STRUCTURAL ADJUSTMENT, POVERTY AND INCOME INEQUALITIES

“... Half a world away [from Zambia] in Washington, the architects of this human disaster dine in comfort and seclusion, spending more on one meal than Masaso Phiri’s wife makes in a year of selling buns in their shantytown.

Although most World Bank staff work at its Washington headquarters, those unlucky enough to be posted in the Third World receive ample compensation for their misfortune ... No "structural adjustment," then, for this privileged coterie of bankers and policy analysts. Meanwhile, in Africa a hidden genocide lays waste the continent.” "It’s not right for a bank to run the whole world,” says Fred M’membe, editor of the Zambia Post. "They do not represent anybody other than the countries that control them ... Look at any African country today, and you’ll find that the figures are swinging down. Education standards are going down, health standards going down and infrastructure is literally breaking up.”” . Mark Lynam, 2001

Poverty and income inequalities have been the strongest concern since the inception of structural adjustment policies in the early 1980s. Initially, two distinct views were existing about the distributional effects of the adjustment policies in developing countries. The first has been backed up by the IMF and the World Bank and claims that the poor will benefit of these policies, however, after a transitional period of economic stress. The second has been voiced by several international organizations and national governments and argues that the poor are especially hard hit by these policies. Recently, distributional implications of the adjustment policies have come under fire for their impact on poverty and income inequalities.
Establishing that structural adjustment policies have resulted into deterioration in health indices through the poverty and income inequality domain requires three logical conditions. First, it must be statistically proven that adjusting countries have witnessed an increasing rates of absolute poverty and a widening gap of income inequalities that are significantly higher than non-adjusting countries. Second, these should be attributed to structural adjustment policies in a manner that satisfies the scientific criteria for causation. Third, it must be established that the magnitude of poverty caused by structural adjustment is enough to cause a reversal in the health situation of the adjusting countries. The following chapter deals with these three conditions and organized therefore in three sections. The first reviews the available evidence on the relation between poverty and health. The second presents the current situation and the trends of poverty and income inequality from a global and regional perspectives. The third discusses the suggested causal relationship between structural adjustment and income inequality.

**Poverty, income inequality and health**

The empirical literature on the relationship between income inequality and health has grown very rapidly over the last decade. The intention of this review is not to be exhaustive but rather to highlight the trends that have occurred and the insights that have emerged from empirical tests of the above hypotheses. Two trends seem to stand out: (a) a shift in emphasis from aggregate-level studies to analyses of individual-level data and (b) a shift from mortality-based health measures to measures of (self-reported) morbidity. In this section, studies were subdivided by their levels of aggregation, that is, population, community, or individual level. Some of the more recent studies, which have looked at various levels of aggregation simultaneously, have been included in the section on individual-level studies.

Furthermore, the review relates the empirical studies to five basic theories of the relationship between poverty and health. These are the Absolute Income Hypothesis (AIH), the Relative Income Theory (RIT), the Deprivation Hypothesis (DH), the Relative Position Hypothesis (RPH), and the Income Inequality Hypothesis (IIH).

The AIH argues that that the association between poverty and health indicators reflects the influence of an individual's absolute level of income on his or her health. This was pointed out long ago by Preston (1975) and Rodgers (1979) and recently reemphasized by Gravelle (1998). The key point in Rodgers' argument is that the relationship between health and income is concave - each additional dollar of income raises a person's health, but by ever smaller amounts. According to the AIH theory the health of both a community and a population depends not only on the average income, but also on the inequality in income within the community or population. The intuition is straightforward. Each additional dollar of income at the individual level raises individual health by ever smaller amounts. Starting from an
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equal distribution, taking $100 away from person A and giving it to person B reduces A's health and raises B's, but, because of the diminishing returns to income in the production of health, A's health falls by more than B's rises. The average income of this two-person population has not, of course, changed. Thus, average health in the society will improve as the average income increases and the inequality of income decreases.

An alternative hypothesis is the relative-income hypothesis (RIH), which indicates that an individual's relative - rather than absolute - income affects his or her health. Thus Wilkinson (1998) writes, "... poor people in the United States often have death rates comparable with people in Bangladesh. Their high death rates are not so much a product of their absolute living standards but reflect their low relative incomes and social status. ... Mortality is associated with relative income. ... Someone with an absolute income that equals half the US average income might do better to be moderately well off in Greece or Spain than poor in the US" (Wilkinson, 1998).

A second alternative theory is the deprivation hypothesis (DH), which suggests that it is not absolute income that matters for individual health but rather the extent of deprivation as measured by the income gap. The Relative Position Hypothesis (RPH) holds that it is not just income that matters, but also one's position in the income distribution. Thus, Wilkinson (1996) suggests that "... what matters within societies is not so much the direct effects of absolute material living standards so much as the effects of social relativities. Health is powerfully affected by social position. ..." (Wilkinson, 1996).

The final hypothesis worth considering is that an individual's health is directly affected by income inequality [the income-inequality hypothesis (IHH)]. Thus Wilkinson (1998) argues that "health is powerfully affected by ... the scale of social and economic differences among the population" (Wilkinson, 1998). He goes on to suggest that it is not inequality per se that matters, but rather that what makes egalitarian societies healthy is their degree of social cohesion or "social capital."

Population-Level Studies

A large number of cross-national comparative studies have now shown that the relationship between income and mortality-based indicators of population health is nonlinear at the aggregate level [see e.g. Pritchett & Summers (1997) and Kakwani (1993)]. Insofar as these results reflect nonlinearity at the individual level, they are consistent with the AIH, but are also consistent with the various alternative hypotheses. Also consistent with the AIH and the other hypotheses are the numerous population-level associations between health and income inequality. Rodgers (1979) was the first to draw attention to the strikingly consistent relationship between three mortality-based population health measures (life expectancy at birth, life expectancy at fifth birthday, and infant mortality) and...
income inequality, as measured by the Gini coefficient. These results were observed in a sample of 56 countries, while controlling for income by using a regression model that allowed income to influence health in a nonlinear fashion. The results held true both for all countries and for the sub-sample of less-developed countries, as confirmed by Flegg [1982], who used various measures of income inequality while controlling for income, illiteracy, and medical-care availability. Waldmann [1992], using a slightly different approach, also showed that income inequality mattered; he found that, while controlling for the real income levels of the poor, indicators of the amount of health care available to the poor, and some other variables, a greater share of income going to the rich is correlated with higher infant mortality. In several papers, Wilkinson, either alone or with coauthors, has reported associations between population health outcomes and income inequality, in some cases controlling for income levels and other influences (McIsaac and Wilkinson, 1997; Wilkinson, 1992a; Wilkinson, 1992b). Wilkinson and various others have also reported correlations between income inequality and measures of social cohesion or social capital. Coupling these two sets of correlations (income inequality to population health and income inequality to social cohesion or capital), they infer that income inequality influences health via its effect on social cohesion. In various places, Wilkinson (1996 and 1997) has argued that, although the associations noted above may not be compelling in isolation, they are compelling when coupled with other evidence. Specifically, he has noted that the correlation between population health measures and average income is low compared with (a) the correlation between population health measures and income inequality and (b) the correlation between individual health and individual income (or social status). These two comparisons have led him to conclude that it is not the AIH that accounts for the association but something else. Commenting on point b above, he argues that "... if health is related to differences in living standards within societies, but not to differences between them, we surely have to conclude that these differences mean something quite different within and between societies" (Wilkinson, 1996). As it happens, both of these findings are, in fact, perfectly consistent with the belief that individual health is determined along the lines of the AIH. It is easy to produce a numerical example in which the health status of individuals in different countries is constructed as a nonlinear function of income and to show that this is sufficient to generate the correlation patterns noted by Wilkinson.

It was suggested that it may be possible to shed some light by using population-level data on the validity of the deprivation hypothesis. In practice, however, there is relatively little evidence that we can bring to bear on the subject. Wilkinson (1992a) has reported a high correlation between the annual rate of change in life expectancy and the annual rate of change in the proportion of people living in relative poverty (i.e. <50% of the national average disposable income) in 12 European Community countries for the period 1975-1985. Anand & Ravallion (1993), for a sample of 22 developing countries, showed that the effect of average income became insignificant
after inclusion of a poverty measure (the proportion of the population consuming <$1.00/day), which did have a significant impact on their population health measures, along with public health spending. Similarly, Carrin & Polti (1995), using an expanded data set for 1990 for 57 countries, found confirmation of this significant effect of the poverty headcount ratio. But neither of these two studies adjusted for two other important variables, namely the income level of the poor and the degree of income inequality among the poor. The study by Bidani & Ravallion (1997)—although designed with a different purpose in mind—is of interest, because it includes, in addition to a headcount, the average income of the poor, although not a measure of inequality among the poor. For a sample of developing countries, Bidani & Ravallion regressed life expectancy and infant and perinatal mortality on, inter alia, the proportion of the population in poverty and the average incomes of the poor and nonpoor (weighted by the proportions affected). They found that the poverty headcount has a significant effect on life expectancy and infant and perinatal mortality, but the average income among the poor (and that among the non-poor) does not. The evidence on the DH is clearly far from conclusive. The limited evidence that does exist, however, suggests that deprivation may, at least in developing countries, play a part in shaping health outcomes. It is striking that, in contrast to what one would expect if absolute income were the whole story, poverty headcounts do seem to matter—more so, apparently, in some cases than absolute incomes.

Community-Level Studies

A second phase in the literature investigating the income inequality-health relationship is characterized by studies focusing on the within-country association at various levels of regional aggregation. Basically, all of these studies test whether, at some regional level, income inequality, measured in very different ways, exerts an influence on mortality after controlling for income level. Virtually all studies conclude that this is the case. The variations across studies lie in (a) the level of regional aggregation, (b) the measure(s) of mortality used, (c) the measure(s) of income inequality used, and (d) what, if anything, is controlled for when examining these relationships. Several studies have examined the variation across 50 US states (Kaplan et al, 1996; Kawachi and Kennedy, 1997; Kennedy et al, 1996), one has looked at the variation across 283 US metropolitan areas (Lynch et al, 1998), and one has considered the variation across 369 local authorities in England (Ben-Shlomo et al, 1996). The latter study is somewhat different from the others in that it measured within-community income variation not by inter-individual income variation but by inter-ward variation in some deprivation index.

The first point to emerge from these studies is that they all confirm that income inequality is strongly associated with mortality, even after controlling for the average level of community income. Kaplan et al (1996) found a significant correlation
between the percentage of total household income received by the less well-off 50% in each state and mortality from all causes, which was unaffected by adjustment for state median incomes. Moreover, states with higher initial income inequality (in 1980) had smaller declines in mortality by 1990, but the changes in income inequality between 1980 and 1990 themselves were not significantly associated with the mortality changes by state. Kennedy et al (1996) found a strong association of income inequality on all-cause and cause-specific mortality by state. Kawachi & Kennedy (1997) later examined the sensitivity of the association to six different income inequality measures and found that they were all strongly correlated with each other and with overall mortality, even after adjustment for median income.

The second notable point is that some of these studies also shed some light— albeit only indirectly— on the plausibility of the DH, because they included a poverty measure among the covariates. Unfortunately, none of these studies report the partial effect of poverty. They report only the high bivariate correlations (positively with income inequality and negatively with income) and examine the influence of its inclusion among the covariates. Kawachi & Kennedy (1997) find that the association between nine different measures of income mortality remained highly significant after adjustment for poverty, despite the fact that the poverty rate and all of these inequality measures are highly correlated. Lynch et al (1998) examined essentially the same relationships but for 283 US metropolitan areas, using seven different income inequality measures. They controlled for per-capita income, median household size, and the proportion of the population with incomes <200% of the federal poverty level. Regardless of which measure was used and the type of covariate that was included in the regression models, income inequality was significantly associated with age-adjusted total mortality. The fact that income inequality remains significant when poverty is included clearly casts doubt on the hypothesis that it is solely the extent of deprivation that matters. If, on the other hand, the poverty rate shows an independently significant effect on mortality over and above income inequality, this is consistent with the DH, but a fuller test of its implication would require the inclusion of the other measures in Equation 8. None of the studies to date has done so.

A third point is that Lynch et al (1998) also report that higher per-capita income was still significantly associated with lower mortality, but that this association was weaker than the effects of income inequality. As we argued in the previous subsection, this is perfectly consistent with the AIH hypothesis.

Fourth, several studies have examined potential pathways and mechanisms that may be mediating the association between income inequality and health, probably with some variant of the IIH in mind. Kawachi et al (1997) examine the possibility that the degree of income inequality is related to indicators of (dis)investment in social capital like per-capita group membership and lack of social mistrust. They measure social capital by weighted responses to two items from the General Social Survey:
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per-capita density of membership in voluntary groups in each state and the proportion of residents in each state who believe that people can be trusted. After they controlled in their path analysis for disinvestment in social capital, they found little residual association between income inequality and mortality, suggesting that the primary effect of income inequality on mortality is mediated by social capital. Such evidence is clearly inconsistent with the AIH. If the non-linear relationship between health and income at the individual level is generating the effect of income inequality at the community level, then controlling for community-level social capital levels should not remove this effect.

Finally, none of the community-level studies has, to our knowledge, attempted to address the relative position hypothesis, that the relative rank of the community within a country has an effect on mortality. It is therefore not possible to conclude anything about the RPH.

Individual-Level Studies

Individual-level studies focus on the health of the individual rather than that of a community or population. These studies were suggested to have two basic advantages in asserting the relationship between poverty and health. First, they can cleanly discriminate between the various hypotheses. Second, they are generally more adequate than most of the studies done at higher levels of aggregation— they rely not on simple correlations but on regression analyses in which the confounding effects of influences other than income can be controlled.

Only four studies explicitly provide a proper test of the AIH, by allowing individual income to influence individual health in a non-linear fashion. Mellor & Milyo (1999) include income and income squared and find clear evidence of a concave relationship for self-reported health, whereas Wolfson et al (1999) find a convex relationship for mortality risk. Kennedy et al (1998) report odds ratios for six income categories, and Soobader & LeClere (1999) do so for four income quartiles. Although the unequal income widths of these classes make the exact income-health relationship more difficult to assess, in both cases the increase in odds ratios increases with decreasing income. Fiscella & Franks (1997) allow only for linear income effects, whereas Daly et al (1998) do not report the estimates of their income effects. In all cases, the strong positive (but decreasing with rising income) effects are overwhelmingly consistent with the AIH. This is scarcely surprising given the multitude of other studies— including several published recently— that suggest a concave relationship at the individual level between health and income. [Two recent examples showing the concave relationship between income and self-perceived health include work by Ettner (1996) for US data and by Ecob & Smith (1999) for UK data. Others have found similarly that the mortality reduction resulting from increased income diminishes as income increases (Backlund et al, 1996; McDonough et al, 1997).] In contrast to all other studies, Wolfson et al (1999) do
not aim at estimating the effect of income inequality on individual mortality risk while controlling for potential confounders. Instead they use the estimated convex relation between individual income and mortality risk to generate the state-level mortality rates that would have been generated if this were the only reason for state mortality differences. In this way, they show that the AIH can account for only a minor part of the actually observed state level association between income inequality and mortality.

Four studies include average community income in their regressions and hence provide—at least in principle—evidence on the RIH. In practice, however, the evidence is more limited, because only two (Mellor and Milyo J, 1999; Soobader and LeClere, 1999) report the regression coefficients on community income. If the RIH is true, holding individual income constant, community income should be inversely related to health; rises in everyone else’s income without any change in one’s own are bad for one’s health. In this event, both studies report a positive relationship between individual health and average community income, although in most cases this is not significant when other variables are included in the equation. There is absolutely no evidence whatsoever; therefore, in these studies to support the RIH—if anything, the evidence that exists actually contradicts the RIH.

Most studies shed light on the IIH. The evidence here is mixed. Two of the mortality-based studies find no general evidence to support the IIH (Daly et al, 1998; Fiscella and Franks, 1997) and the third (Wolfson et al, 1999) does not test it directly. This is somewhat surprising given the emphasis on mortality in the studies at community and population levels. The lack of any effects in the study by Fiscella & Franks (1996) may be due to weaknesses in the study design: individual income is entered linearly even though the AIH predicts a concave relationship; the county-level income inequality data are estimated from the sample rather than taken from the census estimates and are hence subject to small numbers and imprecise estimation problems; the authors examine inequality effects only at one level (the county); the study makes only a limited attempt to control for other observed influences on health and is unable, given the data, to control for unobserved fixed effects; finally, the study reports no subgroup analyses (e.g. by the income level of the individual). The design of the study by Daly et al (1998) is somewhat better; it too enters individual income linearly; the income inequality data, however, are taken from the census; this study also examines income inequality effects at just one level (this time the state); the study is marginally more successful in controlling for other influences on health; and some subgroup analyses are undertaken. Despite the differences, neither study finds any general effect of income inequality on individual health.

The three studies with self-assessed health appear, on the face of it, to give rather different results from one another, with one finding effects of income inequality on individual health among the general population (Kennedy et al, 1996), another
finding some effects on white working-age males (Soobader and LeClere, 1999), and a third finding no general effects (Mellor and Milyo, 1999). These differences are probably due to the fact that the model estimated by Mellor & Milyo includes fixed state and year effects. In their study, they thus control for variables that cannot easily be observed but vary across states or over time. The inclusion of these fixed effects, along with household income, produces a dramatic fall in both the estimated regression coefficient of income inequality and its significance. By contrast, the inclusion of individual covariates other than household income—given the presence of the state and year fixed effects—has very little effect on the effect of income inequality. The implication is that, in the studies of Kennedy et al (1998) and Soobader & LeClere (1999), income inequality is probably capturing, at least in part, other state characteristics.

Interestingly, although Mellor & Milyo find no general evidence of an effect of income inequality on individual health when household income is controlled for, some of their results are not that far from those reported by Kennedy et al (1998) and Soobader & LeClere. Furthermore, although the authors of the latter two studies claim to find general evidence in support of the IIH, it would be more accurate to say they find mixed evidence.

The study by Kennedy et al (1998) finds an effect of income inequality at the state level on individual health. But in sub-sample analysis, they find that the effects of income inequality depend on income level: among the richest sub-sample, there are no significant health effects; among the middle-income group, it is only when the Gini rises $>0.332$ that any significant effect appears; among the poorest income group, there are large and significant effects of income inequality on health, and the effect is larger the higher the level of income inequality. It was suggested that the evidence from the study by Kennedy et al is mixed—there is strong evidence that income inequality at the state level is inversely associated with an individual’s health; but the further one goes up the income distribution, the less evidence there is; at the top, there is no evidence at all. A not dissimilar picture emerges in the study by Mellor & Milyo (1999). In contrast to Kennedy et al, they find, as indicated above, no evidence in support of the IIH for the population as a whole. They do find some—albeit rather fragile—evidence, however, of an effect of state level income inequality on the health of those living below the federal poverty line. In this sense, the results of these two studies are thus not that far apart.

Furthermore, the results of Mellor & Milyo (1999) are not completely at odds with those of Soobader & LeClere (1999). They compare the sensitivity of the estimated health effects of income inequality to the level at which income inequality is measured. As indicated above, they find some evidence of state-level income inequality having a significant effect on the health of those living below the federal poverty line. However, they fail to find any significant effects when income inequality is measured at any other level. The relative magnitudes of the various
income inequality effects also vary. Inequality at the census region level has only one half of the effect of inequality at the state level. What is more surprising is that inequality at the metropolitan area level has only 20% of the effect of inequality at the state level, whereas inequality at the county level has only 10% of the effect of state level inequality. These results are more extreme than—but are not dissimilar to—those reported by Soobader & LeClere, who find that income inequality has a larger impact on individual health when measured at the county level than when measured at the lower census tract level. These results are thus consistent with the Mellor & Milyo (1999) result that income inequality has the greatest effect when measured at the state level.

As far as the self-assessed health studies of the I1H are concerned, therefore, we have three findings. First, the estimated effects of income inequality are highly sensitive to the inclusion of fixed state and year effects that take into account unmeasured differences between states and years in variables that affect individual health. When these are taken into account, income inequality does not appear to have any effect on individual health. Second, there does appear to be some evidence to suggest that income inequality adversely affects the health of the poor. Third, it appears to be state-level income inequality that has the effect on health rather than income inequality at any other level. This last finding is, as Mellor & Milyo point out, rather odd—it seems more plausible that, if income inequality is capturing the effects of social capital and the adverse effects of social division associated with income inequality, the effect of measured income inequality ought to be stronger when measured closer to home than when measured at a level involving as many people as a state. The stronger effect of state-level inequality, coupled with the stronger effect among the poor, raises the question, as Mellor & Milyo (1999) note, whether income inequality in these studies is perhaps not capturing social capital or psychosocial factors at all, but rather the effects of public policies toward the poor, for example, in welfare and Medicaid. Given where different policy decisions are taken in the United States, it seems more likely that the geographical unit across which variations in such policies are observed is the state rather than the census region or the metropolitan area (both of which are statistical constructs) or the county (which has a very limited role in shaping welfare policies). Furthermore, the policies that states adopt may well be correlated with their income inequality. If this is the case, the results reported in the Mellor & Milyo study for one of their income inequality measures, as well as those reported in the studies by Kennedy et al (1998) and Soobader & LeClere (1999), could quite simply be due to the effects not of state-level income inequality on the health of the poor, but rather the effects of state-level public policies towards the poor on the health of the poor.

CONCLUSIONS

This review began with the observation that, at the population level, health and income inequality are often found to be inversely related. It then spelled out a
number of hypotheses that have been advanced to explain this association and went on to argue that empirical studies at both the community and population levels—however carefully executed—cannot appropriately discriminate between them. It seems that one cannot, for example, despite what has been written and despite the sheer volume of them, conclude very much about the effects of income inequality on individual health from population-level studies. What seems to be required to discriminate between the various hypotheses are individual-level studies, because it is only at this level of aggregation that one can observe relationships that are consistent with one hypothesis and not with another.

The following conclusions can be drawn from this review. Extensive evidence strongly supports the AIH—the notion that individual health is a concave function of individual income. By contrast, no evidence whatsoever is consistent with the RIH—the notion that, holding constant one's own income, one's own health is a decreasing function of everyone else's income. Some evidence is consistent with the IIH—the notion that an individual's health is a decreasing function of income inequality in his or her area, but that the strength of the effect depends crucially on how well one controls for other influences on health, especially the individual's income and those that are hard to measure but vary systematically from state to state and from one year to the next. When such influences are controlled for by use of fixed-effect methods, the evidence at the population level appears to disappear. Some weak evidence remains, however, for the poorest section of the population, but only for income inequality measured at the state level—the effects at lower and higher levels are much smaller and are not statistically significant. This suggests that income inequality may not be capturing the hypothesised effects of social capital or psychosocial factors but rather the effects of state-level policies toward the poor that are correlated with income inequality.

In terms of what the literature to date tells us, then, we thus reach two rather negative conclusions. First, a large number of studies have been undertaken that, by their very nature, appear to be incapable of shedding any light on the effects of relative income and income inequality on individual health. This has been argued by other commentators and now seems accepted by most—but not apparently all—researchers in the field. Our second conclusion, which is new, is that the evidence emerging from the studies that can, in principle, shed light on these effects is rather negative—there is strong support for the AIH, no evidence for the RIH, no evidence for the RPH (because it has not been tested), and evidence relating to the IIH that suggests that, in the relatively few cases where income inequality appears to be associated with health at the individual level, this hypothesis may well not be picking up the psychosocial effects associated with social capital and social cohesion. This is not to say that this is definitely the case—rather that the evidence is far from compelling.
Global Trends of income inequalities

Discerning the trends of poverty and inequality in developing countries is generally difficult because valid and reliable data on the main indicators are lacking. This is particularly true for the poorest countries, especially those in Sub-Saharan Africa.

Nevertheless, a considerable body of scientific literature concludes that that income inequality has been increasing in the majority of developing countries over the last twenty years, although the evidence is limited and clear trends can be hard to discern. In general for many countries there appears to be a U-shaped trend over the last 30-40 years, with inequality tending to fall up through the late 1970s or early 1980s, and then rising since the late 1980s. Thus findings of overall trends depend heavily on the starting and ending year used; those authors who do find a rising trend tend to focus on the last 10-15 years.

Using regression model for a global database, Li et al (1998) found no trend in inequality in two-thirds of their sample. Cornia (1999) re-estimated their equations, using a non-linear functional form, adding in the transition countries, and extending the time period. Out of 77 countries inequality was found to be increasing in 45, declining in 16, and unchanged in 16. In the majority of countries in which inequality was rising, this was a rebound from declining inequality, i.e a U-shaped pattern.

Of significance is the observation that over two-thirds of these reversals (32) came after 1980; roughly the period when the structural adjustment policies were introduced in many countries. Galbraith et al., (1998), indicated that the predominant recent trend in inequality [since the 1980s] has been decisively upwards. They also remarked that for many countries overall trends conceal
important short-term swings in inequality, these swings most pronounced for countries whose integration into the world economy had increased.

An empirical analysis by Kohl and O’Rourke (2000) suggested that there has been an increase in inequality, although the evidence is weak. They compared the first halves of the 1970s and 1980s and found no trend; inequality increased and decreased in about half the countries in the sample. For the following decade, increases dominated decreases by a 2:1 margin. There were only enough developing countries for which there was high quality data for results to be suggestive: between the 1980s and 1990s inequality increased in 13 countries and decreased in 8 countries.

A number of studies have looked at changes in inequality by region and provided almost identical results (Melchior et al, 2000; Cornia, 1999; Galbraith et al, 1998). Inequality in East Asia was stable or declined in most countries in the 1970s and 1980s, followed by a general tendency towards increasing inequality in the 1990s, both in the Newly Independent States and South East Asia; in Thailand inequality appears to have increased steadily. There is universal agreement that inequality has risen in the transition countries of Eastern Europe and the former Soviet Union since 1987, particularly in the latter countries and south-eastern Europe, and accelerated in the 1990s.

In South Asia the picture is mixed; with unweighted inequality rising slightly though the early 1990s inequality in India and Pakistan was relatively stable. The overall trend in Sub-Saharan Africa resembles that of East Asia, stable or declining in the 1980s and then rising in the 1990s, with some variation across individual countries.

Latin America is the most inequitable region worldwide, where no one single country reaches even the median level of the Gini of Sub-Saharan Africa. A recent study revealed that Latin America’s high average inequality is not due to one or two outlying countries. The majority of Latin American countries have Gini’s over 0.50. This was indicated to be higher than the maximum Gini in all but 14 of the 88 non-Latin American countries, to which data were available. (Deininger & Squire, 1996).

The region-wide averages indicate that little change in the extent of inequalities has occurred since the 1980. Throughout the 1980s inequality rose in eight countries and fell in eight and was constant in one. However, the changes were generally small and exceeded 5 percent in only four countries. Data inconsistencies were suggested to affect the magnitude of change in these four cases and it was therefore suggested that inequality moved within a fairly narrow range for most countries in the region.

By looking at individual countries instead of the regional averages, important observations were made. For example, in six countries inequality has risen sharply in the past and seems now to be stuck at a very high level. These countries are Brazil,
Chile, Colombia, Ecuador, Nicaragua, Mexico and Panama. Another two countries, Argentina and Venezuela, had fairly moderate levels of inequality at one time but have suffered a significant increase in the 1990s. In another three countries, Honduras, Peru and El Salvador, there was some progress between 1990 and 1995, but most or all of that has been reversed after 1995. Finally there are two countries—Bolivia and Ecuador for which national data are only recently becoming available. They are problems too because all of them have very high levels of inequality at the end of the decade.

On the other hand, Costa Rica and Uruguay managed to make some successes in reducing inequalities to levels found in developing countries. However, further reductions were suggested to be unlikely in these two countries, since these levels were believed to be the lower limits to income inequality in both countries.

Finally there are three countries, the Dominican Republic, Jamaica and Paraguay in which there was a decline in inequality. However the decline in Jamaica and Paraguay was the result of a severe and lengthy recession in which the rich lost more than the poor whose expenditures or income did not change much because they were living close to subsistence in the first place.

A conclusion was drawn that income inequalities in Latin America is serious and detrimental. There are only three countries with either low or declining levels of inequality and an adequate growth rate. All the other fourteen countries have serious problems. Either their inequality is stuck at a high level, has been rising significantly in recent years or they are in serious recessions. Unfortunately this problem group includes more than 90% of the population of the region. And what is worse, there are few if any signs of improvement in the situation. That is the reality and the core of the distribution problem in Latin America.

Over the last two decades, African poverty has increased markedly. It was estimated that since the late 1980s, the poor in Sub-Saharan Africa, defined as those living on less than US$1 per day, increased by 70 million to a total of 290 million in 1998, that is over 46 per cent of total population. It is significant that in just over a decade, in which structural adjustment policies were introduced, Africa’s share of the world’s poor rose from just below 20 per cent to close to a quarter.

A recent study assessed patterns and trends of income inequalities in four African countries, Côte d’Ivoire, Kenya, Nigeria and Uganda. Analysis provided interesting results, which are peculiar to each country. Côte d’Ivoire provided an interesting example, which enjoyed unprecedented growth (7 per cent per year) in the post-independence era. However, income inequalities increased sharply with the economic growth. In the first decade of independence, Côte d’Ivoire’s Gini rose from 0.46 to 0.53, an increase of 15 per cent.
This paradoxical trend was attributed to rapid migration from neighboring poorly performing countries and to the presence of a large number of highly paid French expatriates. Inequality was to rise even faster during the 1970s, following the extraordinary increase in cocoa and coffee prices during 1976-77. The Gini for 1979 was measured at 0.61. Ironically, inequality in Côte d'Ivoire did not begin to fall until the crisis sets in the early 1980s. By 1985 the Gini had fallen to 0.39. This was a direct reflection to the reduction of migration rates and the departure of French expatriates since the economic climate had become less attractive.

With respect to the impact of economic reforms on poverty, the interesting period in Côte d'Ivoire is that which followed the devaluation of the CFA franc in 1994. Comparing the years 1993 (before devaluation) and 1995 (after), poverty in Abidjan, the capital, rose fourfold, from 5 to 20 per cent of the population, with the devaluation reducing the value of incomes in foreign currency terms (wages and profits) by half. In the countryside, it is notable that poverty rose by 40 per cent in West Forest, a key coffee and cocoa-producing region that would have benefited directly from the devaluation, illustrating the gap between theory and the reality on the ground. Part of the reason for the decline is that West Forest depends on migrant labor for production and the bulk of them had returned home when their real wages were halved by the devaluation.

Kenya, a second interesting example, had a Gini of 0.52 in 1976, although the country enjoyed exceptionally high growth rates in the 1960s and 70s. In the 1980s, the country went into steep economic decline and embarked on a string of adjustment programs, which were often abandoned halfway through. At the beginning of the 1990s, donors imposed an aid embargo on the country. However, the Gini coefficient for 1994 was 0.575, an increase over the 1976 figure of 10 per cent. In light of the turbulent changes in the economy over the 18-year period the increase in inequality looks modest. This is probably explained by the fact that land ownership patterns had not changed too drastically in the countryside, while urban incomes had generally declined.

Nigeria, an oil exporting country, witnessed increasing income inequalities despite the huge oil incomes following the booms in the 1970s and 1980s. This is clear from the trend of the Gini in Nigeria, which was 0.37 in 1985, rising to 0.416 by 1992, an increase of 12 per cent. Likewise, poverty in Nigeria increased by 53 per cent between 1992 and 1996. However, that in urban areas grew by 94 percent, from 29.6 per cent to 57.5, while rural poverty grew by 50 per cent.

Uganda provides an interesting case of an African country that has returned from the verge of economic disaster to sustained growth. Before the military took power in Uganda at the beginning of the 1970s, the Gini for 1970 was 0.266. This was low in comparison to many other African countries at the time. It was a good reflection of the economy, the bulk of which depended on peasant farmers some wholly
dependent on subsistence, while others grew cash crops. No survey was undertaken during the long period of chaos, which lasted for close to two decades up to the mid-1980s. The Gini for 1989 is 0.33, a twenty percent increase over the figure for 1970. However, considering the amount of chaos that the country went through in the interim, it still seems modest. The relatively small change could be explained by the fact that, as in Kenya, the main assets of the poor in the countryside continue to be land and own labor, still directed at subsistence activities.

Uganda has embarked on the structural adjustment programs since 1987. A key goal of the program was to increase incentives for production in the economy. Coffee was especially targeted, with its marketing de-monopolized and taxes removed. Moreover, wages for civil servants were improved. The economic reforms increased coffee and food production in the southern parts of the country, raising incomes. Starting from a low base, all these factors contributed in concentrating incomes around Kampala, other urban centers and areas in their proximity. In Uganda’s case, structural adjustment seems to have increased overall inequality by very little if at all. The Ginis for 1992 and 1996 are both at around 0.38. That there is little change in inequality, on average, is significant since insecurity and political destabilisation have been serious problems in the north and west of Uganda. Many peasant households have been displaced and, though their areas are suitable for growing crops for export, they have not been able to do so. But it also implies that inequality fell in the more peaceful areas of the country, notably the coffee growing regions.

With regard to poverty, Uganda saw it fall by 18 per cent between 1992 and 1996, with significant declines in both urban and rural poverty. It is estimated, however, that only 13 percent of the decline in poverty is a result of changes in income distribution, while the rest was ascribable to growth in average incomes. The reduction in poverty is closely linked to higher incomes for coffee farmers, removal of export taxes and related exchange rate reforms. However, even in Uganda’s apparently successful case, there have been significant sector and regional variations. Food producers fared less well while in the north and east, which have been politically destabilized, poverty, which is already very high there, fell by much less during the period of reform.

East Asia has experienced the most rapid decline in poverty compared with other regions. Over the 1975-95 period poverty fell by two thirds, with simultaneous improvement in several other social indicators such as life expectancy, infant mortality and access to education. However, the decline in absolute poverty has not always been accompanied by improvements in equity. Based on average Gini coefficients, income/expenditure distribution in East Asia has remained unchanged in the last fifteen years and the distribution is shown to be more equal compared to Latin America. However, there are different trends between East Asian countries.
In Southeast Asia (except for Thailand), inequality of distribution has remained relatively unchanged or was falling up to the early 1990s, and then rose in the latter part of the 1990s. In contrast Thailand exhibited the opposite trend. Inequality has risen consistently in China since the 1970s and only begun to decline slightly in 1998. Inequality in Korea seems to have been improving up to 1993, although recent data to reflect the boom years are not available. The average inequality trends also mask inequalities based on other dimensions such as ethnic, regional, urban-rural and gender, which especially since the crisis have risen to prominence and are one source of increasing tension in some of these countries (bin Yusoff et al, 2000; Feridhanusetyawan, 2000; Phongpaichit and Santisart, 2000; World Bank, 2000b).

During the 1970s and into the 1980s, East Asia countries, with few exceptions, experienced relatively high average growth rates at above five percent consistently. The initial impact on poverty was dramatic, with all the economies, except the Philippines, experiencing a rapid decline in poverty in the first half of 1970s. Malaysia and Indonesia also experienced an initial increase in inequality of distribution. Even though the Philippines experienced growth of around 6 percent for most of the 1970s based on an import substitution industrialization policy, there was little change in the incidence of poverty and inequality of distribution in the 1970s.

However, from mid 1970 until mid 1980s, the pattern diverged. Indonesia and Malaysia continued to experience decline in poverty levels. Whereas in the case of Thailand, poverty incidence declined from the mid-1970s to 1981, but rose again in mid 1980s. The fluctuations in poverty incidence have been mainly due to fluctuations in agriculture commodity prices.

As for the pattern of inequity, the Gini coefficient declined consistently for Malaysia and Indonesia throughout the period. Inequity in Thailand rose for the entire period, as a result of widening differential between rural and urban households. Meanwhile, the Philippines experienced little change in poverty incidence or distribution so that poverty incidence remained double of the other Southeast Asian economies in 1985.

The situation in Southeast Asia provides a mixed picture in terms of the pattern of growth, poverty and inequity. Indonesia and Malaysia provides the more typical picture of inequality first increasing then decreasing with economic development. Whereas, Thailand provides the opposite picture with the rise in inequality for most of the period. Growth has led to these outcomes, but decline in income inequality led also to more positive growth in the case of Malaysia and Indonesia. Growth was the predominant factor in reducing poverty, but reduction in inequality also assisted poverty incidence in the case of Malaysia for the whole period and for Indonesia in the later period of 1978-84.
In the period from mid 1980s to 1990s, all the Southeast Asian economies pursued a more aggressive and consistent export oriented strategy and were already or shifting away from labor intensive exports to more skilled labor and human capital intensive exports. At the same time these economies had liberalized the financial sector and/or the capital account, and attracted large capital inflows.

Absolute poverty continued to decline in Indonesia and Malaysia, as well as now Thailand and the Philippines. By 1996, one year before the crisis, poverty incidence was less than 10 percent in Malaysia and Thailand and just slightly above 10 percent for Indonesia. In the Philippines, absolute poverty declined from 41 percent to 34 percent by 1991 and then fell dramatically to 25 percent by 1997, which is still more than double that of its ASEAN neighbors.

The growth rate of the Philippines was still much lower compared with the other Southeast Asian economies with growth rates averaging 3.3 per annum in the 1990-98 period and per capita income growth of only 0.8 percent. However, it was remarkable that poverty declined rapidly during this period despite the slower growth.

The dramatic decline in national poverty numbers masks some important problems. In Indonesia the problem of the near poor is not a trivial one, since increasing the poverty line by 25 percent led to a more than doubling of the percentage of the population below the poverty line from 11 percent to 25 percent in 1996. Moreover remote regions and rural areas outside of Java were in a poverty trap and still experienced high levels of absolute poverty.

The pattern of inequality trends also reversed from the previous periods, with Thailand experiencing a decline in inequality and Malaysia and Indonesia experiencing an increase in inequality over the 1990s. In the Philippines, inequality declined over the 1984-94 period, although there were fluctuations within the period, which affected poverty reduction. During the 1985-88 period, growth led to a substantial reduction in poverty and more than offset the increase in poverty incidence due to increased inequitable distribution. However, in 1988-91, the worsening of income distribution swamped the effect of growth on reducing poverty. In the 1991-94 period, both growth and improvement in distribution contributed together to reduce poverty incidence. However, inequality has worsened again in since 1994 and inequality of distribution worsened again between 1994-97.

Income inequality in Thailand worsened through to 1992, except for 1988 and this was a temporary reversal due to exceptionally high agriculture prices. However, the Gini coefficient declined during the 1992-96 period, as has the difference between Bangkok and Northeast per capita incomes. The improvement in income distribution has been attributed to the tight labor market leading to a rise in real
POVERTY AND INEQUALITIES

wages in the formal and manufacturing sector. Differential access and inadequate investment in the secondary level education remain the basic cause of inequity as it was during the previous period.

The conclusion of this review is that few strong conclusions emerge regarding trends in inequality in developing countries and in some cases there is substantial disagreement within the literature. On balance it does seem that inequality is increasing for a majority of developing countries, most uniformly in Eastern Europe and East Asia, and less uniformly in Sub-Saharan Africa and Latin America.

Trends are very much mixed in South Asia. In general there seems to have been a greater increase in inequality as measured by the Theil indices; in part this may because the data is more recent, but it suggests that globalization may be causing intersectoral shifts in the urban, formal industrial sector which is increasing inequality, but that in many countries there are countervailing forces such shifts in urban-rural inequality. For both the Theil and Gini measures, the most consistent evidence is on timing: trends towards increased inequality have generally occurred since the late 1980s, though in some cases this has been a matter of returning to previous levels found in the 1960s or early 1970s. (The major exception has been increasing inequality from the effects of the debt crisis on Latin America in the 1980s). The evidence on inequality between countries seems to be mixed, depending on the conversion measure used and the treatment of China. Perhaps the clearest evidence is that growth has generally slowed substantially in most developing countries, with a higher variance across countries.

The lack of clear trends may be due in part to the poor quality of the data, but it is equally likely that net changes in poverty and inequality are very country specific and the result of multiple forces operating simultaneously. To address this, we turn to those studies of inequality which have applied multivariate regression analysis.

Structural Adjustment And Poverty

The empirical analysis of the impact of structural adjustment on poverty and income inequality started with the selection of operational indicators for four sub-domains. These domains were 1) the size of the economy, 2) the levels of poverty, 3) the distribution of income and wealth and 4) the entitlement of population to basic services and amenities.

The indicators used for assessment of the size of the economy were the per capita gross national product in 1995, the annual growth rate of the gross national product in the period 1980-1995, and the annual growth rate of the per capita gross national product in the same period.
With respect to the levels of poverty, three indicators were used, namely the human poverty index in 1995, the percentage of population below the income poverty line defined as 1$ a day and the percentage of population below the national poverty line. Indicators for distribution of income and wealth included the real per capita gross domestic product of the poorest 20% of the population, the real per capita gross domestic product of the richest 20% of the population and the females’ share of earned income in 1995.

Indicators for the entitlement to basic services and amenities included the percentage of population without access to safe water in 1990-96, the percentage of population without access to health services in 1995, the percentage of population without access to sanitation in 1996 and the percentage of children not reaching grade 5 in 1995.

| Table 15. The correlation between the operational indicators of poverty and health |
|---------------------------------|-----------------|-----------------|-----------------|-----------------|
|                                  | DALE at birth   | Maternal mortality ratio | Infant mortality rate | Survival to age 40 |
| GNP per capita in 1995           | 0.73*           | -0.73*           | -0.79*           | -0.75*           |
| GNP annual growth rate in 1980-95 | 0.21            | -0.15            | -0.23            | -0.23            |
| GNP per capita annual growth rate 1980-95 | 0.29*          | -0.21            | -0.32*           | -0.32*           |
| Human poverty index (HPI-1) value in 1995 | -0.77*         | 0.86*            | 0.86*            | 0.82*            |
| Real GDP per capita (PPP$) Poorest 20% 1980-94 | 0.81*          | -0.67*           | -0.73*           | -0.77*           |
| Real GDP per capita (PPP$) Richest 20% 1980-94 | 0.78*          | -0.75*           | -0.80*           | -0.76*           |
| Population below income poverty 1$ a day | -0.63*         | 0.50*            | 0.59*            | 0.63*            |
| Population below national poverty line in 1989-94 | -0.51*         | 0.40*            | 0.53*            | 0.56*            |
| Share of earned income (%) 1995 Female | -0.6*          | 0.46*            | 0.54*            | 0.56*            |
| Population without access to safe water (1990-96) | -0.6*          | 0.65*            | 0.67*            | 0.66*            |
| Population without access to health services 1995 | -0.52*         | 0.53*            | 0.59*            | 0.54*            |
| Population without access to sanitation 1996 | -0.6*          | 0.62*            | 0.71*            | 0.62*            |
| Children not reaching grade 5 in 1995 | -0.43*         | 0.55*            | 0.57*            | 0.51*            |

The sensitivity of these indicators to the health status was assessed by calculating the correlation coefficient and applying a test of statistical significance for the correlation between each indicator and four indicators for the health status. These were the total population’s disability adjusted life expectancy at birth, the maternal mortality ratio, the infant mortality rate and the percentage of population not expected to survive to age 40. The results of the statistical analysis are shown in table 15.
All indicators but one of the four sub-domains of poverty and inequalities were correlated with the four health indicators in statistically significant manner. The indicator which was not correlated with the health status indicators was the GNP annual growth rate. Furthermore, the directions of the correlation were in the anticipated directions. For example, the per capita GNP was directly associated with the total population's DALE at birth and inversely with the maternal and infant mortality ratios. Likewise, the human poverty index was inversely related to the total population's DALE at birth and directly with the maternal and infant mortality ratios. These results supported the selection of these indicators to serve as sensors for any change in the intermediate domain of poverty between the designated cause (the structural adjustment policies) and the outcome of interest (health Status).

The third step in the analysis was to ascertain the association between the structural adjustment and the poverty indicators. This was done in two manners. The first includes the comparison between the levels of these indicators among adjusting and non-adjusting countries using a test of statistical significance. And the second involves examining the association between the levels of the poverty indicators and the duration of the implementation of the structural adjustment policies.

The logic behind this approach is that establishing a causal relation between structural adjustment and poverty requires among others two criteria. The first is the statistical association between structural adjustment and the poverty indicators. In other terms, adjusting countries should have significantly higher rates of poverty and income inequalities than their non-adjusting counter-parts in the same income category and the region. The second is the establishment of a dose response relationship. This means that early adjusting countries should have higher levels of poverty and inequalities than early adjusting and non-adjusting countries.

**The size of the economy**

Two indicators were used to assess the size of the economy: the per capita GNP in 1995 and the per capita annual growth rate in 1980-95. The third indicator, which is the GNP annual growth rate, was excluded from the analysis since it was not correlated with the health status indicators. Comparisons were stratified by national income category and region. The national income category was obtained from the 1999's World Bank classification.

**The Per Capita GNP**

The per capita GNP was shown to be associated with the health status indicators. Figure 151 shows the relationship between the per capita GNP and the total population's disability Adjusted life expectancy at birth. It is clear that countries with higher per capita GNP has also longer DALE at birth.
The per capita GNP was shown to vary among national income categories and regions in a statistically significant manner. Statistical significance was defined at a P-value less than 0.01.

In the low income countries, the average per capita GNP in 1995 ranged between 80 and 9700 US$. The average was estimated at 578 $ with a standard deviation of 1378. The average for the lower middle income countries was 1560$ with a standard deviation of 689$ and the range extended between 590$ and 3160$. The upper middle income countries had an average of 1817$, a standard deviation of 2750$ and range between 2750$ and 8030$. The differences were statistically significant.

Likewise, the per capita GNP in 1995 was shown to differ significantly among regions, with sub-Saharan Africa reporting the lowest figures. For this region, the average was estimated at 725$ ± 958. compared with 2579±2695 for the Middle East and North Africa, 2354$±1884 for the Latin America and 1519$±2492 for the Asia and Pacific.

*Figure 151. Disability Adjusted Life Expectancy at Birth and Per Capita Gross National Product*
Figure 152. Infant Mortality Rate and Per Capita Gross National Product

Figure 153. Maternal Mortality Rate and Per Capita Gross National Product
The overall average of the Per capita GNP in 1995 did not appear to differ significantly between adjusting and non-adjusting countries. The means for both groups were estimated at $1299 \pm 1772$ and $2160 \pm 2336$, respectively. The disparities among countries were great in both groups. Among adjusting countries, the per capita GNP varied between a minimum of $80$ and a maximum of $9700$. Likewise, non-adjusting countries showed figures varying between $120$ and $7840$.

Stratifying the analysis by national income category revealed that the differences between adjusting and non-adjusting countries in terms of the per capita GNP were statistically insignificant in all national income categories. In the low income category, the average per capita GNP was $647 \pm 1526$ for adjusting countries and $286 \pm 147$ for non-adjusting countries. The difference was statistically insignificant because of the wide variation among adjusting low income countries. For the lower middle income category, the average was estimated at $1483 \pm 636$ for adjusting countries and $1905 \pm 916$ for non-adjusting countries. Adjusting upper middle income countries had an average of $4366 \pm 1784$ and non-adjusting countries in the same category had an average of $4716 \pm 1975$. 

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**Figure 154. Population not Expected to Survive to Age 40 and Per Capita Gross National Product**
Within region comparisons showed that only in the sub-Saharan African region there was a statistically significant difference between adjusting and non-adjusting countries with respect to the per capita GNP. The average was estimated at 494±615$ for adjusting countries and at 1561±1478$ for non-adjusting countries. The difference is explained by the fact that three non-adjusting countries are rich in oil and minerals and have therefore exceptionally high per capita GNP. When these countries were removed from the analysis the difference disappeared between adjusting and non-adjusting countries.

In the Middle East and North Africa adjusting countries had an average of 1215±522, compared with an average of 4216±3417 for non-adjusting countries. Again, the difference was not statistically significant due to the wide variations in non-adjusting countries of the region. In the Latin America and the Asia and Pacific regions adjusting countries had a higher average than non-adjusting countries, but it was not statistically significant. The averages were estimated to be 2498±1955$ and 1537±1395$ in Latin America and 1615±2779$ and 1255±1765$ in Asia and Pacific, for adjusting and non-adjusting countries respectively.

Figure 155. Per Capita Gross National Product in Adjusting and Non-adjusting Countries by National Income Category
Figure 156. Per Capita Gross National Product in Adjusting and Non-adjusting Countries by Region

Figure 157. Duration of Structural Adjustment Implementation and Per Capita Gross National Product
The Per Capita GNP Annual Growth Rate

The annual growth rate of the per capita GNP is the second indicator for the size of the economy. The coefficients for the correlation between this indicator and the health status indicators indicate that the annual growth rate of the per capita GNP is directly associated with the disability adjusted life expectancy at birth and inversely with the infant mortality rate, the maternal mortality ratio and the percentage of the population not expected to survive to age 40.

The average annual growth rate of the per capita GNP for the period 1980-95 was shown to be higher in lower middle income countries than low income and upper middle income countries. However, the difference was not statistically significant. The annual growth rate in the low income countries averaged at 0.3±3.0%. Twenty-two low income countries reported reversals in the GNP per capita growth that reached up to –5.8%. Thirteen low income countries reported positive growth that ranged from 0.01% to 8.6%.

Lower middle income countries had an average annual growth rate of 0.7±1.8%. The values ranged between a minimum of –1.7% to 6.3% per annum. Ten countries had negative annual growth rates but the decline was less than those low income countries, which reported negative growth.

Figure 158. Disability Adjusted Life Expectancy at Birth and Per Capita GNP annual Growth Rate
Figure 159. Infant Mortality Rate and Per Capita GNP annual Growth Rate

Figure 160. Maternal Mortality Rate and Per Capita GNP annual Growth Rate
Upper middle income countries had an average annual growth rate of 0.5% in the same period. Countries ranged between a minimum of -4.3% and a maximum of 8.6% per annum. Eight countries reported negative growth rates of and the rest reported positive growth rates. The average annual growth rate of the per capita GNP for all countries was estimated to be 0.3%±2.7.

The regional analysis showed that sub-Saharan Africa and the Asia and Pacific regions witnessed a decline in the per capita GNP. The average annual growth rate of the per capita GNP for the two regions were estimated to be -0.5%±2.4 and -0.4%±1.6, respectively. The Middle East and North Africa had an average growth rate of 0.3%±2.3 per annum. Only the Asia and Pacific region reported a considerable positive growth in the magnitude of 3.9%±2.7.

The annual per capita GNP growth rate did not appear to differ between adjusting and non-adjusting countries. The overall average for adjusting countries was estimated to be 0.3%±2.2 per annum, compared with 0.3%±4.1 per annum for non-adjusting countries. The minimum and maximum values were -4.3% and 7.5% in adjusting countries and -5.8% and 8.6% in non-adjusting countries, respectively.
The 95% confidence interval for the mean was estimated to range between -0.3% and 0.9% in adjusting countries and -1.9% and 2.5% for non-adjusting countries. These differences were statistically insignificant.

Stratifying the analysis by national income countries revealed that the annual per capita GNP growth rate in the period 1980-95 did not differ significantly between adjusting and non-adjusting countries in all national income categories. In the low income category adjusting countries growth rates varied between a minimum of -3.7% and a maximum of 7.5% per annum. The mean was estimated to be 0.1%±2.4 and the 95% confidence interval for the mean to be -0.7% and 1%. Non-adjusting countries in the same income category varied between -5.8% and 8.6% per annum. The mean was estimated to be -0.5%±6.0 and the 95% confidence interval for the mean to be from -8.0% to 6.9%.

Adjusting lower middle income countries had an average per capita GNP annual growth rate of 1%±1.9, compared with -0.6%±0.6 for non-adjusting countries in the same income category. The rates for adjusting countries ranged between -1.7% and 6.3% and the 95% confidence interval for the mean extended between -0.03% and 1.9%. For non-adjusting countries the minimal growth rate was -1.3% and the maximum 0.1%, while the 95% confidence interval for the mean was estimated between -1.6% and 0.4%.

In the Upper Middle income category adjusting countries had a mean annual growth rate of -0.5%±2.2, compared with 1.4%±3.8. The range extended between -4.3% and 3.2% in adjusting countries and between -4.0% and 5.4% in non-adjusting countries. The 95% confidence interval for the mean was estimated to have a lower limit of -2.5% and an upper limit of 1.6% in adjusting countries. Respective lower and upper limits for non-adjusting countries were -2.1% and 5%.

Within-region analysis of the association between structural adjustment and the per capita GNP annual growth rate in the 1980-95 period revealed that only in the Latin America there was a statistically significant difference. Adjusting Latin American countries had an average growth rate of -0.1%±1.5, compared with -2%±1.6 for non-adjusting countries. The 95% confidence interval for the mean ranged between a lower limit of -0.9% and an upper limit of 0.6% in adjusting countries and between -6.2% and 1.9% in non-adjusting countries.

The differences shows a favourable per capita GNP annual growth rate in adjusting countries than non-adjusting countries of the region.
Figure 162. Per Capita GNP Annual Growth Rate in Adjusting and Non-adjusting Countries by National Income Category

Figure 163. Per Capita GNP Annual Growth Rate in Adjusting and Non-adjusting Countries by Region
In all other regions the differences were statistically insignificant. The mean for adjusting countries of the sub-Saharan Africa was estimated at -0.5%±2.4, compared with 0.3%±4.6 for non-adjusting countries in the region. The 95% confidence interval of the mean was -1.3% to 0.09% in adjusting countries and -4.5% to 5.1% in non-adjusting countries.

In the Middle east and North Africa adjusting countries had an average per capita GNP annual growth rate of 1.1%±1.4, compared with -0.6%±2.9 for non-adjusting countries. The upper and lower limits of the 95% confidence interval for the mean were -0.6% and 2.8% in adjusting countries and -4.2% and 3.0% in non-adjusting countries.

Adjusting countries in the Asia and Pacific were estimated to have an average per capita GNP annual growth rate of 3.3%±2.5, compared with 6.3%±3.2 for non-adjusting countries in the region. The lower and upper limits of the 95% confidence interval for the mean were 1.5% and 5.3% in adjusting countries versus -2.3% and 9.1% in non-adjusting countries.

**Figure 164. Duration of Structural Adjustment Implementation and Per Capita GNP Annual Growth Rate**

**LEVELS OF POVERTY**

The levels of poverty were assessed using three indicators, namely the human poverty index in 1995, the percentage of population below the income poverty line defined as 1$ a day and the percentage of population below the national poverty line. The three indicators were shown to be inversely correlated with the total
population’s DALE at birth and to be directly correlated with the infant mortality rate, the maternal mortality ratio and the percentage population not expected to survive to age 40.

**The Human Poverty Index**

The mean human poverty index for the 90 countries included in the analysis was 31.1%±14.4. The lowest value of the HPI was reported in Uruguay and Chile (4.1%) and the highest value in the Niger 62.1%. The HPI was shown to vary between the three national income categories and the differences were statistically significant. The low income category has a mean HPI of 39.2%±11.4, compared with 21.2%±8.7 for lower middle income category and 14.4%±9.4.

Likewise, the HPI differed among regions in a statistically significant manner. Sub-Saharan Africa had the highest HPI, estimated at 40.6%±11.4. However, the difference among countries in the region varied between 12.1% in Angola and 62.1% in Niger. The Middle East and North Africa reported the second worst value for the HPI, estimated at 30.1%±12.2. Similarly, the values varied between a minimum of 10% in Bahrain and 48.9% in Yemen. The Asia and Pacific had an average HPI of 26.6%±11.5 and the index varied between 11.9% in and 46.5% in. Finally, the Latin America showed the lowest regional average of the HPI, which was estimated to be 18%±10.8. However, disparities among countries was evident. The lowest HPI was found in Cuba (10%) and the highest in Haiti (44.5%).

![Figure 165. Disability Adjusted Life Expectancy at Birth and Human Poverty Index](image-url)
Figure 166. Infant Mortality Rate and Human Poverty Index

Human poverty index (HPI-1) value (%) 1995

Ethiopia
Zambia
Congo
Cambodia
Malawi
Uganda
Guinea
Niger
Sudan
Sri Lanka
G-Bissau
Indonesia
Lesotho
Morocco
Ghana
Mali
Peru
Ecuador
El Salvador
Mauritania
Burkina Faso
Zimbabwe
Mongolia
India
Uruguay
Mexico
Libya

Figure 167. Maternal Mortality Rate and Human Poverty Index

Human poverty index (HPI-1) value (%) 1995

Ethiopia
Zambia
Guinea
Haiti
Malawi
Tanzania
Uganda
Guinea
Niger
Cameroon
Nigeria
Burundi
Kenya
Namibia
Yemen
Indonesia
Mozambique
Senegal
Ghana
Mali
China
Peru
El Salvador
Pakistan
B. Faso
India
Philippines
Egypt
Thailand
Bangladesh
Jordan
Comparing the Human Poverty Index between adjusting and non-adjusting countries yielded statistically insignificant differences. The aggregate mean HPI was estimated at 30.9%±14.8 for adjusting countries, compared with 31.9%±13.5 for non-adjusting countries. The lower and upper limits of the 95% confidence interval for the mean were 26.8% and 34.9% in adjusting countries and 24.7% and 39.1% in non-adjusting countries. Within each group the disparities among countries were evident. Among adjusting countries, Uruguay and Chile had HPI as low as 4.1%, while Burkina Faso had a HPI as high as 58.2%. Likewise, non-adjusting countries showed variations between 12.1% in Mauritius and 62.1% in Niger.

Stratifying analysis by national income category revealed that only in the upper middle income category the HPI was significantly different between adjusting and non-adjusting countries. The difference was, however, in favor of structural adjustment. While non-adjusting upper middle income countries had an aggregate average of 21.4%±8.0, adjusting countries in the same income category had an average of only 7.5%±3.9. The lower and upper limits of the 95% confidence interval for the mean HPI were 1.5% and 13.8% in adjusting countries versus 8.7% and 34% in non-adjusting countries.
Figure 169. Human Poverty Index in Adjusting and Non-adjusting Countries by National Income Category

Country income category

Figure 170. Human Poverty Index in Adjusting and Non-adjusting Countries by Region

Region
Interestingly, although the differences in the two other income groups were statistically insignificant, adjusting countries continued to have lower aggregate HPI means than non-adjusting countries. For example, adjusting low income countries had an aggregate HPI mean of 38.9%±10.9, compared with 40.3%±13.7 for non-adjusting countries. The 95% confidence interval for the aggregate HPI mean ranged between a lower limit of 35.0% and an upper limit of 42.8% in adjusting countries. The corresponding lower and upper limits in non-adjusting countries were 18.8% and 51.7%.

Calculations within the lower middle income category showed that the aggregate HPI mean was 20.1%±9.2 in adjusting countries and 25.6%±4.7 in non-adjusting countries. The lower and upper limits of the 95% confidence interval for the aggregate HPI mean were 15.2% and 25.0% in adjusting countries, versus 18.1% and 33.1% in non-adjusting countries.

Within region comparisons of the HPI between adjusting and non-adjusting countries revealed that only in Latin America the difference was statistically significant. Again, the difference was in favour of adjusting countries, which showed far lower aggregate HPI average than non-adjusting countries. The aggregate HPI mean for adjusting Latin American countries was estimated at 15.3%±7.9 (95%CI, 10.7% - 19.9%), compared with 36.9%±10.7 (95% CI, 29.3% - 44.5%) for non-adjusting countries in the region.

Figure 171. Duration of Structural Adjustment Implementation and Human Poverty Index

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<table>
<thead>
<tr>
<th>Country</th>
<th>Duration of Adjustment Program in Years</th>
<th>Human Poverty Index (HPI-1) value (%) 1995</th>
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339
In the three other regions the differences in the aggregate HPI averages were statistically indifferent between adjusting and non-adjusting countries. In sub-Saharan Africa the aggregate average was estimated at 41.9%±9.3 (95% CI, 37.9% - 45.8%) for adjusting countries, compared with 34.5%±18.6 (95% CI, 11.4% - 57.6%) for non-adjusting countries. In the Middle East and North Africa, the aggregate average was 30.1±12.9 (95% CI, 16.6% - 43.6%) in adjusting countries for adjusting countries and 30.1±12.8 (95% CI, 16.7% - 43.5%) for non-adjusting countries. Finally, adjusting countries in the Asia and Pacific region had an average of 26.2±12.2 (95% CI, 16.9% - 35.6%), compared with an average of 27.7±11.5 (95% CI, 17.1% - 39.9%) for non-adjusting countries in the region.

The linear regression analysis revealed that the duration of structural adjustment in years is not associated with the human poverty index score. The non-parametric spearman’s correlation coefficient was estimated at 0.06 and the regression β-coefficient at 0.02, both were shown to be statistically insignificant.

**Population Below the absolute Income Poverty**

The second indicator for levels of poverty is the 1989-95 percentage of population below the income poverty line, which is defined as 1$ a day. Data were available for 49 countries, which were included in the analysis. Stratification by income category and region was not done due to the limited number of countries whose data were available. The indicators was shown to be inversely correlated with the total population’s DALE at birth and directly correlated with the infant mortality rate, the maternal mortality ratio and the percentage of population not expected to survive to age 40. The correlations were found all to be statistically significant. (figure 172 through 175).

The aggregate mean of the proportion of population below the 1$ income poverty for the 49 countries was estimated to be 29.9%±22.3. There was wide a wide variation among countries, which varied between a minimum of 0.1% in Thailand and a maximum of 87% in Guinea-Bissau. The limits of the 95% confidence interval for the mean were estimated at 23.4% and 36.5%.

Calculation and comparison of the aggregate averages for adjusting and non-adjusting countries revealed statistically insignificant differences. In average, a proportion in the magnitude of 29.7%±22.8 of the population in adjusting countries were below the 1$ poverty line in the period between 1989 and 1995. This is compared to a proportion of 31.4%±20.5 in non-adjusting countries. The lower and upper limits of the 95% confidence intervals for the aggregate mean were 22.4% and 37% in adjusting countries versus 12.5% and 50.3% in non-adjusting countries.
Figure 172. Population below 1$ a Day Income Poverty and Disability Adjusted Life Expectancy at Birth

Population below income poverty (%) 1$ a day (1985 PPP$) 1989-94

Figure 173. Population below 1$ a Day Income Poverty and Infant Mortality Rate

Population below income poverty (%) 1$ a day (1985 PPP$) 1989-94
Figure 174. Population below 1$ a Day Income Poverty and Maternal Mortality Rate

Population below income poverty (%) 1$ a day (1985 PPP$) 1989-94

Figure 175. Population below 1$ a Day Income Poverty and Population Not Expected to Survive to Age 40

Population below income poverty (%) 1$ a day (1985 PPP$) 1989-94
Figure 176. Below 1$ a Day Income Poverty in Adjusting and Non-adjusting Countries by National Income Category

Country income category

Figure 177. Population below 1$ a Day Income Poverty and Disability Adjusted Life Expectancy at Birth

Duration of Adjustment Program in Years
The correlation and the linear regression analyses revealed that the proportion of the population below the 1$ income poverty line was not associated with the duration of the structural adjustment implementation in years. The non-parametric Spearman’s correlation coefficient was estimated at 0.1 and the regression $\beta$ coefficient at 0.03. Both coefficients were statistically insignificant.

**Population below National Income Poverty**

The third indicator for levels of poverty is the proportion of population below the national poverty line. The indicator was shown to be inversely related to the total population’s DALE at birth and to be directly related to the infant mortality rate, the maternal mortality ratio and the percentage of population not expected to survive to age 40. The correlation coefficients were estimated at between this indicator and the four health indicators respectively. Figure 178 through 181 illustrate these relations.

The proportion of population under the national poverty line ranged between a minimum of 8% in Indonesia to a 86% in Zambia. The aggregate average for all countries was estimated to be 34.1%±17.5. The lower and upper limits of the 95% confidence interval for the mean were 28.9% and 39.4% respectively. The aggregate average for adjusting countries was estimated at 34.8%±17.2, compared with 29.7%±20.7 for non-adjusting countries. The lower and upper limits for the 95% confidence interval for the mean were 29.2% and 40.4% in adjusting countries versus 7.9% and 51.4% in non-adjusting countries. The differences were statistically insignificant.

**Figure 178. Population below National Income Poverty Line and Disability Adjusted Life Expectancy at Birth**
Figure 179. Population below National Income Poverty Line and Infant Mortality Rate

Population below income poverty (%) national poverty line 1989-94

Figure 180. Population below National Income Poverty Line and Maternal Mortality Rate

Population below income poverty (%) national poverty line 1989-94
Figure 181. Population below National Income Poverty Line and Population not Expected to Survive to Age 40

Population below income poverty (%) national poverty line 1989-94

Figure 182. Population Below 1$ a Day Income Poverty in Adjusting and Non-adjusting Countries
Figure 183. Population Below 1$ a Day Income Poverty by National Income Category

Country income category

Figure 184. Population Below 1$ a Day Income Poverty by Region

Region
The linear regression analysis and the correlation analysis revealed that the percentage of population under the national poverty line was not associated with the duration of structural adjustment implementation in years. The non-parametric Spearman correlation coefficient was estimated at 0.111 and the linear regression $\beta$ coefficient at 0.142. Both were shown to be statistically insignificant.

INCOME AND WEALTH DISTRIBUTION

The per Capita GDP of the poorest versus richest

Indicators for distribution of income and wealth included the real per capita gross domestic product of the poorest 20% of the population, the real per capita gross domestic product of the richest 20% of the population and the females’ share of earned income in 1995.

Data from 46 countries showed that the real per capita GDP of the poorest 20% of the population was shown to be significantly correlated with the four health status indicators. It was directly correlated with the total population’s DALE at birth and inversely correlated with the infant mortality rate, the maternal mortality ratio and
the percentage of population not expected to survive to age 40, the Associations are illustrated in figure 186 through 189.

Figure 186. The Real Per Capita GDP of the Poorest 20% and Disability Adjusted Life Expectancy at Birth

Real GDP per capita (PPP$) Poorest 20% 1980-94

Figure 187. The Real Per Capita GDP of the Poorest 20% and Infant Mortality Rate

Real GDP per capita (PPP$) Poorest 20% 1980-94
Figure 188. The Real Per Capita GDP of the Poorest 20% and Maternal Mortality Ratio

Figure 189. The Real Per Capita GDP of the Poorest 20% and Population not Expected to Survive to Age 40
The aggregate average of the real per capita GDP of the poorest 20% of the population for all countries was estimated to be $785 \pm 522. There was evident disparities among countries, with the poorest 20% of the population in a country like Guinea Bissau had a real per capita GDP as low as $10, compared with $1923 in Malaysia. The lower and upper limits for the mean were $632$ and $938$.

The real per capita GDP of the richest 20% was estimated at $8204 \pm 6541$. Countries varied between a minimum of $1430$ in Tanzania and a maximum of $1923$ in Chile. The 95% confidence interval for the mean was estimated to range between a lower limit of $6,283$ and an upper limit of $10,124$.

The inequalities in income and wealth distribution were evident from the data of these 46 countries. The per capita GDP of the poorest 20% was only 11.7% $\pm 6.3$ of the that of the richest 20%. The real per capita GDP of the poorest 20% was less than 10% of that of the richest 20% in Brazil, Guatemala, Panama, Guinea-Bissau, Lesotho, South Africa, Kenya, Chile, Senegal, Guinea, Venezuela, Zimbabwe, Colombia, Honduras, Mexico, Nicaragua, Zambia, Mauritania, Costa Rica, Nigeria and Malaysia. Countries are sorted in an ascending manner.

India, Pakistan, Egypt, Indonesia, Sri Lanka, Nepal, Lao and Bangladesh reported the highest ratios among the 46 countries. The poorest 20% in these countries had a per capita GDP which is only one-fifth to one-fourth of the real per capita GDP of the richest 20%.

![Figure 190. Real Per Capita GDP of the Poorest 20% by National Income Category](image)
Figure 191. Real Per Capita GDP of the Poorest 20% by Region

Figure 192. Real Per Capita GDP of the Poorest 20% in Adjusting and Non-adjusting Countries
Comparing these indicators between adjusting and non-adjusting countries yielded statistically insignificant differences. The real per capita GDP of the poorest 20% was estimated to be 779$±508 for adjusting countries, compared with 819$±639 for non-adjusting countries. The 95% confidence interval showed that the mean for adjusting countries lies between 615$ and 942$ and that the mean for non-adjusting countries lies between 227$ and 1408$.

The real per capita GDP of the richest 20% was estimated at 7724$±5988 for adjusting countries and at 10944$±9205 for non-adjusting countries. The lower and upper limits for the 95% confidence interval were 5809$ and 9639$ for adjusting countries versus 2430$ and 19458$ for non-adjusting countries. Applying a test of statistical significance showed that these differences were not statistically significant.

Comparing the real per capita GDP of the poorest 20% as a percentage of that of the richest 20% was compared between adjusting and non-adjusting countries yielded statistically insignificant differences. In adjusting countries the average was estimated to be 12%±6.4, compared with 10.3%±5.9 in non-adjusting countries. The lower and upper limits of the 95% confidence interval for the mean were 9.9% and 14% in adjusting countries versus 4.8% and 15.8% in non-adjusting countries.
Female's Share in Earned Income

The female’s share of earned income was also shown to be correlated with the health status indicators. Figure 194 through 197 show that the female share of earned income is directly related to the total population’s DALE at birth and inversely related to the infant mortality rate, the maternal mortality ratio and the proportion of population not expected to survive to age 40.

The aggregate average for all countries of the female’s share of earned income was 31.5%±8.1.. The smallest share was recorded in Saudi Arabia (10%) and the highest in Tanzania (47.3%). The female’s share of earned income was less than one-fourth in 20 countries. These were Saudi Arabia, Oman, Bahrain, Libya, Ecuador, Iran, Jordan, Algeria, Syria, Pakistan, Yemen, Guatemala, Chile, Argentina, Sudan, Bangladesh, Paraguay, Peru, Honduras, Tunisia. Countries are sorted in an ascending manner.

The female’s share in earned income was shown to differ among income category and the difference was statistically significant. The average was estimated to be 35.3%±6.5 in low income countries, 27.7%±6.4 in lower middle income countries and 25.5%±9.1 in upper middle income countries. Likewise, there was a statistically significant difference among regions. Africa reported the highest regional average for the female’s share in earned income, estimated at 36.6%±4.8. This is compared with 19.3%±5.1 in the Middle East and North Africa, 27.7%±5.3 in the Latin America and 34.9% in the Asia and Pacific.

Figure 194. Female's Share of Earned Income and Disability Adjusted Life Expectancy at Birth
Figure 195. Female's Share of Earned Income and Infant Mortality Rate

Figure 196. Female's Share of Earned Income and Maternal Mortality Rate
Comparing the aggregate average of the female’s share in earned income between adjusting and non-adjusting countries yielded small a difference, which was statistically insignificant. Adjusting countries had an average of 32.5%±7.1, compared with 29.1%±10 for non-adjusting countries. The lower and upper limits of the 95% confidence interval for the mean were estimated at 30.7% and 34.3% for adjusting countries and at 25.1% and 33.1% for non-adjusting countries.

Within all country income categories the female’s share of earned income did not differ between adjusting and non-adjusting countries in a statistically significant manner. For adjusting countries the mean of female’s share in earned income was 35.3%±6.3 in low income countries, 28.2±6.4 in lower middle countries and 28.3%±5.7 in upper middle income countries. The corresponding figures for non-adjusting countries were 33.4%±7.3, 26.1%±6.8 and 23.4%±10.9, respectively.

Within-region analysis showed that only in the Middle East and North Africa there was statistically significant difference. Adjusting countries in the region were shown to have higher female’s share in earned income (22.7%±3.6) than non-adjusting countries (16.8%±4.7). In other regions, adjusting countries were shown to have an average of 37.2%±4.8 in Africa, 27.4%±5.2 in the Latin America and 33.2%±5.4 in the Asia and Pacific. This is compared with 34.8%±4.3, 29%±6.2 and 38.4±5.6 for non-adjusting countries in the three region respectively.
Figure 198. Female's Share of Earned Income in Adjusting and Non-adjusting Countries by National Income Category

Country income category

Figure 199. Female's Share of Earned Income in Adjusting and Non-adjusting Countries by Region
The linear regression and the correlation analyses showed that the duration of structural adjustment implementation was not associated with the female’s share in earned incomes. The non-parametric Spearman correlation coefficient and the linear regression $\beta$ coefficient were estimated at 0.3 and 0.2. Both values were shown to be statistically insignificant. Figure 200 illustrates the association and make clear that there was no specific pattern of association between the two variables and that early implementers of structural adjustment do not show statistically significant differences for late and non-implementers of structural adjustment with respect to the female’s share in earned income.

**ENTITLEMENT TO BASIC SERVICES**

**Entitlement to Safe Water**

Four indicators were used to assess the entitlement of the population to the basic services. The indicators monitor the proportion of the population without access to potable water, sanitation and health services. Access to education was assessed by the proportion of children not reaching grade 5 in schools. All four indicators were shown to be significantly correlated with the health status indicators. Figure 201 through 204 show that the four indicators were inversely related to the total population’s DALE at birth and directly related to the infant mortality rate, the
maternal mortality ratio and the proportion of population not expected to survive to age 40.

Figure 201. Inaccessibility to Safe Water and Disability Adjusted Life Expectancy at Birth

![Graph showing the relationship between population without access to safe water and Disability Adjusted Life Expectancy at Birth.](image)

Figure 202. Inaccessibility to Safe Water and Infant Mortality rate

![Graph showing the relationship between population without access to safe water and Infant Mortality rate.](image)
Figure 203. Inaccessibility to Safe Water and Maternal Mortality Rate

Population without access to safe water (%) 1990-96

Figure 204. Inaccessibility to Safe Water and Population not Expected to Survive to Age 40

Population without access to safe water (%) 1990-96
The aggregate statistics for all countries showed that in average almost one third (33.7%±21.3) of the population did not have an access to safe water in the period 1990-96. However, there were wide differences among countries. For example, only 1% of the population in South Africa had no access to safe water. This is compared to a proportion in the magnitude of 87% in Eritrea. In 20 countries the proportion of the population without access to safe water exceeded the half. These were Nigeria, Cameroon, Benin, Sudan, Niger, Gambia, Guinea, Uganda, Lao, Viet Nam, Democratic republic of the Congo, Central African Republic, Tanzania, Malawi, Haiti, Cambodia, Congo, Madagascar, Angola, Papua New Guinea, Zambia, Ethiopia, Chad and Eritrea.

Inaccessibility to safe water was shown to differ significantly with the national income category. The low income countries had an aggregate average of 45.7%±18.9 of the population without access to safe water. This is compared with 21.8%±15.0 for lower middle income countries and 14.4%±10.1 for upper middle income countries. The lower and upper limits of the 95% confidence interval for the mean were 40.3% and 51.2% in low income countries, 15.6% and 28.0 in lower middle income countries and 8.8% and 20.0% in upper middle income countries. The differences were statistically significant.

Similarly, there was a statistically significant difference among regions in inaccessibility to safe water. Sub-Saharan Africa had the highest regional average (44.8%±20.4), followed by the Asia and Pacific (32.3%±21.2), the Latin America (23.7%±15.3) and the Middle East and North Africa (18.4%±15.4). The lower and upper limits of the 95% confidence interval for the mean were estimated to be 38.2% and 51.5% in sub-Saharan Africa, 21% and 43.4% in the Asia and Pacific, 16.8% and 30.7% in the Latin America and 9.1% and 27.7% in the Middle East and North Africa.

Although the inaccessibility to safe water differed significantly among national income categories and regions, it was not shown to differ with structural adjustment. The average of population without access to safe water was estimated to be 34.2%±19.6 in adjusting countries versus 32.4±25.4 in non-adjusting countries. The 95% confidence interval for the mean was estimated to have a lower limit of 29.3% and an upper limit of 39.2% in adjusting countries. This is compared with 22.2% and 42.7% in non-adjusting countries respectively. The differences were statistically insignificant.

Stratifying the analysis by national income category showed that a statistically significant difference between adjusting countries and non-adjusting countries was found only in the low income category. The difference was, however, in favour of
structural adjustment. Adjusting low income countries had an average of 42.2%±18.7 of their population without access to safe water. Non-adjusting countries in the same income category had an average of 58%±14.1. The lower middle income category estimates showed that the mean was 24.3%±15.1 for adjusting countries versus 15.4%±13.9 for non-adjusting countries. Adjusting upper middle income countries had an average of 17%±11.6, compared with 12.1%±8.6 for non-adjusting countries in the same income category. The differences in the lower and upper middle income categories were statistically insignificant.

Within-region comparisons showed that the differences in the proportion of population without access to safe water between adjusting and non-adjusting countries were statistically insignificant in all regions. In the sub-Saharan Africa adjusting countries had an average of 46.7%±15.2, compared with 39.5%±31.5 for non-adjusting countries. In the Middle East and North Africa the means for adjusting and non-adjusting countries were 16.7%±13.4 and 19.9%±17.9 respectively. Adjusting countries in the Latin America had an average of 22.6%±13.3 versus 28.5%±24.1 for non-adjusting countries in the region. In the Asia and Pacific adjusting countries had an average of 29.3%±21.8 and non-adjusting countries had an average of 39%±20.5.

Figure 205. Inaccessibility to Safe Water in Adjusting and Non-adjusting Countries by National Income Category
Figure 206. Inaccessibility to Safe Water in Adjusting and Non-adjusting Countries by Region

Population without access to safe water (%) 1990-96

Africa Middle East Americas Asia & Pacific

Figure 207. Duration of Structural Adjustment Implementation and Inaccessibility to Safe Water

Duration of Adjustment Program in Years

Population without access to safe water (%) 1990-96
The correlation analysis and the linear regression analysis showed that the proportion of the population without access to safe water was not associated with the duration of structural adjustment implementation in years. The non-parametric Spearman correlation coefficient and the regression $\beta$ coefficient were estimated at 0.07 and 0.05 respectively. Both values were statistically insignificant.

**Entitlement to Basic Sanitation**

Inaccessibility to sanitation is the second indicator for entitlement to basic services. The indicator was shown to be associated with the four health status indicators. The correlation analysis showed that the proportion of population without access to basic sanitation is inversely related to the total population’s disability adjusted life expectancy at birth. Furthermore, it was found to be directly related to the infant mortality rate, the maternal mortality ratio and the proportion of population not expected to survive to age 40. Figure 208 through 211 show the association between inaccessibility to basic sanitation and these four health status indicators.

![Figure 208. Inaccessibility to Sanitation and Disability Adjusted Life Expectancy at Birth](image-url)
Figure 209. Inaccessibility to Sanitation and Infant Mortality Rate

Population without access to sanitation (%) 1990-96

Figure 210. Inaccessibility to Sanitation and Maternal Mortality Ratio

Population without access to sanitation (%) 1990-96
The aggregate average for all countries showed that about 46.5%±26.5 of the population in low and middle income countries did not have an access to sanitation. Countries showed a wide range of disparities, which extended between a minimum of 0% in Mauritius and the Republic of Korea and a maximum of 94% in Mali and Malawi. At least half of the population in 37 countries did not have access to sanitation. These countries were Cameroon, Bangladesh, Pakistan, Paraguay, Togo, Madagascar, Côte d'Ivoire, Senegal, Lesotho, Burkina Faso, Gambia, Namibia, Mauritania, Nicaragua, Guinea, Guinea-Bissau, India, Central African Republic, Haiti, China, Yemen, Cape Verde, Comoros, Sudan, Papua New Guinea, Viet Nam, Chad, Benin, Ethiopia, Nepal, La, Democratic Republic of the Congo, Niger, Angola, Cambodia, Mali and Malawi.

Inaccessibility to sanitation was shown to differ significantly with national income categories. The mean proportion of population without access to sanitation was estimated to be 60.9%±22.5 for low income countries, 29.7%±18.4 for lower middle income countries and 21.5%±15.2 for upper middle income countries. The differences were statistically significant.

Likewise, inaccessibility to sanitation was shown to differ among regions in a statistically significant manner. Sub-Saharan Africa had the highest figure of inaccessibility, with more than the half (58.6%±21.4) of the population live without access to sanitation. The Asia and the Pacific region came second with an average of
49.4±32.4. The Middle East and North Africa and the Latin America had similar regional averages, estimated at 31%±24.5 and 31%±18.8 respectively.

However, structural adjustment was not shown to play a determining role in the entitlement of the population to sanitation services. The proportion of the population without access to sanitation was shown to be 45.5%±26.5 in adjusting countries and 49.5±30.1 in non-adjusting countries. The lower and upper limits of the 95% confidence interval for the mean were 38.8% and 51.7% for adjusting countries and 36.8% and 62.2% for non-adjusting countries. Applying a test of statistical significance to these figures showed that the differences were statistically insignificant.

Stratifying the analysis between structural adjustment and inaccessibility to sanitation by national income category revealed that only within the low income category there was a statistically significant association. However, the difference was in favor of adjusting countries, which had significantly lesser proportion of population without access to sanitation than non-adjusting countries. The average was 55.9%±22.8 for adjusting countries and 79.8%±3.8 for non-adjusting countries. In the lower and upper middle income categories the difference between the means was not statistically significant. Lower middle income adjusting countries had a mean of 26.7%±18.4, compared with 37.3%±17.1 for non-adjusting countries. In the Upper middle income category the mean was estimated to be 26.7%±6.7 and 18.6%±18.3 for adjusting and non-adjusting countries respectively.

Figure 212. Inaccessibility to Basic Sanitation in Adjusting and Non-adjusting Countries by National Income Category
Figure 213. Inaccessibility to Basic Sanitation in Adjusting and Non-adjusting Countries by Region

Figure 214. Duration of Structural Adjustment Implementation and Inaccessibility to Basic Sanitation
Regional stratification of the analysis showed that adjusting and non-adjusting countries had statistically insignificant differences in the proportion of the population without access to sanitation in all regions. In sub-Saharan Africa the means were estimated at 58.5%±19.6 for adjusting countries and at 59%±27.8 for non-adjusting countries. Adjusting countries of the Middle East and North Africa had an average of 26.5%±17.4, compared with 34.9%±30.2 for non-adjusting countries of the region. The figures for the Latin America were 29.1%±16.9 and 41.8%±24.3 for adjusting and non-adjusting countries respectively. The Asia and Pacific region had an average of 44.9%±31.1 for adjusting countries and 61.8%±37.4 for non-adjusting countries.

The linear regression analysis for the association between the percentage of population without access to sanitation and the duration of structural adjustment implementation in years showed that there was no statistically significant association. The non-parametric Spearman correlation coefficient and the regression $\beta$ coefficient were estimated at $-0.04$ and $-0.03$, which were statistically insignificant.

**Entitlement to health services**

The population proportion without access to basic health services is used here as an indicator for the population entitlement to health services. The indicator was shown to be inversely associated with the total population’s DALE at birth and directly related to the infant mortality rate, the maternal mortality ratio and the population percentage not expected to survive to age 40. Figure 215 through 218 illustrate these relations.

The aggregate average of population without access to basic health services for all countries was 27.9%±22.5 and 95% confidence interval for the mean’s ranged between a lower limit of 22.8% and an upper limit of 33%. The mean was shown to differ significantly with national income category. Low income countries had an average of 35.2%±23.1, compared with 21.2±18.1 for lower middle income countries and 9.2%±11.2 for upper middle income countries.

Likewise, inaccessibility to health services was shown to differ among regions in a statistically significant manner. The regional average was estimated at 38.1%±24.0 for sub-Saharan Africa, 17%±19.3 for the Middle East and North Africa, 24.8%±18.1 for the Latin America and 18.2%±17.3 for the Asia and Pacific. The lower and upper limit of the 95% confidence interval for the mean were shown to be 29.5% and 46.8% in Sub-Saharan Africa, 5.1% and 28.3% for the Middle East and North Africa, 15.8% and 33.9% for the Latin America and 7.7% and 28.7% for the Asia and Pacific.
Figure 215. Inaccessibility to Health Services and
Disability Adjusted Life Expectancy at Birth

Figure 216. Inaccessibility to Health Services and
Infant Mortality Rate
Figure 217. Inaccessibility to Health Services and Maternal Mortality Ratio

Figure 218. Inaccessibility to Health Services and Population not Expected to Survive to Age 40
However, inaccessibility to basic health services was not shown to differ between adjusting and non-adjusting countries. The aggregate mean for adjusting countries was estimated to be 28.9%±21.7, compared with 25%±24.9 for non-adjusting countries. The 95% confidence interval for the mean was shown to have a lower limit of 23.1% and an upper limit of 34.6% in adjusting countries. This is compared with a lower and an upper limit of 13% and 37.1% in non-adjusting countries. The P-value was estimated at the insignificant level of 0.52.

Stratification by national income category revealed that there was no statically significant difference between adjusting and non-adjusting countries in all national income categories. In the low income category the mean was 34.4%±22.3 for adjusting countries and 38.4±27.1 for non-adjusting countries. In the lower middle income category the average was estimated to be 21.2%±18.3 and 21.2%±19.5 for adjusting and non-adjusting countries respectively. Adjusting upper middle income countries had an average of 13.8%±14.5, compared with 4.6%±4.1 for non-adjusting countries.

Likewise, regional stratification showed that there was no statistically significant difference between adjusting and non-adjusting countries with respect to the proportion of the population without access to basic health services in all regions. The regional average was 39.3%±21.9 versus 33.7±13.8 in Sub-Saharan Africa, 15.2%±18.2 versus 18.0%±21.5 in the Middle East and North Africa, 24.3%±17.8 versus 27.7%±24.0 in the Latin America and 16.8%±17.1 versus 23.0%±20.8 in the Asia and Pacific, for adjusting and non-adjusting countries respectively.

Figure 219. Inaccessibility to Health Services in Adjusting and Non-adjusting Countries by National Income Category

![Chart showing inaccessibility to health services in adjusting and non-adjusting countries by national income category.](image)
Figure 220. Inaccessibility to Health Services in Adjusting and Non-adjusting Countries by Region

Figure 221. Duration of Structural Adjustment Implementation and Inaccessibility to Health Services
Testing the association between the proportion of population without access to basic health services and the duration of structural adjustment implementation in years by a linear regression formula yielded statistically insignificant association. The non-parametric Spearman correlation coefficient was estimated at 0.09 and the regression $\beta$ coefficient at 0.07. Both were shown to be statistically insignificant.

**Entitlement to Basic Education**

Entitlement to basic education is assessed using the percentage of children not reaching grade 5 in 1995. Data were available for 63 countries of the 90 countries in the database. The association of this indicator with the health status indicators was shown to be statistically significant. It appeared to be inversely related to the total population DALE at birth and directly related to the infant mortality rate, the maternal mortality ratio and the percentage population not expected to survive to age 40. Figure 222 through 225 illustrate these relations.

The aggregate mean of children not reaching grade 5 in all countries was estimated at 23.7%±17.4. The minimum value of 0% was reported in the republic of Korea and the maximum value of 72% was reported in Madagascar and Chad. Twenty countries were shown to have excellent entitlement to education figures with less than 10% of the children fail to reach grade 5. These countries were Korea, Mauritius, Egypt, Jordan, Sri Lanka, Oman, Algeria, Djibouti, Sudan, Bahrain, Saudi Arabia, Cuba, Uruguay, Malaysia, Tunisia, Chile, China, Syria, Iran and Indonesia.

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**Figure 222. Children not Reaching Grade 5 and Disability Adjusted Life Expectancy at Birth**

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Figure 223. Children not Reaching Grade 5 and Infant Mortality rate

Figure 224. Children not Reaching Grade 5 and Maternal Mortality Ratio
On the other hand 19 countries were shown to have very bad entitlement to education figure with one third or more of the children fail to reach grade 5. These countries were Kenya, South Africa, Democratic Republic of Congo, Mauritania, India, Benin, Honduras, Papua New Guinea, Colombia, El Salvador, Congo, Nicaragua, Lao, Nepal, Ethiopia, Cambodia, Mozambique, Madagascar and Chad. National income category was shown to play a significant role in determining the proportion of children not reaching grade 5. The average was estimated to be 31.7%±17.2 for low income countries, 16.8%±13.8 for lower middle income countries and 10.5%±8.5 for upper middle income countries. The lower and upper limits of the 95% confidence interval were 25.7% and 37.7 in low income countries, 9.9% and 23.6% in lower middle income countries and 4.7% and 16.2% in upper middle income countries. The differences were statistically significant.

Likewise, the proportion of children not reaching grade 5 was shown to differ significantly among regions. The averages were estimated at 29.1±17.1 for sub-Saharan Africa, 7.3±5.5 for the Middle East and North Africa, 24.6±14.6 for the Latin America and 25.5±20.3 for the Asia and Pacific. The 95% confidence intervals for the means of these four regions were 22.5% - 35.7%, 3.6% - 11.0%, 15.8% - 33.5%, and 11.8% - 39.1%, respectively.
However, the statistical analysis showed that the proportion of children not reaching grade 5 did not differ between adjusting and non-adjusting countries in a statistically significant manner. Adjusting countries had a mean of 26.5%±16.5 and a 95% confidence interval for the mean of 21.4% - 31.6%. The mean for non-adjusting countries was estimated at 17.8%±18.1 and the 95% confidence interval for the mean at 9.3%±26.3.

Comparing adjusting and non-adjusting countries within each national income category yielded no statistically significant differences. Adjusting low income countries had an average of 31.9%±15.6, compared with an average of 30.9%±23.8 for non-adjusting countries in the same income category. The lower and upper limits of the 95% confidence interval were 25.7% and 38.1% in adjusting countries and 8.9% and 52.8% in non-adjusting countries. In the lower middle income category the mean were estimated to be 18.2%±15.2 for adjusting countries and 14.0%±11.2 for non-adjusting countries. The 95% confidence interval for both groups were 14.8% - 10.4% and 8.0% - 6.9% respectively. Finally, the mean for adjusting countries of the upper middle income category was 8.5%±27.8 and for non-adjusting countries 2.3%±25.7. The 95% confidence intervals in this income category were 0.9% - 31.4% for adjusting countries and 1.7% - 14.3% for non-adjusting countries.
Figure 227. Children not Reaching Grade 5 in Adjusting and Non-adjusting Countries by Region

Figure 228. Duration of Structural Adjustment Implementation and Children not Reaching Grade 5
Stratifying the statistical analysis by region showed that structural adjustment is not associated with the proportion of children not reaching grade 5 in all regions. In sub-Saharan Africa the average proportion of children not reaching grade 5 was 31.2%±14.9 in adjusting countries (95% CI, 24.0 - 38.3), compared with 24.8%±21.3 (95% CI, 8.4 - 41.2) for non-adjusting countries. The average for adjusting countries in the Middle east and North Africa was 7.8%±8.3 (95% CI, 0 - 18.1) versus 6.8%±2.2 (95% CI, 4.5 - 9.2) for non-adjusting countries in the region. In the Latin America the average was estimated at 26.5%±14.8 (95% CI, 16.6 - 36.5) for adjusting countries and 14.0%±11.3 (95% CI, 8.6 - 85.6) for non-adjusting countries. Finally, the Asia and the Pacific region showed an average of 27%±20 (95% CI, 10.2 - 43.8) for adjusting countries, compared with 21.3%±24.8 (95% CI, 4.7 - 83.1) for non-adjusting countries. The differences in the means, their standard deviations and their 95% confidence intervals were statistically insignificant.

The linear regression analysis showed that the proportion of children not reaching grade 5 was not associated with the duration of structural adjustment implementation in years. The non-parametric Spearman correlation coefficient and the regression β coefficient were estimated at the insignificant levels of 0.17 and 0.14. Figure 228 illustrates the pattern of association.

DISCUSSION AND CONCLUSION

The aim from this chapter was to ascertain whether or not structural adjustment has had negative impact on aspects of poverty and income inequalities which can have detrimental health impact. The chapter started with a review of the relation between poverty and health presenting for the four main theories that explain how poverty results in bad health and mortality. Chapter moves then to present the empirical evidence from the literature for the relation between poverty and health and the indicators usually used to monitor this relation. The literature is organized in three levels: population level studies, community level studies and individual level studies.

The second part of the chapter reviews the global and regional trends of poverty and income inequalities. Longitudinal data for regions are presented and analyzed since the 1980s and trends are related to the political and macroeconomic changes characterized basically by globalization, liberalization and structural adjustment.

The third part is a comprehensive empirical analysis of the impact of structural adjustment on a wide set of poverty indicators that are sensitive to the health status of the population. These indicators are organized in four basic domains, including the size of the economy, the levels of poverty, the distributional inequalities and entitlement to the basic services.
Before drawing a conclusion for this chapter, it is important to mention that ascertaining whether structural adjustment programs have augmented poverty and inequality is difficult to answer. Defining poverty as well as structural adjustment, for example, appeared to be very problematic and an area for criticism. (Fields, 1993, Foster et al., 1984; and Kanbur, 1987). However, a considerable body of research has been defining macro-economic components of the structural adjustment that can cause poverty and inequality. A distinction has been made between stabilization and structural components.

The stabilization component refer to the fiscal and monetary policies coupled with wage policies and devaluation and thus form part of macro economic policy. Fiscal and monetary policies deflating the economy as part of a stabilization program reduce the absorption in the economy, which lowers growth rates or even results in decline in the national income (Khan, 1990). A pathway for effect was suggested by an assumption which goes this line: If income distribution does not change, then a deflationary action, per definition, increases poverty. How much poverty increases depends not only on the amount of deflation but also on the parameters which determine the slope of the income inequality function around the cut-off point for poverty. A first approximation is therefore that stabilization policies increase poverty. However, it is difficult to maintain the assumption that income distribution remains unchanged during a process of stabilization, since the very policy instruments applied in the stabilization process change the parameters of the various sets of income distribution, such as income before tax (wages, profit, rents), income after tax and net incomes which include the imputed benefits of public services (respectively, primary, secondary and tertiary income distribution (Ndulu, 1992)).

This effect was suggested to depend not only on the nature of the policies but also on the forces which drive income inequality. These forces were described by Taylor (1988) as the social matrix and by Khan (1993) as the interface between institutional organization and policy regime of the country applying stabilization policies. Based upon an overview as part of a UN/WIDER set of studies of the stabilization experiences in the mid-1980s of 17 countries, Taylor concludes:

"The moral is that getting into and out of economic stabilizations are not processes independent of major groups in the country, their political role, and insertion in the economic system. On the whole, professional economists deal uneasily with these issues, and often carry through their analyses of economic classes and their political roles ineptly. But such factors have been vital to the successes and failures of many stabilizations "with a human face". This can only be realized on the basis of a serious analysis of the social matrix (Taylor, 1988)."

Early analysis of the effects of stabilization policies pointed to an adverse effect on the poor which was at least equal to the deflationary push and often larger (Cornia, Jolly and Stewart, 1987; van der Hoeven, 1987; PREALC, 1985). The contraction in
the economy has also frequently led to a decline in the wage share in national income, as Manuel Pastor has demonstrated (Pastor, 1987). Some authors (e.g. Sahn, 1992) argue that poor people do not take part in the formal economy and especially do not make much use of government services, and hence, are less (either negatively or positively) affected by stabilization policies than non-poor groups which used to profit much more from public services. Hence, stabilization policies and especially the fiscal contraction results in a more equal tertiary income distribution. These views are however questioned by many observers. In general it is accepted that the deflationary component of stabilization policies results in increased poverty, although the intensity depends both on the relative weight and intensity of the policies adopted as well as on the initial conditions.

The adjustment components suggested to cause poverty include devaluation of the national currency which changes the price ratio between tradeable and non-tradeable goods. Exchange rate policies are applied to stabilize the economy as well as to change production patterns and belong thus partly to stabilization measures and partly to adjustment measures. Here the key question is to what extent the poor are producers of tradeables and non-tradeables and consumers of tradeables and non-tradeables. The theory is rather agnostic. The application of the Salter-Swan type of analysis is now widespread (Sachs and Larrien, 1993; Demery and Addison, 1993). The difficulty lies with the interpretation of the theory in practice. Firstly, the definition of tradeables is not as clear as it may sound. Secondly, the production patterns and consumption patterns of the poor cannot easily be mapped on the category of tradeables and non-tradeables, as some want to lead us to believe. The complication is well explained in Jamal and Weeks (1993) and in Stewart (1995). Stewart argues that initial conditions determine whether switching policies lead to more employment and poverty, reduction or not. In the absence of growth, employment and income distribution (and thus poverty) are likely to worsen following devaluation in economies: specializing in mineral exports or agricultural products whose production is unequally distributed; where urban poverty is high in relation to rural poverty; where there is a large oligopolistic modern sector, specialized in import substituting production - this will affect urban incomes in particular.

Employment, income distribution and the poverty situation are most likely to improve where: (iv) tradeables are labour-intensive relative to non-tradeables (i.e. in economies specializing, especially at the margin, in labour-intensive manufactures or labour-intensive agriculture); rural poverty is high in relation to urban poverty, and rural incomes (and tradeable production are fairly evenly distributed.

The effect of other adjustment policies on poverty is more difficult to judge. For example, the effect of privatization on poverty or of a shrinking in the public sector employment depend very much on whether, for example, dismissed civil servants belong to poor groups or not, whether they can find other jobs, and whether the
privatization process will result in a decline in the tax burden for the poor. Also, the
effect of deregulation cannot be predicted in advance. If deregulation reduces rent-
seeking by wealthy and influential groups and this results in lower prices of products
consumed by the poor, then adjustment policies can contribute to a decline in
poverty. However, if deregulation results in the creation of natural monopolies, then
the effect of deregulation on the poor can be negative. The effects of adjustment
policies on poverty depend therefore much more on the initial social economic
setting in the country undergoing adjustment and on the type of adjustment policies
applied. The next chapter will therefore review some aspects of adjustment policies
and poverty especially in relation to some labor market issues.

Our empirical analysis which included a wide set of indicators for poverty and
inequalities does not support the assertion that structural adjustment has had
negative impact in the poverty and income inequality domain sufficient to cause
detrimental health impact. Generally, adjusting countries did not differ with respect
to 12 basic poverty and inequality indicators from non-adjusting countries. This was
held true even when the analysis was stratified by national income category and by
region. In the few cases, where there was a statistically significant difference
between the two groups, the difference was always in favor of structural adjustment.