

XX. THE DEMOGRAPHIC DIVIDEND AND POVERTY REDUCTION

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A. INTRODUCTION

The ICPD Programme of Action addresses a wide range of issues that bear on poverty reduction. This brief note focuses on the effects of fertility decline associated with improved access to reproductive health services and their quality. The note summarizes new research on the demographic dividend, shows the implications of this work for poverty reduction, and presents new analysis of how fertility decline in general and among poor groups or those at high risk of experiencing poverty will influence the achievement of the goal of cutting poverty in half by 2015.

In the decade since the 1994 International Conference on Population and Development, many countries around the world have experienced fertility decline, but many developing countries, particularly the poorest of the poor, continue to have high rates of childbearing. Countries with more than 10 per cent of their population living on less than a dollar per day have a total fertility of 4.6 children per woman as compared with 2.3 children per woman in countries with poverty levels below 10 per cent. The most impoverished countries also had high rates of child dependency, often in excess of 40 per cent (table XX.1). High fertility and high rates of child dependency also characterize the countries with the largest poverty gaps.

TABLE XX.1. POVERTY AND DEMOGRAPHIC INDICATORS, 1990-2002

	<i>Percentage of population in poverty</i>		<i>Poverty gap (percentage)</i>	
	<i><10</i>	<i>> 10</i>	<i><5</i>	<i>>5</i>
Number of countries.....	45	49	59	35
Total fertility	2.3	4.6	2.7	4.8
Percentage of population under 15	27.9	41.3	30.5	42.2

Source: World Development Indicators 2004.

NOTE: Poverty is the percentage of the population living on less than \$US 1 a day. Values presented are averages of estimates available for 1990-2002.

The correlation between demographic and poverty variables apparent in table XX.1 cannot be taken as evidence of a causal relationship, that is, reducing total fertility does not necessarily cause a reduction of poverty. There are many other factors at play and high fertility may be, in part, an outcome of poverty. The important conclusion to be drawn from table XX.1 is that implementing more effective reproductive health programmes in high fertility countries will target countries where poverty is greatest. The question at hand is whether fertility reduction is an effective measure for reducing poverty.

There are many important and contentious issues related to the number of children and poverty. Many studies have shown that incomes are lower in larger families, but as with the data displayed in table

XX.1, issues of causality make it difficult to interpret this correlation. We also know that a variety of behavioural responses mediate the financial impact of an event such as the birth of a child. Other household members may work harder, family members may help with time or financial resources, and public support may reduce the financial impact of an additional birth. Education and health may be affected adversely by family size and parents may invest less in the human capital of unwanted children. Children make financial contributions to the family at a relatively young age in some societies and are an important source of financial support in many countries.¹

Recent research, however, provides compelling evidence that fertility rates have an important bearing on poverty. This conclusion is supported both by micro- and macro-level studies. The micro-level evidence comes in a series of studies that have provided comprehensive estimates of intergenerational flows, including those to and from children (Stecklov, 1997; Lee, 2000; Lee, 2003). These studies consistently find that children are a financial burden in high fertility settings. Moreover, the financial transfers to dependent children far outweigh the financial transfers from adult children to elderly parents. The hypothesis that parents are having more children because they will benefit financially is not borne out by the facts. Children consume far more than they produce even in traditional settings. Thus, the birth of an additional child reduces the material standard of living of other family members.²

The macro-level evidence complements and reinforces the micro-level evidence by showing that per capita income grows more rapidly when the number of working-age adults is growing faster than the number of children because children are mainly consumers, not producers. At the aggregate level or at the household level a decline in the number of children per adult leads to higher per capita income for the country and the household.

Most recent research addresses the relationship between demographic factors and average income or economic growth rather than poverty *per se*. Given any distribution of income, an increase in average income will, by definition, lead to a reduction in poverty. As an empirical matter, economic growth has had an important, favourable effect on poverty reduction. But not all economic growth nor all growth policies are pro-poor. In an analysis of 21 economic growth spells in Asia during the 1990s, poverty declined in 13, was stagnant in 3, and increased in 5 (Asian Development Bank, 2004).

In light of these considerations, recent empirical work by Eastwood and Lipton is particularly salient. They show that high fertility, net of infant mortality, not only leads to slower economic growth but also skews the distribution of consumption against the poor (Eastwood and Lipton, 1999; 2001). Thus, Eastwood and Lipton's evidence suggests that reducing fertility is not only a measure that promotes economic growth but it also contributes to reduce poor.

B. THE DEMOGRAPHIC DIVIDEND AND POVERTY REDUCTION: AN AGGREGATE PERSPECTIVE

This section addresses in more detail whether policies that lead to reductions in fertility *per se* also produce a reduction of poverty. It draws on recent research on the demographic dividend to provide broad estimates of the impact on poverty of fertility decline. The analysis presented below indicates that the demographic dividend could lead to a reduction in poverty by about 14 per cent between 2000 and 2015, an important contribution to meeting the Millennium Development Goal on poverty reduction.

The demographic dividend arises, in large part, when the number of producers in the population grows more rapidly than the number of consumers. The phenomenon occurs as fertility decline yields an immediate drop in the rate of growth in the number of consumers (children), but a substantially delayed decline in the rate of growth of the number of workers. Two distinctive methods have been used to quantify the dividend. Cross-national regression models have been estimated by several scholars (Kelley

and Schmidt, 1995; 2001; and Bloom and Williamson, 1998). Direct estimates have been constructed by combining population data with estimates of age-profiles of consumption and production obtained by analyzing data at the micro-level (Cutler and others, 1990; Mason and Lee, 2004). The evidence assembled to date indicates that these two methods are statistically equivalent (Kelley and Schmidt, 2001).

The direct method has been used by Mason and Lee (2004) to estimate the demographic dividend for all countries in the world using United Nations population data (United Nations, 2000) and a standard age-profile of consumption and productivity. Thus, variation in the demographic dividend among regions and over time is related entirely to demographic variation among countries rather than differences in the age-profiles of production and consumption. Not captured by the calculations are differences in policy, institutions, or other contextual variables that influence the success with which countries exploit the opportunities created by changing age structure.

Briefly stated the analysis indicates that during the last four decades the countries of Asia and Latin America have been the main beneficiaries of the demographic dividend. Neither the least developed countries nor the countries of Africa have as yet experienced favourable demographic conditions. These differences among regions are a direct reflection of the persistence of high fertility in many of the least developed countries and in countries of sub-Saharan Africa. However, if the projected fertility declines in those regions become a reality, the demographic dividend is expected to become increasingly important in both regions during the next decades.

The results presented in table XX.2 provide crude estimates of the effect of the demographic dividend on the proportion of the population living with less than \$US 1 per day assuming that: (a) economic growth due to fertility decline is as effective at reducing poverty as other growth policies; and (b) that economic growth is equally effective at reducing poverty in all regions. The estimates are constructed using an estimate of the elasticity of poverty with respect to per capita income growth of -1.5 based on the analysis of 111 growth spells from 51 developing countries (Asian Development Bank, 2004).³ That is, it is assumed that an increase in per capita income by 1 per cent is estimated to reduce the poverty rate by 1.5 per cent.

TABLE XX.2. DEMOGRAPHIC DIVIDEND AND POVERTY REDUCTION BY MAJOR REGION, 1960-2015

	<i>Annual reduction in poverty (percentage)</i>		<i>Total reduction in poverty (percentage)</i>	
	<i>1960-2000</i>	<i>2000-2015</i>	<i>1960-2000</i>	<i>2000-2015</i>
Less developed regions.....	0.38	0.30	14.1	14.1
Least developed countries.....	-0.11	0.26	-4.6	12.3
Africa.....	-0.07	0.29	-2.8	13.5
Asia.....	0.44	0.30	16.2	13.8
Latin America and the Caribbean	0.54	0.39	19.5	17.7

NOTE: Based on an elasticity of -1.5, relating poverty based on income of less than one US dollar a day to income growth (Asian Development Bank, 2004). Estimates of the demographic dividend are based on Mason and Lee (2004).

Under these conditions, the demographic dividend would have led to a reduction of poverty by 14 per cent in the developing world between 1960 and 2000 and an additional 14 per cent between 2000 and

2015. For the least developed countries, demographic change had an adverse effect on poverty between 1960 and 2000, but between 2000 and 2015 that effect is expected to be favourable, provided fertility declines, leading to an estimated reduction in poverty of 12 per cent. The demographic effects on poverty at the level of major world regions mirror the difference in experience of less developed versus least developed countries. Demographic change did not facilitate poverty reduction in Africa between 1960 and 2000, but had very favourable effects in Asia and Latin America and the Caribbean, reducing poverty by 16.2 per cent and 19.5 per cent, respectively. During 2000-2015, however, significant reductions in poverty are anticipated in all three regions due to favourable changes in the age structure related to continued reductions of fertility.

The calculations presented in table XX.2 provide a general indication of the magnitude of the effects associated with population change and show that, for the first time, demographic conditions could be favourable throughout the developing world during the next 15 years. There are important issues, however, that are not addressed by this approach. One is that the effect of economic growth on poverty varies from region to region and from country to country or even within countries. This issue has been explored in a number of studies, with the conclusion that initial conditions matter. Poverty is more responsive to economic growth where initial income inequality is lower (Ravallion, 2004) and educational attainment is higher (Ravallion and Datt, 1999). Consistent with these observations are empirical estimates of the elasticities of poverty to income inequality and educational attainment that are somewhat higher in Asia—where income inequality has been lower and educational attainment is generally higher than elsewhere. This finding suggests that the effects shown in table XX.2 may be under-estimated for Asia and over-estimated for Latin America and the Caribbean and for Africa. A second unresolved issue is whether fertility reduction is more or less effective in reducing poverty than development is. This issue is explored in the next section.

C. A MICRO-LEVEL PERSPECTIVE: FERTILITY AND POVERTY IN INDONESIA

The demographic dividend analyzed at the aggregate level arises as a consequence of a decline in the number of children in the population relative to the number of persons in the working ages. The same phenomenon can be analyzed for individual countries using household survey data. A full accounting of the effects of fertility is a complex and elusive goal, however. A change in the number of children may influence household behaviour in many ways that will affect both current and future consumption. Unfortunately, the empirical methodology for estimating the full effects is far from obvious. Feedbacks, long-term effects, and direction of causation all enter the picture, as do institutional practices.

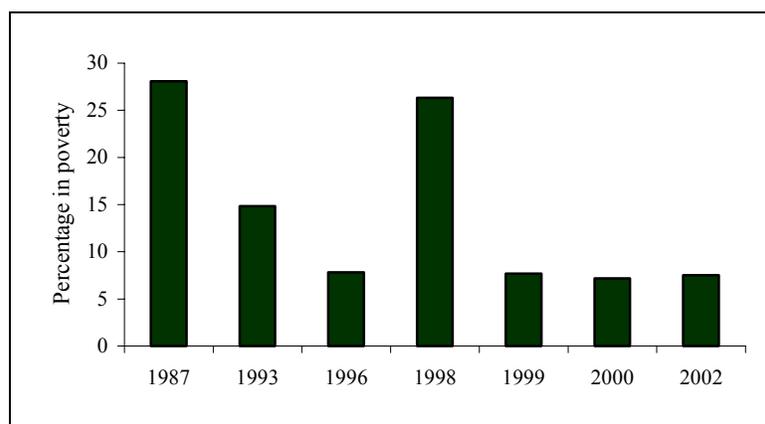
The approach that we take here is to consider only first order effects. Lower fertility leads to a decline in the number of household members. Consequently, total household income and thereby total household consumption will be directly affected because children contribute to family earnings by working. Per capita household income and consumption are affected because consumption is spread across fewer household members. The net effect on per capita consumption and the percentage of people in poverty depends on the magnitude of these two effects.

The experience of Indonesia is instructive because of its considerable success during the 1980s and early 1990s when both income grew and fertility declined at a rapid pace. By 1996 there were 3.3 children aged 0-14 for every couple aged 30-44. Currently, the total fertility in Indonesia is 2.6 births per woman. Between 1987 and 1996, the proportion of poor in Indonesia fell from 28 per cent to about 8 per cent. However, the Asian financial crisis hit Indonesia quite hard. The proportion of people living on less than a dollar a day rose to 26 per cent during the crisis, but fell fairly quickly to about 7.5 per cent by 2002 (figure XX.1).

We use a quasi-experimental approach to estimate the net direct effect of fertility decline on poverty. Using data from a household survey, we classify households with per capita expenditure of less than a dollar a day as impoverished. The poverty line is 911 *Rupiah* in 1996, calculated using the official exchange rate (2,342 *Rupiah* per dollar) and a PPP conversion factor to adjust the official exchange rate of 0.3889 per dollar.⁴ Then, we randomly select 10 per cent of the children aged 0-14. We recalculate per capita household consumption and poverty levels excluding those children from the survey, reducing total household consumption by the income of the excluded children. The experiment is repeated for sub-groups of the population: (a) female headed household; (b) households distinguished by their urban-rural residence, and (c) by the educational attainment of the head of household. This procedure allows us to assess whether fertility reduction targeted at particular sub-groups yields greater reductions in poverty.

We use the 1996 Indonesian Socio-Economic Survey (*Susenas*) and the matching Indonesian Labour Force Survey (*Sarkenas*). *Susenas* is a representative national survey which includes detailed information on household expenditure and income as well as characteristics of households and individuals. *Sarkenas* is an annual national labour force survey which contains earnings of individuals of working age. Because these two data sets share the same identification variable, it is possible to impute individual earnings from *Sarkenas* to *Susenas*. Children's income from work is defined as their earnings plus an estimated portion of the household's entrepreneurial income. The estimated effects of a 10 per cent reduction in net fertility are presented in table XX.3.

Figure XX.1. Percentage of population in poverty, Indonesia, 1993 PPP dollar-a-day measure



Source: *Susenas*, each year. Cited from *Global Poverty Monitoring*, World Bank, www.worldbank.org/research/povmonitor.

In 1996, 8.1 per cent of the population lived below the poverty line. Poverty rates were higher among female-headed households, rural households, and households whose heads had no more than a junior-high school education. Poverty-reduction programmes that *effectively* target these high poverty groups clearly have greater potential for reducing overall poverty rates.

The effect of a 10 per cent reduction in the child population is to reduce the level of poverty by to 7.2 per cent, a percentage reduction of 11 per cent. Targeted reductions in net fertility can yield substantially greater benefits in terms of the reduction of poverty. In all instances, fertility reductions in female-headed households yield greater benefits than similar reductions in all households. The gains are particularly large for female-headed households in rural areas and female-headed households where the head of household has less education. In percentage terms, the greatest gain is when fertility reductions

occur in households with educated female heads, but the original level of poverty for this group is quite low. When we carried this type of experimental estimation using data from the 2002 *Susenas*, we found that the results and patterns obtained were similar to those derived from 1996 data.

In sum, both the macro- and the micro-level analyses support a single conclusion: in high fertility societies, fertility reduction is a potentially powerful tool for reducing poverty.

TABLE XX.3. CHANGE IN THE PERCENTAGE OF POPULATION IN POVERTY ASSOCIATED WITH A 10 PER CENT DECLINE IN THE NUMBER OF CHILDREN, INDONESIA, 1996

		<i>Before</i>	<i>After</i>	<i>Change</i>	<i>Percentage change</i>
Total	All HH	8.09	7.19	-0.90	-11.12
	Female HH	9.50	6.49	-3.01	-31.68
By residence					
Urban	All HH	2.52	1.70	-0.82	-32.54
	Female HH	2.78	1.62	-1.16	-41.73
Rural	All HH	14.79	12.06	-2.73	-18.46
	Female HH	15.01	9.60	-5.41	-36.04
By education of household head					
Junior high or less	All HH	9.78	7.12	-2.66	-27.20
	Female HH	9.51	6.45	-3.06	-32.18
More than junior high	All HH	1.15	1.00	-0.15	-13.04
	Female HH	0.91	0.48	-0.43	-47.25

Source: Calculated from the 1996 *Susenas*.

NOTES

¹ Several recent reviews treat these issues extensively (Ahlburg, Kelley and others, 1996; Eastwood and Lipton 2001a; Merrick 2001).

² That children impose a financial cost does not imply that their birth reduces the welfare of parents or other family members. Children are valued for reasons other than being future workers.

³ A growth spell refers to a period for which comparable income and expenditure or poverty surveys can be used to measure economic growth and poverty or a period of three or more years.

⁴ The poverty rate is slightly higher than in the figure and in table 3 because we use the 1996 PPP measure which is somewhat higher than the 1993 PPP measure used by the World Bank.

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