4.619	-0.051	-0.015
	1995-2000	0.408	0.404	-0.004	0.341	-0.002	-0.003
Zambia	1992-96	0.426	0.446	0.020	-1.539	0.018	0.002
	1996-2001	0.446	0.508	0.062	-4.790	0.054	0.008
Zimbabwe	1988-94	0.319	0.252	-0.066	4.033	-0.082	0.016
	1994-99	0.252	0.306	0.054	-3.311	0.004	0.050

Source: Sahn and Younger (2008).

Table 5
Datt-Ravallion-Kakwani decompositions for women's BMI

Country	Period	First	Second	Difference	t-value	Mean	Dispersion
Burkina Faso	1992-99	0.137	0.125	-0.011	1.501	0.011	-0.022
	1999-2003	0.125	0.197	0.071	-11.069	0.006	0.065
Benin	1996-2001	0.140	0.101	-0.039	5.016	-0.090	0.051
Côte d'Ivoire	1994-98	0.079	0.082	0.004	-0.534	-0.023	0.027
Cameroon	1998-2004	0.070	0.064	-0.006	0.888	-0.038	0.032
Chad	1997-2004	0.194	0.202	0.008	-0.931	-0.023	0.031
Ethiopia	2000-05	0.281	0.246	-0.035	5.379	-0.045	0.011
Ghana	1993-98	0.113	0.107	-0.007	0.677	-0.029	0.022
	1998-2003	0.107	0.091	-0.016	2.155	-0.066	0.050
Guinea	1999-2005	0.113	0.121	0.008	-1.092	-0.004	0.012
Kenya	1993-98	0.094	0.109	0.015	-2.188	0.001	0.014
	1998-2003	0.109	0.118	0.009	-1.429	-0.044	0.053
Madagascar	1997-2003	0.190	0.184	-0.006	0.736	-0.047	0.041
Mali	1995-2001	0.146	0.114	-0.031	5.429	-0.066	0.035
Malawi	1992-2000	0.086	0.080	-0.006	0.972	-0.016	0.011
Mozambique	1997-2003	0.109	0.081	-0.027	4.445	-0.056	0.028
Nigeria	1999-2003	0.156	0.141	-0.015	1.747	0.030	-0.044
Niger	1992-98	0.177	0.190	0.013	-1.487	0.011	0.002
Rwanda	2000-05	0.082	0.092	0.010	-2.074	0.009	0.000
Senegal	1992-2005	0.137	0.174	0.036	-4.483	-0.036	0.072
Tanzania	1992-96	0.089	0.088	-0.001	0.163	-0.012	0.011
	1996-2004	0.088	0.095	0.007	-1.355	-0.018	0.025
Uganda	1995-2000	0.089	0.094	0.005	-0.776	-0.030	0.034
Zambia	1992-96	0.097	0.083	-0.014	2.253	-0.010	-0.004
	1996-2001	0.083	0.141	0.058	-10.144	0.035	0.023
Zimbabwe	1994-99	0.047	0.054	0.008	-1.446	-0.014	0.022

Source: Sahn and Younger (2008).

Because women's anthropometry was not a standard consideration of the health module of the earlier DHS, we have less data, with fewer spells of information for the case of the share of underweight women. Unlike the results seen upon examining the information on child health, there was no change in the majority of cases in the share of women who are severely underweight (Table 2). An increase was observed for the share of underweight women in only five of 26 spells, while a decline was seen in six cases. Our examination of Ginis for BMI indicates increasing inequality: in 20 out of 26 spells, the BMI distribution became less equal. This rise in inequality is largely due to increased skewing in the right hand tail of the distribution—reflecting in part the increase in BMI of women who were already at the high end of the distribution, even where the share of underweight women in the population remained largely unchanged.

When we examine the BMI decompositions, we find that there are more cases, 13 out of 26, where the mean shift is of a greater magnitude than the dispersion effect. In fact, when taking the average of the mean and dispersion effects across all spells, we find the

Table 6
Datt-Ravallion-Kakwani decompositions for women's years of schooling

Country	Period	First	Second	Difference	t-value	Mean	Dispersion
Burkina Faso	1992-99	0.940	0.947	0.007	-0.950	0.016	-0.009
	1999-2003	0.947	0.905	-0.043	5.710	-0.052	0.009
Benin	1996-2001	0.893	0.898	0.006	-0.536	-0.012	0.018
Côte d'Ivoire	1994-98	0.862	0.835	-0.026	1.802	-0.095	0.068
Cameroon	1991-98	0.718	0.543	-0.175	9.367	-0.189	0.014
	1998-2004	0.543	0.523	-0.020	1.288	-0.038	0.018
Chad	1997-2004	0.966	0.947	-0.019	2.880	-0.021	0.002
Ethiopia	2000-05	0.878	0.870	-0.008	1.175	-0.011	0.002
Ghana	1988-93	0.507	0.530	0.023	-1.227	-0.026	0.049
	1993-98	0.530	0.492	-0.039	2.044	-0.029	-0.009
	1998-2003	0.492	0.494	0.002	-0.121	0.032	-0.030
Guinea	1999-2005	0.927	0.931	0.004	-0.520	0.006	-0.001
Kenya	1988-93	0.482	0.386	-0.095	6.411	-0.039	-0.057
	1993-98	0.386	0.276	-0.110	7.753	-0.122	0.012
	1998-2003	0.276	0.261	-0.015	1.138	0.036	-0.051
Madagascar	1992-97	0.726	0.748	0.022	-1.508	0.017	0.005
	1992-2003	0.726	0.741	0.014	-1.014	-0.017	0.031
	1997-2003	0.748	0.741	-0.008	0.559	-0.017	0.010
Mali	1987-95	0.943	0.933	-0.010	1.117	-0.014	0.004
	1995-2001	0.933	0.929	-0.004	0.647	-0.010	0.006
Malawi	1992-2000	0.809	0.739	-0.070	5.518	-0.136	0.066
Mozambique	1997-2003	0.924	0.893	-0.030	3.930	-0.022	-0.008
Nigeria	1986-90	0.661	0.809	0.148	-8.869	0.136	0.011
	1990-99	0.809	0.625	-0.184	15.337	-0.147	-0.038
	1999-2003	0.625	0.599	-0.026	1.837	-0.092	0.066
Niger	1992-98	0.972	0.947	-0.025	4.076	-0.049	0.024
Namibia	1992-2000	0.408	0.228	-0.180	11.126	-0.127	-0.054
Rwanda	1992-2000	0.762	0.640	-0.121	8.811	-0.126	0.005
	2000-05	0.640	0.804	0.163	-13.722	0.078	0.085
Senegal	1986-92	0.910	0.903	-0.007	0.676	0.044	-0.052
	1992-97	0.903	0.871	-0.032	3.163	-0.059	0.028
	1997-2005	0.871	0.848	-0.023	2.537	-0.072	0.049
Togo	1988-98	0.836	0.881	0.045	-3.378	0.026	0.019
Tanzania	1992-96	0.433	0.320	-0.113	8.290	-0.014	-0.099
	1996-99	0.320	0.328	0.007	-0.441	-0.007	0.014
	1999-2004	0.328	0.346	0.018	-1.144	-0.014	0.033
Uganda	1988-95	0.795	0.758	-0.036	2.589	-0.036	0.000
	1995-2000	0.758	0.699	-0.059	4.409	-0.145	0.086
Zambia	1992-96	0.453	0.465	0.012	-0.794	-0.042	0.055
	1996-2001	0.465	0.476	0.010	-0.671	-0.039	0.049
Zimbabwe	1988-94	0.532	0.286	-0.246	13.151	-0.199	-0.046
	1994-99	0.286	0.157	-0.129	8.890	-0.027	-0.102

Source: Sahn and Younger (2008).

average of the former is –2 per cent and the average of the latter is +2 per cent. So, while the mean effect is contributing to declining average undernourishment among women across the survey, and the dispersion effect just the opposite, the overall magnitudes cancel each other out. The importance of the dispersion effects at the

country level can be illustrated by the most recent spell in Burkina Faso. Between 1999 and 2003 there was a 7 per cent increase in the share of wasted women. This was almost entirely due to increases in inequality, despite that the mean remained nearly constant. Another interesting case of the mean shift and dispersion effects nearly cancelling each other out is the final spell in Kenya, between 1998 and 2003. There was only a one percentage point increase in the share of underweight women. However, if the dispersion remained the same, and the observed mean shift occurred, the share of wasted women would have declined over six percentage points.

We also find that the mean and dispersion effects tend to move in opposite directions in the case of BMI. Thus, we find many instances, for example, where the dispersion is increasing, mostly driven by increases in the right-hand tail of the distribution, which also contributes to overall increases in the mean.

For our final measure of wellbeing—the years of schooling for women aged 22-30—we find a greater proportion of positive spells than with the other indicators. Using a cutoff point of six years of schooling for our headcount measure, we find a statistically significant decline in school poverty in 21 out of 41 spells, a worsening in two cases (Nigeria between 1986 and 1990 and Rwanda between 2000 and 2005), and no change in the remainder of the cases. Most notable improvements were seen in Kenya and Zimbabwe across multiple spells. To the contrary, there are several countries, largely in Francophone West Africa, with very high shares of women lacking schooling of six or more years; little improvement is noted over one or more spells in these countries. Within this region, Cameroon is the only country, based on the 1991 to 1998 spell, but not the 1998 to 2004 spell, where a substantial improvement is seen in the share of women who have competed six years of schooling.

When we look at the change in univariate inequality of schooling, and its overall contribution for changes based on the mean-dispersion decompositions, we find, first that in 33 of the 34 spells the overall level of education inequality declined. Like both health indicators, the mean shift is of a greater magnitude than the impact of the changes in dispersion in terms of explaining overall differences in the headcount. This is the case in 34 out of 41 spells. Overall, the average dispersion effect across all spells is 1 per cent, while the average mean shift effect is -4 per cent, indicating it is the latter which is driving improvements in the education poverty headcount. Nevertheless, the dispersion effects often prove to be quite important in explaining the overall level of improvement, or lack thereof. For example, in Uganda between 1995 and 2000, the education headcount declined from 76 to 70 per cent. The improvement in the share of women with six or more years of schooling would have been much greater, with the headcount declining from 76 to 61 per cent, were it not for the increased inequality of education during this period in Uganda. The increase in the per cent of women that completed six years of schooling in Nigeria between 1999 and 2003, similarly would have been 10 percentage points, rather than merely three, had inequality of education not negatively affected the decomposition.

As with the BMIs, the mean and dispersion effects for the years of schooling indicator tend to move in opposite directions, again, reflecting that most of the improvement in these indicators, unlike the case of child health, is in the right side of the distribution.

A final point we take up is the question of whether the spells of changes have any association with changes in several indicators of globalization. First, we look at the

relationship between our welfare indicators and various indexes of globalization. These include a simple measures of trade openness defined as imports plus exports/GDP and four indices of globalization constructed by researchers at Warwick University.[6] The first is an index of economic globalization, composed of measures of trade openness as defined above; inflows plus outflows of foreign direct investment as a proportion of GDP; and employee compensation. The second is an index of social globalization which includes foreign population as proportion of total; inflows of foreign population as proportion of total population; worker remittances as a proportion of GDP; number of tourists as proportion of total population; international outgoing telephone traffic in minutes per capita; internet users as a percentage of population; number of films, books, and newspapers imported and exported per capita; and pieces of international mail. The third index is of political globalization, which includes the number of foreign embassies in the country; the number of UN peacekeeping operations in which country participates; and the number of memberships of international organizations. Finally, there is an aggregate globalization index that combines these three components. These annual indexes are constructed to be consistent over time and across countries.

Despite the difficulties of attributing causation, we nonetheless look at simple correlations to get some insight into the relationship of our welfare indictors, both in terms of headcount ratios and Gini coefficients, and these indicators of globalization. In Table 7 we first report the results of the simple correlations for the various globalization indexes and the headcount. We present correlation results first when the headcounts and the indexes are for the same years, and also when the indexes are lagged three years for the height-for-age of children less than 36 months of age, and where the indexes are lagged 10 years for the schooling correlations.[7] While the lags are somewhat arbitrary, the logic of the use of lags for the correlation with children's growth is that height-for-age captures the accumulation of effects of economic, social and health conditions over the past few years which may be better captured by the lagged indexes. And given that the children in the sample are 0 to 36 months of age, we consider a 3-year lag to be a reasonable one to employ. In contrast for education where our headcounts are for young women aged 22-30,[8] we report the results with a 10-year lag, which generally corresponds to a period of time in terms of the indexes when most of the women would have been in their teens, an age when they would have been in secondary school if they had not dropped out early.

In the case of the height-for-age headcount, we find that there is a negative and significant correlation with our trade openness indicator and the social globalization index, both with and without lags. For the BMI headcount, we find the same result for the openness and social globalization indexes. When it comes to years of schooling, we again observe several negative and significant correlations for trade openness, economic globalization, political globalization, and political globalization with lags.

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6 For more details, see http://www2.warwick.ac.uk/fac/soc/csgr/index/

7 The results in general are not sensitive to the choice of lags. For example, if we lag education by 10 years all the significant results are the same sign and magnitude.

8 As noted earlier, we choose not to use the entire sample of women aged 15-49 because, at the younger end, we want avoid censoring for women who have not yet reached the age at which they should have completed post-secondary school and, at the older end, we want to limit our attention to those who have finished their schooling in the not-too-distant past.

In the case of the correlations with the Gini coefficients, we find that the higher the globalization indexes, the greater the health inequality in terms of both the child health and BMI indicators. More specifically, for the height-for-age headcount, the correlation is positive and significant in the cases of economic and political globalization, as well as the aggregate index. And in the case of BMI, this applies to the trade openness indicator, economic globalization, political globalization and aggregate globalization indexes.

Just the opposite finding is noted in the case in term of years of schooling where greater openness is accompanied by less inequality. This applies to the trade openness, economic globalization and political globalization indexes. Perhaps the difference with the health outcomes captures the fact that there has never been much gender discrimination in either health for kids or access to food for adults, but there has been for schooling. This, however, seems to be improving (Glick, Saha and Younger 2004), mostly at the primary level as secondary school remains rare for girls in Africa. Thus one could envisage a situation where there is both a significant reduction in education poverty (measured at primary graduation) and reduced inequality as the gender gap is closed.

Table 8 reports correlations of the changes in both globalization indexes and our non-income outcomes. The difference correlations control for country-specific characteristics that do not vary over time, including those that are difficult or impossible to measure and thus control for. If the relationship between openness and the outcomes is linear, this correlation of differences provides more reliable estimate of that relationship.

Table 7
Correlations between globalization and non-income measures of wellbeing

		HAZ		BMI		Yrs of schooling	
		Headcount	Gini	Headcount	Gini	Headcount	Gini
Trade openness	coeff	-0.2849[a]	-0.0315[b]	-0.3327[a]	0.4928	-0.3620	-0.3090
	p-value	0.0406	0.8246	0.0385	0.0014	0.0071	0.0230
Economic globalization	coeff	0.1037	0.4081	-0.2873	0.5013	-0.3554	-0.3413
	p-value	0.6143	0.0385	0.2194	0.0243	0.0634	0.0755
Economic globalization lagged	coeff	0.1363	0.4349	-0.0486	0.6898	-0.1756	-0.1442
	p-value	0.4807	0.0184	0.8256	0.0003	0.4230	0.5117
Social globalization	coeff	-0.4665	-0.0769	-0.4791	0.1309	-0.2823	-0.1281
	p-value	0.0216	0.7209	0.0326	0.5823	0.1623	0.5327
Social globalization lagged	coeff	-0.4786	-0.1333	-0.5598	0.1140	-0.2097	-0.0529
	p-value	0.0155	0.5253	0.0083	0.6227	0.5130	0.8702
Political globalization	coeff	-0.2213	0.2373	-0.0432	0.5982	-0.3890	-0.2728
	p-value	0.1394	0.1123	0.8112	0.0002	0.0063	0.0607
Political globalization lagged	coeff	-0.1183	0.2904	-0.0429	0.6852	-0.4361	-0.3344
	p-value	0.4035	0.0368	0.7954	0.0000	0.0035	0.0284
Aggregate globalization	coeff	0.0681	0.5612	0.3919	0.7016	-0.2889	-0.1307
	p-value	0.8095	0.0295	0.1854	0.0075	0.2607	0.6170

Notes: [a] Positive coefficient means that an increase in openness over time is associated with an increase in the share of stunted individuals, e.g., higher headcount.

[b] Positive coefficient implies that an increase in openness is associated with an increase in the Gini, e.g., greater inequality.

Table 8
Correlations between changes in globalization and changes in non-income measures of wellbeing

		HAZ		BMI		Yrs of schooling	
		Headcount	Gini	Headcount	Gini	Headcount	Gini
Differences in trade openness	coeff	-0.3265[a]	0.3542[b]	-0.2513	0.4519	-0.0409	0.1872
	p-value	0.0682	0.0467	0.2993	0.0521	0.8183	0.2890
Differences economic	coeff	-0.0691	0.2429	-0.0661	-0.1214	-0.3677	-0.1838
globalization	p-value	0.8225	0.4240	0.8881	0.7954	0.1776	0.5120
Differences economic	coeff	0.3939	0.4215	-0.1393	-0.2203	0.2465	0.4729
globalization lagged	p-value	0.1312	0.1039	0.7010	0.5409	0.4649	0.1418
Differences social	coeff	-0.2880	-0.0458	0.0160	-0.0752	-0.4031	-0.0274
globalization	p-value	0.3641	0.8877	0.9700	0.8595	0.1529	0.9259
Differences social	coeff	-0.1098	-0.0321	-0.1141	0.0563	-0.9668	0.7897
Globalization lagged	p-value	0.7086	0.9133	0.7536	0.8772	0.1645	0.4205
Differences political	coeff	-0.0349	0.1851	-0.3216	-0.2838	-0.1451	-0.2205
globalization	p-value	0.8656	0.3654	0.2839	0.3473	0.4613	0.2595
Differences political	coeff	0.0102	0.0188	0.0582	0.2162	0.0256	0.2904
globalization lagged	p-value	0.9557	0.9186	0.8131	0.3741	0.9076	0.1788
Differences aggregate	coeff	0.2450	0.3617	-0.2912	-0.7866	-0.5156	-0.3779
globalization	p-value	0.6399	0.4812	0.7088	0.2134	0.1909	0.3561
Differences aggregate	coeff	0.5486	0.5537	0.4977	-0.0268	na	na
globalization lagged	p-value	0.2023	0.1973	0.3955	0.9658	na	na

Notes: See Table 7.

As can be seen in Table 8, there are only three significant correlations: a positive correlation between changes in the headcount index and changes in the trade openness indicator, and two positive correlations—for the height-for-age and BMI Ginis. While these three correlations can be interpreted to suggest that an increase in globalization is accompanied by more poverty and inequality, overall, the lack of significance indicates that we do not find any relationship between changes in globalization and changes in non-income poverty headcounts or inequality.

3 Discussion

Our aim in this paper is to describe changes in non-income measures of wellbeing in Africa over the past 15-20 years, a period during which we assume that Africa has been 'globalizing'. We adopted this focus because, while there is much discussion in the literature on *income* poverty and inequality, there is very little on other dimensions of wellbeing that we feel deserve equal consideration when evaluating a country's economic and social progress. We were also encouraged by evidence from Latin America that indicates that measures of education and health have improved significantly, and their inequality has decreased in the past two decades, even as traditional income poverty has declined only a little and income inequality may well have increased (Sahn and Younger 2006).

Our hope was to find similar results for Africa where, like Latin America, income poverty and inequality are not improving. This is not an unreasonable aspiration. The underlying factors that determine income inequality are different from those that contribute to health and education inequality. For example, the nature of labour market is an important determinant of income inequality, as are the distribution of productive assets, the differential returns to human capital, and the role of non-earned incomes, including remittances from overseas workers. In contrast, education and health inequality are strongly influenced by public provision of basic services and social infrastructure. The availability and access to these institutions may have little relationship to the underlying distribution of incomes.

Progress in the provision of public services (including access to and adoption of basic health technologies such as oral rehydration) and the focus of public spending in the social sector, such as building primary schools, is expected to contribute to declining poverty and inequality in health and education, even in an environment of stagnant or worsening levels of income poverty. Investments in health and education as a share of GDP in Africa have been commensurate, and in many cases greater than other regions of the world (Table 9). Even in terms of per capita expenditures in real dollars, Africa does better than South Asia in terms of health, and East Asia and the Pacific, and South Asia in terms of education. Furthermore, there has been a push in Africa over the past decade to focus on the delivery of primary services in the social sectors. We thus expected that such policies would have reduced inequalities and lifted up those at the bottom of the distribution of wellbeing measured in terms of health and education outcomes, even in the absence of substantial improvements in incomes and income equality.

Unfortunately, our priors were wrong. In the area of health, changes in children's heights suggest that little progress is being made in terms of reducing stunting, a clear manifestation of poor overall health. Indeed, only one-third of the spells indicated improvement along these dimensions; and there were more spells indicating a worsening in the headcount ratio of stunted children. Likewise, our health inequality measure showed that while there were a few instances of reduced inequality along this dimension, there was, on balance, little evidence of success in improving equality of outcomes, despite efforts to focus expenditures and interventions on those in the bottom end of the distribution.

Our examination of underweight women as an indicator of general current health status of adults indicated that in only six of 26 spells did the share of underweight women decline. And even more disheartening, inequality in women's standardized weights actually worsened in most cases, an artifact of standardized weights increasing far more among women in the upper ranges of the BMI distribution than those in the bottom of the distribution.

With regards to education, the story is somewhat more positive: schooling poverty declined in 21 or 41 spells for which we have data, and likewise for inequality in the vast majority of cases. But even here, we had somewhat higher expectations, given all the investments and attention paid to raising primary school enrolments.

Table 9
Indicators of health and education spending by region

Region	Years	Openness	% Openness change (1995-2001)	Health (% GDP)	Health/cap (current US$)	Edu (% GNI)	Edu/cap (current US$)
East Asia & Pacific							
	1995	59.923					
	1996	55.541					
	1997	58.889					
	1998	62.506		4.411	35.653	2.284	17.042
	1999	62.378		4.553	40.466	2.265	18.205
	2000	71.598		4.914	47.824	2.313	20.064
	2001	70.102	16.987	5.068	51.757	2.309	20.821
South Asia							
	1995	27.148					
	1996	26.769					
	1997	27.185					
	1998	27.801		4.779	19.961	3.195	13.265
	1999	28.653		5.208	22.871	3.208	13.953
	2000	31.632		5.606	25.055	3.477	15.397
	2001	31.282	15.224	5.472	24.805	3.498	15.703
Latin America & Caribbean							
	1995	37.911					
	1996	39.152					
	1997	39.570					
	1998	39.701		6.931	280.352	4.04	159.513
	1999	40.378		7.119	252.071	4.074	140.345
	2000	42.066		6.906	265.859	3.977	149.966
	2001	41.460	9.360	7.046	259.49	4.096	146.982
Sub-Saharan Africa							
	1995	59.760					
	1996	59.712					
	1997	60.145					
	1998	60.336		6.49	33.847	4.944	24.58
	1999	60.540		6.593	33.581	4.893	23.616
	2000	64.828		6.279	32.228	4.85	23.14
	2001	64.912	8.621	6.326	31.467	4.605	21.27
Middle East & North Africa							
	1995	57.019					
	1996	55.028					
	1997	53.119					
	1998	52.253		5.325	69.073	5.189	84.561
	1999	52.621		5.222	68.7	5.254	84.32
	2000	55.697		5.073	71.959	5.29	90.279
	2001	54.419	-4.561	5.329	73.832	5.322	59.65

In this paper we also attempted to relate directly changes in non-income indicators of poverty and inequality to various indexes of globalization. A general story emerges that countries that are more globalized tend to show a lower rate of stunting among young children, underweight among women, and low levels of school enrolments. It is also the case that in the same countries greater globalization is associated with more inequality in terms of health, but not education. Despite that there were several strong correlations between globalization measures and health and education poverty and inequality, we would admonish against drawing the conclusion that these are causal relationships. In fact, when we control for fixed effects looking at the correlation of differences over time, almost all of the correlations become statistically insignificant. This applies to whether we look at contemporaneous changes or lag globalization indexes relative to the various outcomes analysed. There is just nothing here to suggest that globalization is correlated (positively or negatively) with health and education outcomes. While these results may be viewed as somewhat disappointing, they likely reflect the complexity and context specific nature of the dynamic processes that both contribute to changes in the globalization indexes employed, and how they transmit through very different economic and social structures to affect non-income poverty.

Finally, we acknowledge that we are not capturing all non-income dimensions of wellbeing, broadly speaking, nor even all dimensions of health and education poverty and inequality. For those dimensions other than child stunting, mother's BMI and years of schooling, the story of limited progress in eliminating health and education poverty and inequality may not hold, although, we suspect it does. Nonetheless, we need to be cognizant of this possibility and appropriately cautious in generalizing from the limited dimensions over which we conduct our analysis. This implies a need to further consider other indicators of wellbeing. But more important is to gain a fuller understanding of the processes that contribute to differences in income versus other indicators of inequity and poverty, as well as explaining the relatively discouraging outcomes presented in this paper. This is best done through intensive country studies, rather than painting with a broad brush as we have done in this paper. However, the bottom line seems clear: the evolution of income inequality and poverty in Africa during the 1990s and first part of the new millennium gives little cause for complacency or optimism.

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