"... Maternal health, we pointed out, had been particularly hard hit by macroeconomist-driven policies designed to restructure the financial outlook of ailing governments. The long-term aim was to encourage economic growth by increasing production and reducing public spending and imports, but even at SAP’s inception in the early 1980s, the devastating short-term health effects were readily predictable. Within a few years these effects became painfully obvious."

Evans Imogen

Maternal mortality is a serious global public health problem and one of the challenge encountering health systems in developing countries. The World Health Organization estimated that every day, at least 1,600 women die from the complications of pregnancy and childbirth, making an annual toll of 585,000 women. The majority of these deaths—almost 90%—occur in Asia and sub-Saharan Africa; approximately 10% in other developing regions; and less than 1% in the developed world. Between 25% and 33% of all deaths of women of reproductive age in many developing countries are the result of complications of pregnancy or childbirth.

Maternal mortality has been described as the areas where the largest discrepancy between developed and developing countries does exist. The maternal mortality figure of the developing world is almost 18 fold higher than industrialized countries. This is compared to 7 fold in infant mortality. Aside from the mortality toll, an estimated 50 million more women suffer from maternal morbidity—acute complications from pregnancy. For at least 18 million women, these morbidities are long-term and often debilitating.
Structural adjustment has been blamed to have participated in causing and worsening this misery. The most direct claim came from the editor of the prestigious “Lancet” - Evans Imogen – [1995] in an editorial entitled “Sapping Maternal Health”. Taking sub-Saharan Africa as an example, the editor specified maternal health as the area where the detrimental effects of structural adjustment have been particularly evident. The claim states:

...... we highlighted the havoc wreaked by the World Bank's structural adjustment program (SAP) on the health and welfare of people in sub-Saharan Africa. Maternal health, we pointed out, had been particularly hard hit by macroeconomist-driven policies designed to restructure the financial outlook of ailing governments. The long-term aim was to encourage economic growth by increasing production and reducing public spending and imports, but even at SAP’s inception in the early 1980s, the devastating short-term health effects were readily predictable. Within a very few years these effects became painfully obvious.

The nature of these devastations inflicted by the World Bank's adjustment policies were rather vaguely described. Furthermore, the editor drew his serious conclusion about the impact of adjustment on maternal health from a rather naive reasoning. The causal claim was based on two associations; the first was between the gross national product (GNP) and maternal mortality in developed countries and the second was between structural adjustment and GNP in Africa.

In terms of gross national product (GNP) per caput, countries fall into four categories: rich, middle-income, poor, and poorest. The gulf between the rich and the poorest was eight-fold in 1950 and is now nearly 30-fold. There were 24 countries in the poorest category in 1950 versus 47 today, of which 29 are in sub-Saharan Africa. And this is real poverty, with 62% of the sub-Saharan African population earning less than $6 per week. Viewed from Harrison's perspective of the consequences on maternal health, the Italian GNP per caput of over $20 000 translates into a lifetime risk of dying during pregnancy and childbirth of 1 in 17 360, whereas the respective figures for Mali, West Africa, are $310 and 1 in 7. A 66-fold difference in GNP manifests as a nearly 2500-fold difference in maternal death.

Thereafter, the editor answered the question whether or not, on this ground, structural adjustment can be blamed for the widening gap between Africa and industrialized countries.

Not entirely, but they must shoulder a large part of the blame. ..... SAP is prejudiced against social welfare and has thereby helped to precipitate a catastrophe in which virtually all economic, social, educational, and public health gains made in the 1960s and 1970s have been wiped out. SAP may work in countries that already have a good administrative infrastructure and high levels of literacy but not where these basic elements are lacking. Expert predictions are that, if such policies continue, it will take another 30 years to attain the living standards of 25 years ago.
Meanwhile, cuts in spending on public education—an SAP conditionality—condemn many children, especially girls, to continuing illiteracy, and women already account for two-thirds of the 1 billion illiterates in the world, mostly in Asia and Africa. Health resources—from dressings and needles to ambulance parts and vaccines—dwindle, and user fees drive people to self-treatment or quackery. The cost of an uncomplicated caesarean section in Port Harcourt is $274, or 9 months’ average salary. Those who need the operation for obstetric reasons and cannot afford to pay die. Amidst this despair, privatization—another SAP conditionality—has made a very few people very rich indeed.

This chapter examines the claim that structural adjustment lending has led to deterioration in maternal health and survival. In doing that, the chapter attempts to answer the following questions:

1) Is there a statistically significant difference between adjusting and non-adjusting countries in levels of maternal mortality,

2) Have the gains made in terms of reduction in maternal mortality rates reversed or significantly declined in adjusting countries in comparison with non-adjusting countries,

3) Have the early adjusting countries witnessed reversals or significant slowdowns in the reduction of maternal mortality rates in comparison with non-adjusting countries,

4) Have the proximate determinants of maternal mortality (such as antenatal coverage, delivery services, quality of maternal care, etc) differed significantly between adjusting and non-adjusting countries.

The chapter traces the levels and the reasons for maternal mortality in developing countries. Levels of maternal mortality are measured by the maternal mortality ration (MMR). The MMR reflects a woman’s risk of dying each time she becomes pregnant; because women in developing countries bear many children and obstetric care is poor, their lifetime risk of maternal death is much higher—almost 40 times higher than in the developed world.

The WHO identified basic medical care during pregnancy, childbirth and the postpartum period as the most important determinant of maternal mortality. For example, only 53% of the 60 million deliveries that take place each year in developing countries are attended by a skilled birth attendant (a doctor or midwife). Furthermore, less than 30% receives postpartum care. These are the period where the majority of maternal deaths occur.
Maternal Mortality Ratio

The mean maternal mortality ratio in adjusting countries was estimated to be 568 (±433) per 100,000 live birth, compared with 500 (±511) in non-adjusting countries. The difference in the MMR was statistically insignificant. These aggregate means hide, however, great disparities among countries. For example, the lowest MMR in non-adjusting countries was reported in Bahrain and averaged around 46. Chad and Angola reported the maximal MMR among non-adjusting countries, which was 30 folds higher than Bahrain (1500 per 100,000 live birth). Similarly, the minimum MMR in adjusting countries was reported in Cape Verde and Panama to be 55 per 100,000 live birth. This compared to a MMR of 1600 in Guinea.

Figure 44 shows that there was a significant difference between the mean of MMR in different country income group. The MMR was estimated to be 846 in low income countries, compared with 221 in lower middle income countries and 148 in upper middle income countries. Within each income category structural adjustment did not appear to have an influence on maternal mortality. Within the low income category, adjusting countries reported a mean MMR of 809, compared with 971 in non-adjusting countries. For the lower middle income category, the mean MMR was 219 in adjusting countries and 228 in non-adjusting countries. Finally, the upper middle income countries reported a MMR of Maternal mortality did not change differently Structural adjustment did not appear to influence the levels 162 in adjusting countries and 136 in non-adjusting countries. None of the difference was statistically significant.

Figure 44. Maternal Mortality Ratio in Adjusting and Non-adjusting Countries by National Income Category

<table>
<thead>
<tr>
<th>Country income category</th>
<th>MMR per 100,000 live births in 1995</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>2000</td>
</tr>
<tr>
<td>Lower Middle</td>
<td>1800</td>
</tr>
<tr>
<td>Upper Middle</td>
<td>1600</td>
</tr>
<tr>
<td></td>
<td>1400</td>
</tr>
<tr>
<td></td>
<td>1200</td>
</tr>
<tr>
<td></td>
<td>1000</td>
</tr>
<tr>
<td></td>
<td>800</td>
</tr>
<tr>
<td></td>
<td>600</td>
</tr>
<tr>
<td></td>
<td>400</td>
</tr>
<tr>
<td></td>
<td>200</td>
</tr>
<tr>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Country income category</th>
<th>non-adjusting</th>
<th>adjusting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>2000</td>
<td>0</td>
</tr>
<tr>
<td>Lower Middle</td>
<td>1800</td>
<td>0</td>
</tr>
<tr>
<td>Upper Middle</td>
<td>1600</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Country income category</th>
<th>Non-adjusting</th>
<th>Adjusting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>2000</td>
<td>0</td>
</tr>
<tr>
<td>Lower Middle</td>
<td>1800</td>
<td>0</td>
</tr>
<tr>
<td>Upper Middle</td>
<td>1600</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Country income category</th>
<th>non-adjusting</th>
<th>adjusting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>2000</td>
<td>0</td>
</tr>
<tr>
<td>Lower Middle</td>
<td>1800</td>
<td>0</td>
</tr>
<tr>
<td>Upper Middle</td>
<td>1600</td>
<td>0</td>
</tr>
</tbody>
</table>
Maternal mortality appeared to differ significantly by region. The mean of MMR in sub-Saharan Africa was 848 per 100,000 live birth. This was three times higher than the Middle East and North Africa, four times higher than the Latin and Middle America and twice higher than Asia and Pacific. The average figure of maternal mortality for these regions were 325, 210 and 454 per 100,000 live birth, respectively. Again, adjusting and non-adjusting countries did not appear to differ in statistically significant manner with respect to maternal mortality. In sub-Saharan Africa, the mean MMR was 870 in adjusting countries and 784 in non-adjusting countries. Adjusting countries of the Middle East and North Africa reported a MMR of 267, compared with 368 for non-adjusting countries. The figures in Latin and Middle America were 177 in adjusting countries and 353 in non-adjusting countries. Finally, the Adjusting countries in Asia had a mean MMR of 542, compared with 261 for non-adjusting countries. All these differences were statistically insignificant.

Figures 46 through 49 illustrate the relationship between the maternal mortality ratio and the duration of structural adjustment in different regions. In sub-Saharan Africa the maternal mortality ratio did not appear to differ with the duration of structural adjustment. For example, countries that have embarked on structural adjustment since the 1980s (10 years or more) have shown disparities of the same magnitude of late implementers.
The MMR in countries that implemented the adjustment programs for longer than 10 years were 490 in Madagascar, 500 in Gabon, 550 in Cameroon, 560 in Malawi, 610 in Lesotho, 640 in Togo, 650 in Kenya, 740 in Ghana, 770 in Tanzania, 810 in Côte d’Ivoire, 910 in Guinea-Bissau, 930 in Mauritania, 940 in Zambia, 1000 in Nigeria, 1100 in Gambia, 1200 in Uganda, 1200 in Senegal, 1300 in Burundi, 1500 in Mozambique and 1600 in Guinea.

Adjusting countries for less than 10 years showed MMR of 55 in Cape Verde, 500 in Comoros, 570 in Zimbabwe, 700 in CAR, 890 in Congo, 930 in Burkina Faso, 990 in Benin, 1200 in Mali and 1400 in Ethiopia. Non-adjusting countries, which were not exposed to the adjustment policies had MMR of 120 in Mauritius, 230 in South Africa, 250 in Botswana, 370 in Namibia, 400 in Djibouti, 870 in Congo DR, 1200 in Niger, 1400 in Eritrea, 1500 in Angola and 1500 in Chad.

Countries of the Middle East and North Africa showed that performance on maternal mortality does not seem to be related to the duration of structural adjustment. Countries which were not exposed to structural adjustment showed a difference of more than 1300 per 100,000 live birth between Yemen and Bahrain. The MMR in these two countries was 1400 and 46, respectively. The MMR in other non-adjusting countries was 120 in Iran, 130 in Saudi Arabia, 180 in Syria, 190 in Oman, 220 in Libya and 660 in Sudan. Adjusting countries of the region had MMR of 160 in Algeria, 170 in Egypt, 150 in Jordan, 170 in Tunisia, 340 in Pakistan and 610 in Morocco.

**Figure 46. Maternal Mortality Ratio and the Duration of Structural Adjustment Implementation in Sub-Saharan Africa**
Figure 48 show maternal mortality by duration of structural adjustment in Latin and Middle America. The data do not reflect any pattern of statistical significance. The MMR countries not exposed to structural adjustment ranged from 95 per 100,000 live birth in Cuba to 1000 per 100,000 live birth in Haiti. Venezuela and Guatemala had MMRs of 120 and 200 per 100,000 live birth, respectively. In early implementing countries (>10 years) the MMR ranged from 56 in Chile to 650 in Bolivia. The MMR in other early implementing countries was 60 in Costa Rica, 150 in Ecuador, 110 in Mexico and 180 in Guyana. Late implementing countries (< 10 years) had MMRs ranging from 55 in Panama to 300 in El Salvador. In other late implementing countries the MMR was 85 in Uruguay, 100 in Argentina, 100 in Colombia, 160 in Nicaragua, 160 in Paraguay, 220 in Honduras, 220 in Brazil and 280 in Peru.
Figure 48. Maternal Mortality Ratio and the Duration of Structural Adjustment Implementation in Latin America

Figure 49. Maternal Mortality Ratio and the Duration of Structural Adjustment Implementation in Asia and Pacific
The Proximate Determinants of Maternal Mortality

The following sections examine the levels of important proximate determinants of maternal mortality in adjusting and non-adjusting countries. It has been established that women's disproportionate poverty, low social status, and reproductive role expose them to high health risks and preventable death.

Access to Maternal Health Care

Access to health care has been the strongest determinant of maternal mortality worldwide. Although pregnancy poses additional risks to maternal health and survival, the majority of these risks can be managed if medical care is timely thought. Most of the maternal deaths in developing countries occur, however, because women often lack access to relevant information, trained providers and supplies, emergency transport, and other essential services. Furthermore, cultural attitudes and practices may impede women's use of services that are available. Decisions about whether to seek care are generally not the woman's alone, but are often made by the husband or mother-in-law (Thaddeus and Maine 1990; Huque and Koblinsky 1991).

Most pregnant women in the developing world receive insufficient or no prenatal care and deliver without help from appropriately trained health care providers. Only about half of the married women of reproductive age in the developing world practice contraception. In some countries in Africa, family planning and maternity care coverage is less than 10 percent (WHO 1992). Even in countries with relatively well-developed health systems, preventable maternal morbidity and mortality persist.

Access to maternal health care is examined here using four indicators: 1) proportion of births attended by a trained health worker, 2) overall access to health care, 3) supply of doctors per 1000 population, and 4) supply of nurses per 1000 population.

The percentage of births assisted by a skilled attendant is a strong indicator for maternal health care and there is evidence of its strong association with levels of maternal mortality (20,21). There is a clear clinical justification for the presence of a skilled attendant at delivery, as this may reduce both the incidence of complications and case fatality (22).

Unequivocal epidemiological evidence for the impact of skilled attendants at delivery on reducing maternal mortality is lacking. The evidence in favor of a causal link is, for the moment, largely circumstantial. Moreover, the apparent simplicity of
the indicator tends to obscure the complex reality of care during childbirth. There are large differences in the skills, equipment, and supplies needed for the appropriate care and management of normal compared with complicated deliveries. Graham, Bell, & Bullough have shown that the correlation between maternal mortality reduction and assistance of a killed attendant appear to be stronger when the attendant are doctor rather than nurses or midwives (23), a finding that could be a reflection of better access to essential obstetric care services.

Despite these concerns, the skilled-attendant indicator has a number of advantages for monitoring purposes, including the fact that data are widely available for developing countries. Currently, the source of the information is generally the Demographic and Health Surveys (DHS), PAPCHILD, or Reproductive Health Surveys. These use a standardized methodology and sampling framework and have strict criteria regarding the maintenance of data quality, thus enhancing the comparability of data between countries and over time. The DHS, PAPCHILD, and Reproductive Health Surveys subdivide birth attendants into doctors, nurses, midwives, or nurse-midwives, and trained traditional birth attendants.

The latter initially acquire their ability either by delivering babies themselves or through apprenticeship to other traditional birth attendants, undergo subsequent extensive training, and are then integrated in the formal health care system. The remaining category comprise relatives, untrained traditional birth attendants, and no assistance. For these calculations, only doctor and nurses, midwives, and nurse-midwives who have the necessary midwifery skills are classified as skilled attendants.

Figure 50. Birth Attendance and Maternal Mortality in Adjusting and Non-adjusting Countries
Figure 50 shows that birth attendance has a direct inverse linear relationship with maternal mortality ratio. It indicates that the more the proportion of births attended by a trained health care worker is, the less is the maternal mortality ratio. This finding is constant in both adjusting and non-adjusting countries. In other terms, structural adjustment does appear to play an augmenting role to the lack of health care at delivery.

The proportion of women attended by a trained health care worker was 56% (±25) in adjusting countries and 64% (±30) in non-adjusting countries. The difference was statistically insignificant. Though the coverage of birth attendance differed significantly among regions, it did not differ (with the exception of Latin and Middle America) between adjusting and non-adjusting countries in each region. The average coverage of birth attendance was 45% in Africa, 65% in the Middle East and North Africa, 75% in Latin and Middle America and 63% in Asia, respectively. The figures for adjusting and non-adjusting countries in these regions were 43% and 52% in Africa, 56% and 71% in the Middle East and North Africa, 80% and 53% in Latin and Middle America and 52% and 84% in Asia. The difference was statistically significant in Latin America.
Overall access to health care does not seem to be a sensitive indicator of women access to the health system. A linear relation between availability of health care and maternal mortality could not be established. This goes in line with the international experience that even where health care facilities with capabilities managing maternal conditions are easily accessible, women may not use them at all or may not use them in timely manner. In Zimbabwe, it was revealed that delay in the decision to seek care contributed to 32 percent of deaths in rural areas and 28 percent of those in urban areas (Fawcus et al. 1996).

Furthermore, women's status in the immediate and extended family generally underlies and shapes the decision to seek care (PMM 1992). Many studies show that women cannot and do not decide on their own to seek care; the decision belongs to a spouse or senior members of the family. In a survey in six Senegalese regions, 52 percent of the respondents said the decision would be made by the husband and 44 percent said another family member would make the decision (Dia et al. 1989).

Other factors influencing decision making under emergency conditions include perceived severity of the complication. Pregnancy and delivery are regarded as natural processes and signs and symptoms of complications are not always recognized as reasons for concern. For example, focus group studies in Sokoto and Zaria, Nigeria, and Bo, Sierra Leone, showed that prolonged labor was not considered a complication and reason to seek care until two to five days had elapsed (PMM 1992). Failure to recognize the severity of symptoms also was cited as a major reason for delay in seeking care in the Zimbabwe study (Fawcus et al 1996).

A cultural factor that hinder seeking care for fatal maternal conditions is the societal expectations, which interfere with the use of health services in emergency conditions. Delivery at home remains one way for women to achieve status. For example, a woman who has to go to a hospital for delivery is thought to have failed in her essential role as a woman and is stigmatized (PMM 1992). In Benin, women of the Bariba tribe are expected to be stoic during labor and delivery, and the woman who manages to deliver without calling for assistance is especially esteemed (Sargent 1985).

Culture and tradition have great influence on the decision to seek care and, therefore, on maternal morbidity and mortality. For example, in many African settings, women's use of health facilities may be restricted by the necessity for privacy and/or the custom that a male relative must accompany them while traveling. For Saudi Arabian women, the requirement that care must be given by a woman has hindered the use of health care services.

These factors refute the claim that structural adjustment have worsened maternal mortality in adjusting countries via reducing the access and utilization of maternal health care. This conclusion finds support in our finding that the proportion of
population without access to health care does not differ between adjusting and non-adjusting countries. The mean proportion of population without access to health care in adjusting countries was 34% (±20), compared with 32% (±25) in non-adjusting countries. The difference was statistically insignificantly. Even when the means were compared within regions, the difference remained statistically insignificant. The figures (for adjusting and non-adjusting countries, respectively) were 47% (±15) and 40% (±31) in Africa, 17% (±13) and 20% (±18) in the Middle East and North Africa, 23% (±13) and 29% (±24) in Latin and Middle America, and 29% (±22) and 39% (±20) in Asia and Pacific.

The supply of doctors and nurses had a strong inverse relationship with maternal mortality. Figure 52 and 53 illustrate this relation and shows that the MMR drops dramatically with the increase of supply of doctors and nurses per 100,000 population. The supply of doctors and nurses showed disparities between adjusting and non-adjusting countries. Adjusting countries showed a significantly lower supply figures of doctors and nurses than non-adjusting countries. This was true for both the global but not the regional estimates. The global estimates show indicate that the supply of doctors and nurses was estimated to be 57 and 70 in adjusting countries, respectively. The figures for non-adjusting countries were 86 and 179, respectively. The difference in the supply of nurses was statistically significant.

Figure 52. Supply of Doctors and Maternal Mortality in Adjusting and Non-adjusting Countries

![Graph showing supply of doctors and maternal mortality in adjusting and non-adjusting countries](image-url)
The regional estimates revealed that the difference is concentrated in sub-Saharan Africa. The doctor supply in adjusting countries was 11 (±8) per 100,000 population, compared with 27 (±32) in non-adjusting countries. The supply of nurses for the region was 42 (±38) in adjusting countries and 104 (±101) in non-adjusting countries. The average supply for all sub-Saharan Africa including adjusting and non-adjusting countries was 15 doctors and 53 nurses per 100,000 population. The differences were statistically significant.

The Middle East and North Africa average supply was 90 doctors and 206 nurses per 100,000 population. The supply in adjusting countries in the region was 99 doctor and 171 nurses per 100,000 population. This is compared with an average supply of 83 doctors and 232 nurses in non-adjusting countries. The differences in supply between adjusting and non-adjusting countries were statistically insignificant.

The supply in Latin and Middle America was estimated to be 128 doctor and 83 nurses per 100,000 population. This indicates severe shortage in the supply of nurses in the region. Adjusting countries of the region have 109 (SD 75) doctor and 50 (±26) nurses per 100,000 population. The supply in non-adjusting countries was 204 (SD 221) doctors and 218 (SD 357) nurses per 100,000 population. The difference was statistically insignificant.
The Asian and Pacific countries have an average supply of 59 (σ=73) doctors and 124 (σ=121) nurses per 100,000 population. The figures for adjusting countries were 55 (σ=83) doctors and 124 (σ=140) nurses per 100,000 population. Non-adjusting countries supply average around 72 (σ=38) doctors and 128 (σ=37) nurses per 100,000 population. The differences between adjusting and non-adjusting countries were statistically insignificant.

**Poverty and Inequalities**

Poverty has been proven to underlie the poor health status of developing country populations, and women represent a disproportionate share of the poor. Furthermore, the cultural and socio-economic environment affects women’s exposure to disease and injury, their diet, their access to and use of health services, and the manifestations and consequences of disease. Two indicators were used to assess the relationship between poverty and maternal mortality. The first is the human development index (HDI) and the second is the proportion of women’s share in earned income. Figure 54 shows the linear relationship between the human poverty index HPI and maternal mortality ratio.

In all regions maternal mortality continues to be worst among countries with higher levels of poverty. Women in the poorest countries tend to have much higher fertility rates than those in the wealthiest-and far fewer births in the presence of skilled health professionals, contributing to higher maternal mortality ratios. Furthermore, women’s disadvantaged social position, which is often related to the economic value placed on familial roles, helps perpetuate poor health, inadequate diet, early and frequent pregnancy, and a continued cycle of poverty. For example, women in many parts of the world receive medical treatment less often when sick, and then only at a more advanced stage of disease. In countries where women are less educated and have less control over decision-making and family resources, they are also less apt to recognize health problems or to seek care. Restrictions in some South Asian and Middle Eastern countries on women traveling alone, or being treated by male health care providers, inhibit their use of health services.

While the relation between the HPI and women’s share of earned income with maternal mortality ratio, the values of these indicators were not significantly different in adjusting and non-adjusting countries. The HPI average value for adjusting countries was 30.8, compared with 31.9 for non-adjusting countries. When the HPI was broken down by region, it revealed statistical insignificant differences as well. In sub-Saharan Africa the HPI average was 41.9 in adjusting countries and 34.5 in non-adjusting countries. In the Middle East and North Africa the HPI was 31.1 for both adjusting and non-adjusting countries. In Asia and pacific the HPI was 26.2 in adjusting countries and 27.7 in non-adjusting countries.
The difference was only statistically significant in Latin and Middle America. However, the difference were in favour of adjusting countries. The HPI average for adjusting countries was 15.3, less than half the 36.9 average of non-adjusting countries.

With respect to the share of women in earned income, adjusting countries have better figures than non-adjusting countries. The average share of women in adjusting countries was estimated to be 32.5%, compared with 29.1% in non-adjusting countries. The difference was, however, statistically insignificant.

Regional comparisons of the share of women in earned income in adjusting and non-adjusting countries revealed insignificant differences but in the Middle East and North Africa. The difference was again in favor of the adjusting countries. In this region, the share of women in the earned income was estimated to be 23%, compared with only 17% in non-adjusting countries. Sub-Saharan Africa, the region where structural adjustment has been blamed to have caused women poverty revealed, though insignificant, higher share of women in earned income in adjusting countries than non-adjusting countries. The figures were 37% and 35%, respectively. In Latin and Middle America, women had a share of 27% in adjusting countries and 29% in non-adjusting countries. In Asia and Pacific, the share of
women in earned income was 33% and 38% in adjusting and non-adjusting countries, respectively.

Figure 55. Women's Share in Earned Income and Maternal Mortality in Adjusting and Non-adjusting Countries

Figure 56. Anemia in Pregnancy and Maternal Mortality in Adjusting and Non-adjusting Countries
An estimated 450 million adult women in developing countries are stunted as a result of protein-energy malnutrition during childhood, and underweight is a common problem among women in developing countries. More than 50 percent are anemic and about 250 million women suffer the effects of iodine deficiency, and, although the exact numbers are unknown, millions are probably blind due to vitamin A deficiency. The highest levels of malnutrition among women are found in South Asia, where about 60 percent of women suffer from iron deficiency anemia. This proportion rises to 80 percent among pregnant women in India. Studies in India, Bangladesh and Pakistan have shown chronic energy deficiency in nearly 70 percent of women. In Africa, between 20-40 percent of women are malnourished, depending upon whether there has been a catastrophe, war, famine, or drought. The correlation between maternal mortality and the proportion of pregnant women with anemia is shown in figure 56.

The proportion of pregnant women with anemia is a strong predictor of maternal mortality because of the strong association between both variables. The average prevalence of anemia among pregnant women was 48.8% (*18.8) in adjusting countries and 43.6% (*13.9) in non-adjusting countries. The difference was statistically insignificant.

Regional revealed that anemia in pregnancy is endemic in all regions. The average prevalence of anemia in pregnant women was 48.1% in sub-Saharan Africa, 46.5% in the Middle East and North Africa, 37.7% in Latin and Middle America and 58.7% in Asia and Pacific. When adjusting and non-adjusting countries were compared in each region, the comparison did not reveal statistically significant differences. The figures were 47.3% and 57% in sub-Saharan Africa, 56.5% and 36.5% in the Middle East and North Africa, 34.8% and 52% in Latin and Middle America and 63.2% and 41% in Asia and Pacific, for adjusting and non-adjusting countries respectively.

**Female Education and Fertility**

Female illiteracy has been suggested to be one of the strongest proximate determinants of maternal mortality. It can serve therefore to be an early warning sign for the detrimental impact of structural adjustment on maternal mortality. To assess the educational attainment of women in adjusting and non-adjusting countries we selected two indicators. The first is the gross primary-, and secondary enrollment ratio. The second is the years of education for female under 25 year age. Figure 57 and 58 show the linear relation between these two indicator and maternal mortality.
Comparing the indicators of female education between adjusting and non-adjusting countries revealed no statistically significant differences. For example, the gross enrolment ratio for female was 50.5% (*22.7) in adjusting countries and 53.5% (*19.6) in non-adjusting countries. The average years of education for females under 25 years age was 3.3 (*2.2) in adjusting countries and 3.0 (*1.8) in non-adjusting countries.

Breaking these figures by region revealed no statistically significant differences except for the combined gross enrolment ratio in Latin and Middle America. The difference was however in favor of adjusting countries. The combined gross enrolment ratio in the adjusting countries of Latin and Middle America was 69% (*6.2), compared with 51.3% (*19.9) in non-adjusting countries. In other regions, the combined gross enrolment ratios for adjusting and non-adjusting countries were respectively 37.4% and 45.9% in sub-Saharan Africa, 54.2% and 57.9% in the Middle East and North Africa, and 54.3% and 61.6% in Asia and Pacific.

Figure 57. Gross Enrolment Ratio and Maternal Mortality in Adjusting and Non-adjusting Countries
The regional figures for the average years for females under 25 years age in adjusting and non-adjusting countries were 1.6 and 2.6 years for sub-Saharan Africa, 2.2 and 2.5 years for the Middle East and North Africa, 5.0 and 3.7 years for Latin and Middle America, and 3.6 and 3.9 years for Asia and Pacific.

The relationship between maternal illiteracy and maternal mortality on one side and between maternal education and maternal health can be mediated through several pathways. For example, more educated women marry later. In Africa, women with seven or more years of schooling tend to marry five years later than do women with no schooling; the differential is about three years in Latin America and Asia. The effect of female education on the age when a woman's child-bearing begins is not uniform across Africa, but it is of growing importance in such countries as Kenya and Ghana, where overall fertility levels may soon begin to decline.

The countervailing effects of decreased breast-feeding on fertility as mother's education increases may remove a month or so from the interbirth intervals of the most educated mothers (related to breast-feeding seven to eight months less). The much greater prevalence of contraception among the more educated women more than fully compensates in its impact on fertility for this shorter duration of breast-feeding.

Total fertility rates are lower for women with seven or more years of schooling compared to those with no schooling. The differences by women's education are
larger in Latin America, than in Africa or Asia, but they are relatively uniform regardless of fertility measure. If one holds constant for marital status, or essentially age at first marriage, (marital) fertility differences by education are about a third less than differences in total fertility in Africa and Asia, but they are only 20 percent less in Latin America, where overall contraceptive prevalence is high but varies greatly by woman's education.

Furthermore, education affects fertility preferences, most notably, women's desired family size. Desired fertility also falls monotonically with a woman's education. Subtracting the desired fertility from the current total fertility suggests that the potential for increased contraception to reduce fertility toward desired levels is concentrated among women in Latin America with less than four years of schooling and in Asia among women with less than seven years of schooling. Among the better educated women, total fertility rates are already approaching desired fertility levels. This reflects of the fact that women's education substitutes for family planning by helping women reach their desired reproductive goals (Schultz 1989).

Other studies also indicate that women's education helps couples to avoid exceeding their reproductive goals. This is partially achieved by delaying marriage (Cochrane 1979), but more educated wives also have fewer unwanted conceptions and births in marriage (Rosenzweig and Schultz 1985 and 1987). Although the husband's education may also enhance the effectiveness of contraception, the wife's education has at least as strong an effect on these forms of reproductive behavior, whether inferred from a respondent's own classification of conceptions as unplanned or derived from econometric analyses of the reproduction function and its residual (Rosenzweig and Schultz 1985, 1987, and 1989). Reduced fertility may be another sphere of nonmarket production in which the education of women generates an important beneficial social externality.

Although fertility during a woman's lifetime appears to decrease as her education increases, in some cases the fertility of unschooled women is slightly lower than that of women with one to three years of schooling. This occasional reversal in fertility differentials by women's schooling has two interpretations. Easterlin (1975) proposed a framework for describing the demographic transition that accommodates the tendency for birth rates to increase at the outset of modern economic growth before birth rates begin their secular decline. This early rise in fertility has been attributed to improved maternal health and decreased breastfeeding, both thought to increase reproductive potential before contraception was available and widely used. The rise in fertility among women with a few years of schooling could, therefore, be attributed to the enhanced reproductive potential of women who receive only a couple years of schooling (Cochrane 1979 and 1988).

The second explanation for this occasional reversal in the fertility differential associated with a few years of women's schooling relies on the household economic model of fertility. Economic models of family decisionmaking focus attention on the potentially different signs of the effects of men's and women's schooling (or value of time) on their demands for children and hence lifetime completed fertility.
(Schultz 1981). These differences in wage effects on fertility, by source, follow from the customary tendency for women to spend more time in child care activities than do men. This economic household demand model of fertility helps to account for the observed tendency in multivariate analyses for female education (or wages) to be inversely related to fertility, while male education (or wages), land or asset income, and child wages are all directly related to fertility, at least in a traditional agrarian society (Schultz 1973). At a later stage in the development process, the fertility effect of male education (wages) may also become negative because the parents invest more heavily in the schooling of their children.

The relation between fertility and maternal mortality in adjusting and non-adjusting countries is shown in figure. Comparing the total fertility rate (TFR) between adjusting and non-adjusting countries revealed statistically insignificant differences. The TFR was 4.5 (*1.6) in adjusting countries and 4.7 (*1.7) in non-adjusting countries. Furthermore, the differences of between the TFR in adjusting and non-adjusting countries in each region were statistically insignificant. The adjusting and non-adjusting countries' TFR were respectively 5.9 and 5.4 in sub-Saharan Africa, 4.1 and 5.6 in the Middle East and North Africa, 3.3 and 3.2 in Latin and Middle America, and 3.4 and 3.5 in Asia and Pacific.

Conclusion

In this chapter the claim that structural adjustment has had detrimental impact on maternal survival was examined. The chapter started by comparing the maternal mortality ratio between adjusting and non-adjusting countries. The statistical analysis was stratified by region and by country income category. Then, indicators for three proxy domains for maternal mortality were compared among adjusting and non-adjusting countries. These domains were 1) access to maternal health care, 2) female poverty and income inequalities, and 3) female education and fertility. The indicators for these domains were 1) the proportion of deliveries attended by a trained health care worker, 2) overall access to health care, 3) the supply of doctors per 100,000 population, 4) the supply of nurses per 100,000 population, 5) the human poverty index, 6) women’s share of earned income, 7) the female combined primary- and secondary-enrolment ratio, and 8) the total fertility rate.

The statistical analysis refuted the claim because of the following reason:

1) the levels of the maternal mortality expressed by the maternal mortality ratio did not differ between adjusting and non-adjusting countries in a statistically significant manner, even after statistically adjusting for the region and the country income category,
2) The levels of maternal mortality did not appear to differ with the duration of implementation of structural adjustment policies in a statistically significant manner,

3) The 7 indicators of the three proximate determinants of maternal mortality did not generally differ between adjusting and non-adjusting country in a statistically significant manner.

4) Whenever, a statistically significant difference was revealed, it was in favor of the adjusting countries.

The maternal mortality ratio and the indicators for its proximate determinants differed significantly by region and by country income groups. However, within the individual region or the income group, there was no statistically significant difference between adjusting countries.