5 Human development issues and policies

This chapter looks at the four main areas of human development—education, health, nutrition and fertility—and at the links between them. In each, it considers the causes and effects of poverty and various ways of breaking its grip on the poor and their children.

Ten years ago this chapter would have been written very differently. In certain areas thinking has changed substantially—for instance, about the nature of malnutrition and its causes. Good progress has been made in unraveling some complex and highly controversial issues—for example, the respective roles of family planning and social development in reducing fertility. And in all areas, research and practical experience have improved understanding of the nature of poverty and what can be done about it.

Education

Every individual is born with a collection of abilities and talents. Education, in its many forms, has the potential to help fulfill and apply them.

In some societies the economic function of schooling is regarded as minor—since the cultivation of the mind and the spirit, curiosity, contemplation and reasoning have more than economic purposes and justifications. But in the context of this Report, it is the role of education in overcoming poverty—increasing incomes, improving health and nutrition, reducing family size—that receives most attention.

A decade or two ago, there was a widespread view that trained people were the key to development. Universal literacy was a political objective in many countries, but money spent on primary schooling was often regarded as diverted from activities that would have contributed more to economic growth. Planners favored the kinds of secondary and higher education that directly met the “manpower requirements” of the modern sector. People who worked with their hands were thought not to have much need of formal education.

Over the past decade, views have changed substantially. Adequate provision of secondary and higher education and training remains an important priority. But the value of general education at the primary level is now more widely recognized. This section discusses more of the evidence that lies behind this change in views, and its implications for development strategy.

Recent progress

The major educational progress of the past two decades reflects heavy investment by developing countries. Their total public expenditure on education rose in real terms (in 1976 dollars) from about $9 billion in 1960 (2.4 percent of their collective GNP) to $38 billion in 1976 (4.0 percent of GNP). Costs vary widely by region—and by type of education (see Table 5.1). The potential for continued enrollment growth at different levels will, of course, be strongly affected by these costs.

But school attendance in some parts of the world remains low, especially among the poor, in rural areas and by girls (see Figure 5.1 and Table 5.2). This is not simply because schools are unavailable—not everyone who has an opportunity for education accepts it. Among those who do enroll, moreover, in developing countries on

<table>
<thead>
<tr>
<th>Region</th>
<th>Higher (post-secondary) education</th>
<th>Elementary education</th>
<th>Ratio of higher to elementary education</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sub-Saharan Africa</td>
<td>3,819</td>
<td>38</td>
<td>100.5</td>
</tr>
<tr>
<td>South Asia</td>
<td>117</td>
<td>13</td>
<td>9.0</td>
</tr>
<tr>
<td>East Asia</td>
<td>471</td>
<td>54</td>
<td>8.7</td>
</tr>
<tr>
<td>Middle East and North Africa</td>
<td>3,106</td>
<td>181</td>
<td>17.2</td>
</tr>
<tr>
<td>Latin America and Caribbean</td>
<td>733</td>
<td>91</td>
<td>8.1</td>
</tr>
<tr>
<td>Industrialized</td>
<td>2,278</td>
<td>1,157</td>
<td>2.0</td>
</tr>
<tr>
<td>USSR and Eastern Europe</td>
<td>957</td>
<td>539</td>
<td>1.8</td>
</tr>
</tbody>
</table>

Note: Figures shown are averages (weighted by enrollment) of costs (in 1976 dollars) in the countries in each region for which data were available.
average 40 percent drop out before the fourth year. In Brazil's poor rural Northeast region in 1974, despite an enrollment rate of 46 percent (less than half the national urban average), nearly two-thirds of the students dropped out before the second year—and it is estimated that at most 4 percent completed four years. Even the completion statistics conceal the very low quality of some of the schooling provided (see pages 52–53).

Nonetheless, the very substantial growth in enrollment (Figure 5.1) is a sign of great educational advance. There are several mechanisms through which this has contributed to growth in incomes.

Effects of education on earning power

Schooling imparts specific knowledge and develops general reasoning skills (its "cognitive" effects); it also induces changes in beliefs and values, and in attitudes toward work and society ("noncognitive" effects). The relative importance of these effects is much debated, but poorly understood; both are extremely important.

In the cognitive area, developing a generalized capacity for thinking and learning has to be found to be more important than the specific subjects learned. On-the-job training, informal education and vocational training all build on learning abilities acquired earlier. And although literacy and numeracy deteriorate if left unused, the educational experience still generally provides an improved foundation for subsequent learning.

Many of the noncognitive effects of schooling—receptivity to new ideas, competitiveness, and willingness to accept discipline—are directly relevant to productive economic activity. Others—tolerance, self-confidence, social and civic responsibility—are more personal or political in nature, but may also affect economic performance.

Some of the evidence on the effects of education rests on attempts to measure attitudes directly. Studies in several countries have shown that "modernity" of outlook toward activities ranging from voting to family planning, saving and

---

### Table 5.2  Primary school enrollment, by income group

<table>
<thead>
<tr>
<th>Country</th>
<th>Poorest households</th>
<th>Richest households</th>
<th>Poorest households</th>
<th>Richest households</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Boys (aged 5–9)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sri Lanka, 1969–70</td>
<td>70.3</td>
<td>89.8</td>
<td>65.8</td>
<td>81.9</td>
</tr>
<tr>
<td>Nepal, 1973–74</td>
<td>29.5</td>
<td>77.8</td>
<td>15.3</td>
<td>71.2</td>
</tr>
<tr>
<td>11 towns</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>India: Gujarat state, 1972–73</td>
<td>22.7</td>
<td>53.9</td>
<td>8.6</td>
<td>50.9</td>
</tr>
<tr>
<td>Rural</td>
<td>42.1</td>
<td>77.7</td>
<td>30.8</td>
<td>69.5</td>
</tr>
<tr>
<td>Urban</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>India: Maharashtra state, 1972–73</td>
<td>24.6</td>
<td>54.6</td>
<td>16.6</td>
<td>52.9</td>
</tr>
<tr>
<td>Rural</td>
<td>40.4</td>
<td>86.3</td>
<td>42.1</td>
<td>87.0</td>
</tr>
<tr>
<td>Urban</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colombia, 1974</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Large cities</td>
<td>69.6</td>
<td>94.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All urban</td>
<td>62.0</td>
<td>89.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>51.2</td>
<td>60.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Enrollments are expressed as a percentage of the number in the age group. Poorest and richest refer (in the case of India, Nepal and Sri Lanka) to the bottom and top 10 percent of households ranked by expenditure per person, and (in the case of Colombia) to the top and bottom 20 percent of households ranked by income per person.
working, is more influenced by the level of the individual’s schooling than by any other factor. But there are also many studies of the direct effect of schooling on individual productivity and earnings, which are examined here under two heads—those relating to the self-employed and those relating to employees.

**THE SELF-EMPLOYED.** The hypotheses are straightforward: that primary education helps people to obtain and evaluate information about improved techniques and new opportunities, to keep records and estimate the returns of past activities and the risks of future ones. More generally, primary schooling is a training in how to learn, an experience in self-discipline and in working for longer-term goals.

Most of the empirical evidence comes from agriculture—studies comparing the productivity, yields and innovative activity of schooled and unschooled farmers. Not all these studies controlled adequately for other influences, particularly wealth; but many did (for example, by including farm size as a proxy for wealth).

The general weight of the evidence (see Table 5.3) lends strong and consistent support to the hypotheses—and is particularly compelling because the studies measure productivity directly, not through wages. Where the complementary inputs required for improved farming techniques were available, the annual output of a farmer who had completed four years of primary schooling was on average 13.2 percent more than one who had not been to school. As expected, where complementary inputs were not available, the increase in output resulting from additional schooling was on average smaller—but still substantial.

<table>
<thead>
<tr>
<th>Study</th>
<th>Estimated percentage increase in annual farm output due to four years of primary education rather than none</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>With complementary inputs</strong></td>
<td></td>
</tr>
<tr>
<td>Brazil (Garibaldi), 1970</td>
<td>18.4</td>
</tr>
<tr>
<td>Brazil (Resende), 1969</td>
<td>4.0</td>
</tr>
<tr>
<td>Brazil (Taquari), 1970</td>
<td>22.1</td>
</tr>
<tr>
<td>Brazil (Vicosa), 1969</td>
<td>9.3</td>
</tr>
<tr>
<td>Colombia (Chinchina), 1969</td>
<td>-0.8</td>
</tr>
<tr>
<td>Colombia (Espinal), 1969</td>
<td>24.4</td>
</tr>
<tr>
<td>Kenya, 1971–72</td>
<td>6.9</td>
</tr>
<tr>
<td>Malaysia, 1973</td>
<td>20.4</td>
</tr>
<tr>
<td>Nepal (wheat), 1968–69</td>
<td>20.4</td>
</tr>
<tr>
<td>South Korea, 1973</td>
<td>9.1</td>
</tr>
<tr>
<td><strong>Average (unweighted)</strong></td>
<td>13.2</td>
</tr>
<tr>
<td><strong>Without complementary inputs</strong></td>
<td></td>
</tr>
<tr>
<td>Brazil (Candelaria), 1970</td>
<td>10.8</td>
</tr>
<tr>
<td>Brazil (Conceicao de Castelo), 1969</td>
<td>-3.6</td>
</tr>
<tr>
<td>Brazil (Guarani), 1970</td>
<td>6.0</td>
</tr>
<tr>
<td>Brazil (Paracatu), 1969</td>
<td>-7.2</td>
</tr>
<tr>
<td>Colombia (Malaga), 1969</td>
<td>12.4</td>
</tr>
<tr>
<td>Colombia (Moniquira), 1969</td>
<td>12.5</td>
</tr>
<tr>
<td>Greece, 1963</td>
<td>25.9</td>
</tr>
<tr>
<td><strong>Average (unweighted)</strong></td>
<td>8.1</td>
</tr>
</tbody>
</table>

No information on availability of complementary inputs

| Average of eight studies (unweighted)       | 6.3                                                                                                         | No information on availability of complementary inputs |
| a. Improved seeds, irrigation, transport to markets and so on |                                                                                                             |

Investment priorities in education

Primary education is of particular importance in overcoming absolute poverty. But secondary, higher, vocational and adult education and training also have major roles to play.

**PRIMARY EDUCATION.** In countries where it is far from universal, the case for increasing the proportion of children who complete primary education is strong. While there have been high economic returns in the past, it has been suggested that the rate of return to primary schooling (especially in certain jobs) may decline as the proportion of the labor force with primary education increases. But
this may be offset by shifts in the pattern of production toward more skill-intensive goods. In Table 5.4 the rates of return to primary education in countries with adult literacy rates above 50 percent, while somewhat below those in countries with adult literacy below 50 percent, are still strikingly high. And in the few countries where studies have been done at different periods, rates of return have usually declined, but only mildly.

There are also favorable effects on equity. As primary education becomes more widespread, additional spending will be increasingly concentrated on backward rural areas, girls, and the poorest urban boys. In general, primary education tends to be redistributive toward the poor (see Table 5.5). In contrast, public expenditure on secondary and higher education tends to redistribute income from poor to rich, since children of poor parents have comparatively little opportunity to benefit from it.

Primary education, especially of girls, has favorable effects on the next generation’s health, fertility and education (see box overleaf). Finally, it enriches peoples’ lives. Many would regard this as sufficient justification for universal primary education, independent of its other benefits.

SECONDARY AND HIGHER EDUCATION.

Renewed emphasis on the importance of primary education, and its high returns relative to secondary and higher education, should not start the pendulum swinging too far in the other direction. High levels of knowledge are necessary for many people who serve the poor, both directly as teachers, health workers and agricultural extension workers, and indirectly as researchers, technicians, managers and administrators. While their skills must be developed to a considerable extent through practical experience and in other ways, there is for some purposes no better or cheaper substitute for the formal disciplines of conventional schooling. Even allowing for doubts about the estimated rates of return to secondary and higher education, and for the existence of some educated unemployment (see box on next page), there are unquestionably severe shortages of skilled people in many developing countries.

More economical ways of producing skilled people need to be found. First, greater use of in-career and on-the-job training should be

---

### Table 5.4 Rates of return to education (percent)

<table>
<thead>
<tr>
<th>Country group</th>
<th>Primary</th>
<th>Secondary</th>
<th>Higher</th>
<th>Number of countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>All developing countries</td>
<td>24.2</td>
<td>15.4</td>
<td>12.3</td>
<td>30</td>
</tr>
<tr>
<td>Low income/adult literacy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>rate under 50 percent*</td>
<td>27.3</td>
<td>17.2</td>
<td>12.1</td>
<td>11</td>
</tr>
<tr>
<td>Middle income/adult literacy rate over 50 percent</td>
<td>22.2</td>
<td>14.3</td>
<td>12.4</td>
<td>19</td>
</tr>
<tr>
<td>Industrialized countries</td>
<td>..</td>
<td>10.0</td>
<td>9.1</td>
<td>14</td>
</tr>
</tbody>
</table>

Note: In all cases, the figures are ‘social’ rates of return: the costs include forgone earnings (what the students could have earned had they not been in school) as well as both public and private outlays; the benefits are measured by income before tax. (The ‘private’ returns to individuals exclude public costs and taxes, and are usually larger.) The studies refer to various years between 1957 and 1978, mainly in the latter half of the period.

a. In this sample of 30 developing countries, those countries with low incomes also had literacy rates below 50 percent (at the time the studies were done). All the middle-income countries had literacy rates above 50 percent.

---

### Schooling, screening and productivity

The interpretation of rates of return to education—especially secondary and higher education—is still controversial. It has often been argued that educational qualifications are simply a “screening” device, signaling an individual’s productive qualities to an employer without actually enhancing them. In some developing countries, moreover, the public sector—and some heavily protected parts of the private sector—are the main employers of university and even secondary-school graduates; it has been suggested that the salaries they pay are often artificially inflated and bear little relation to relative productivity; and that educational requirements serve merely to ration access to these inflated salaries. In both cases, earnings differences associated with different levels of education would overstate the effect of education on productivity.

On the other side, it is argued that school “screening” is by no means all wasteful and is preferable to such other screening methods as caste or family connections. It is also argued that labor markets are not so monopolistic, and thus that relative wages are not such imperfect indicators of productivity, as those who have concentrated on their institutional characteristics and determinants have supposed. In developed countries the relative wages of different occupations have gradually but steadily changed in response to increases in the supply of educated labor. That the same process operates even in the public sector in developing countries is suggested, for example, by the fact that the relative salaries of teachers and civil servants are much higher in Africa, where educated manpower is much scarcer, than in Asia, where it is more abundant.

The conventional economic interpretation of the association between schooling and wages is further strengthened by a few studies showing that more educated workers have increased output in specific manufacturing industries, by evidence of substantial returns to education even in agriculture and other traditional small-scale activities, where one would expect educational credentials to be much less important, and by the macroeconomic evidence discussed in the box on page 38.
Middle East and North Africa, and parts of South Asia, the educational bias is even faster. The educational bias is most pronounced in South Asia, the region where female enrollments are today, they were growing even faster. The educational bias is most pronounced in South Asia, the Middle East and North Africa, and parts of Sub-Saharan Africa; but it exists to some extent in every region.

Why? From the parents’ point of view, education for their daughters may seem less attractive than for their sons. They may fear that education will harm their daughters’ marriage prospects, subsequent domestic life and even spiritual qualities. Girls’ education brings fewer economic benefits if there is discrimination against her in the labor market, if she marries early and stops working or if she ceases after marriage to have any economic obligations toward her parents. But parents and their daughters do respond rapidly to changing opportunities. When women took on key roles in the Anand Dairy Cooperative in Gujarat, India, education for girls became more valued. When a nutrition project in Guatemala offered employment to educated girls, the test scores of younger girls improved.

More generally, education does increase the chance of paid employment for girls. In Brazil married women with secondary education are three to four times more likely to be employed than those with primary education only—who in turn are twice as likely to work as women with no education at all. Education at about a fifth the cost of traditional schools, and allows would-be students who have to earn a living to continue their education at the same time. Recent studies (in Brazil, Kenya and the Dominican Republic) have also concluded that correspondence courses have effectively taught people in remote areas.

- In most countries the families of postprimary students pay too little for education. They are generally much better off than the national average: in Tunisia, for example, the proportion of children from higher income groups is nine times larger in universities than in elementary school. Since the rewards from higher education are large, it is highly desirable (though often politically difficult) to charge tuition and other fees to cover costs. Scholarships can be given to students whose families cannot afford to pay.

The cost of secondary and higher education makes it inevitable that in most countries demand for places will exceed supply for the foreseeable future, although some countries, such as South Korea, already have very high enrollment rates. But economic considerations are not the only relevant ones: secondary education often helps in lowering fertility and reducing child mortality (over and above the effects of primary education). All developed countries have found universal free secondary education to be desirable in its own right. The question for developing countries is less “whether” than “when.” Higher education clearly also has scientific, cultural and intellectual objectives, as well as economic ones.

### Vocational Education and Training

Experience shows that it is often inefficient to rely heavily on schools (as opposed to the workplace and short-term training programs).
Unemployment among the educated

Unemployment statistics in developing countries are sparse and often hard to interpret. Evidence on open unemployment (persons without a job and actively seeking employment) indicates that it is primarily an urban phenomenon heavily concentrated among workers in their teens and early twenties. Since these are the ages at which individuals typically leave school or university, there has been concern that educational expansion in developing countries will produce a growing problem of “educated unemployment.” But despite the increased outflow of students over the past decade, particularly secondary-school graduates, there is no evidence of rising trends in open unemployment rates. Unemployment statistics from a number of countries do, however, suggest that secondary-school leavers experience higher rates of unemployment than the uneducated or those with postsecondary education.

By and large, educated unemployment appears to be associated with the processes through which the labor market adjusts to an increased supply of school leavers. First, the earnings expectations or job preferences of school leavers may not keep pace with changes in labor market conditions brought about by increased numbers of workers with educational credentials. Second, the structure of wages may be slow to adjust—especially if the public sector is a major employer of educated workers. School leavers may then be encouraged to wait for jobs in well-paid occupations rather than immediately accept a job that pays significantly less; if the wage difference is high enough and the probability of obtaining a higher-paid job is sufficiently large, a period of job-seeking or unemployment will yield a higher expected “lifetime” income.

The educational pattern of unemployment is consistent with this explanation. It is not worthwhile for uneducated workers to remain unemployed as they search for a well-paid job. At the other extreme, highly trained people are scarce in many countries—so college graduates can get well-paid jobs immediately. But those in between—the secondary-school leavers—are neither assured of high-wage jobs nor completely out of the running; for them, there may be high returns to a full-time search for a job. Since the unemployed are young, with few dependents and often supported by their families, and since most of them eventually find jobs, neither the social nor the private costs associated with this unemployment are as serious as might appear.

Moreover, the fact that some primary- and secondary-school leavers are unemployed does not imply that the economy is unable to make productive use of more of them. Various studies have shown that the social rate of return to investment in education may be high despite the number of educated unemployed. But in the eyes of governments, frustrated school leavers or college graduates can form a politically volatile group. Some governments have therefore virtually guaranteed public-sector jobs for post-secondary leavers whether or not there has been socially productive work for them to do. This can result in a major drain on government revenues and impede the diffusion of educated manpower into more productive uses as well.

Institutions to develop vocational skills. Vocational and technical schools often find it difficult to strike the right balance between general preemployment training and the provision of specialized skills, and are often slow to adjust to the economy’s changing needs. In many school systems where competition for higher education is strong, they also suffer from low prestige.

By contrast, institutions that provide training in skills with wide applicability as a foundation for later on-the-job training or short-term courses (which may be needed more than once in a lifetime) are more likely to be successful, especially if, as in Brazil, Chile and Singapore, there is coordination with potential employers.

**Adult education.** Certain types of adult education play a useful role. To be effective, adult education must be conducted by dedicated and responsible teachers, and must address specific, felt needs; after a major review, UNESCO concluded that the poor results of most adult literacy programs were due to lack of demand. Where there is an explicit need, results have been better. For example, a recent review found that agricultural extension—which is essentially an applied form of adult education—generally helped to raise productivity; and the World Bank’s experience with the “training and visit” (T & V) approach to agricultural extension, which puts great weight on careful training and supervision of field workers, is consistent with this. In West Bengal, for example, T & V was introduced in 1975 and helped to raise the proportion of land area planted with high-yielding wheat and paddy varieties from less than 2 percent to 40 percent, in a single year. While T & V is effective even with illiterates, literate farmers tend to be more responsive to suggested changes.

**Implementing investment priorities.**

The education received by poor children depends on three things. The first is accessibility—are there school places for them within a reasonable distance from home? The second is use—do their parents send them to school, and are they allowed or encouraged to drop out? The third concerns the quality of the education that schools provide.

**Accessibility.** Financing constraints will often be compounded by difficulties in reaching the poor—distance, low-density populations and poor communications—so that building schools and supplying books, equipment and qualified teachers is a difficult and expensive task. For example, the Nepalese government estimates that it costs more than twice as much to build and equip a school in mountainous regions as it does
in the plains; and attracting qualified teachers to remote areas has proved to be extremely difficult.

There is often much that can be accomplished by administrative action with relatively little capital investment. Repetition of classes and early dropout may be the result of excessively high promotion standards. In these circumstances, the flow of students can be accelerated by more automatic promotion—while maintaining quality by correcting some of the causes of repetition or dropout. In many situations, resources can be freed for extending education by raising student-teacher ratios, which are the main determinant of unit costs (given teacher salaries) and are largely determined by class size. Extensive research shows that class size has surprisingly little effect on learning (see box). It is important to maximize the use of available facilities—by rotating classes, with staggered scheduling and double shifts in areas of high population density. If there are not enough pupils within an acceptable distance from school to fill individual classes, student-teacher ratios and the use of space can be significantly improved by taking new students only in alternate years (as has been done successfully in a project financed by the World Bank in Malaysia) and by teaching more than one grade in a class, as in another World Bank-financed project in El Salvador.

USE. Since most poor parents believe that education would benefit their children—in terms of status and the ability to stand up to officials and merchants, as well as in a more narrowly economic sense—they must have strong reasons for not sending their children to school if they have the chance. They may question whether they will benefit themselves; they may even regard the school as a threat to their traditional way of life; or they may simply believe that social or ethnic barriers are too great, or the quality of the available schooling, big is not necessarily bad

Class sizes vary widely in the developing world—at elementary schools, from more than 60 in four countries (Chad, Malawi, Congo-Brazzaville and Central African Republic) to less than 25 in seven (Iraq, Barbados, Bolivia, Uruguay, Romania, Mauritania and Mauritius). Yet once classes have more than 40 students, varying their size has almost no effect on student learning (though larger classes may weaken discipline and teacher morale). Between 15 and 40, students learn more in smaller classes (and still more in even smaller classes), but the benefits are slight. For example, reducing an elementary-school class from 40 pupils to 15 can be expected to improve average achievement (in a standard test) by only about 5 percentage points. By the same token, a modest increase—from 35 to 40 pupils, say—might reduce achievement by only a single percentage point. While there are obvious practical limits to increasing classes much above 50, the research does suggest that, for classes initially below 50, little will be lost if they are increased.

In sparsely populated areas, larger classes—if that means fewer schools—may increase the time it takes children to get to school. That could be a genuine discouragement, though in most places population density is high enough not to make it so.

less education than boys (see box on page 50). Since the mere existence of a school does not automatically mean it is used by all those eligible to attend, special measures may be needed to ensure that the education offered is attractive to the families for whom it is intended (see pages 78–79).

QUALITY OF EDUCATION. This is generally low in developing countries, and has been found (for example, in studies undertaken in Thailand, Malaysia and the Philippines) to be lower still for poor and rural pupils. Poor quality public schools may lead the well-to-do to choose private schools for their children, reinforcing social and economic inequality.

Casual observation and small-scale studies have long suggested that poor training of teachers, lack of textbooks, and inadequate school facilities lead to poor educational results and provide a weak basis for subsequent training. But broad-based evidence to demonstrate the extent of the resulting learning losses has only recently become available—from a large research project, the International Evaluation of Educational Achievement. But only four developing countries (Chile, India, Iran and Thailand) were among the 19 countries covered.

While international comparisons of student achievement must be approached gingerly, particularly when different languages or testing styles can affect the results, a clear pattern nonetheless emerges from the study. Differences in average performance of students from the 15 developed countries varied somewhat from subject to subject and country to country; but the differences by and large were small. The developing countries, however, did far less well—in all subjects tested, and at each of the three age levels examined.
A typical finding showed the mean score for students in a developing country to be in the bottom 5 to 10 percent of students from a developed country. Some of the handicaps of children in developing countries may be due to lower levels of parental education (which has a substantial impact, particularly in the preschool years) or in some cases to prolonged malnutrition. But the evidence suggests that they are mainly a reflection of low-quality schooling.

There are a number of promising approaches to improving educational quality in developing countries.

- The curriculum should take into account the linguistic and home backgrounds of students. Frequently curricula are too demanding, which only exacerbates tendencies to repeat classes or drop out, particularly for those from poor homes. Whenever possible, subjects should be illustrated with examples that draw on the child’s experience.

- The selection and training of teachers should be improved through more training facilities, greater use of in-service training, and more resources—teachers’ guides, advisory services, mass-media programs and bulletins. This takes time, however; for many countries, better teaching will be as much a consequence as a source of improved quality in schools.

- The design, production and distribution of learning materials should be upgraded. This applies particularly to textbooks, because research indicates that increasing their availability is the most consistently effective way of raising educational standards. A nationwide textbook project supported by the World Bank in the Philippines significantly increased student learning while increasing costs per student by only 1 percent. When school budgets are squeezed, it is all too easy to cut or defer spending on learning materials. But this is a costly alternative if costs are considered in terms of the education provided rather than simply per student in school.

- Properly designed and supported radio projects have potential for improving learning (and in certain cases reducing costs). To take a well-documented example, in Nicaragua regular radio broadcasts achieved dramatic improvements in mathematics for primary students. Although new technologies and growing experience are increasing the educational potential of television, lack of rural electricity and the high costs of capital, maintenance and operation put it out of reach for most countries.

Research into these approaches has indicated important potential, but it remains to be seen how much they can improve quality within the constraints of politically feasible budgets. This underlines the importance of finding cheap ways to improve quality if the educational gaps between developing and developed countries, and between rich and poor in developing countries, are to be narrowed.

Health

In general terms, the determinants of health have long been well known. One is people’s purchasing power (which depends on their incomes and on prices) over certain goods and services, including food, housing, fuel, soap, water and medical services. Another is the health environment—climate, standards of public sanitation and the prevalence of communicable diseases. A third is people’s understanding of nutrition, health and hygiene.

Knowledge is still evolving, however, on the relative importance of these different factors, and on the best ways to deploy government resources to improve health. By the end of the 1960s it was increasingly plain that health care systems modeled on those in the developed world were not the quickest, cheapest or most effective way to improve the health of the majority of people in developing countries. The 1970s have thus witnessed the evolution of a much broader approach to health policy, including an emphasis on universal low-cost basic health care. But despite some successful experiments, “primary health care” is still more of a slogan than a nationwide reality in most developing countries. To change this is the greatest health challenge of the 1980s.

Life expectancy and mortality

There is considerable variation among developing countries. In 11 of the richer ones, life expectancy is 70 years or more—close to the average level (74 years) in industrialized countries. But in low-income countries, life expectancy averages only 50 years, and several countries are under 45. Thus despite the health improvements that have occurred throughout the developing world over the past three decades, the gap between developed and developing countries remains wide.

Babies born in a developing country will on average live 20 years less than those born in the industrialized world. About half of this difference can be explained by what happens in the first five years of life. Some 17 percent of children in developing countries (and more than 30 percent in several of the poorest) die before their fifth birthday; in industrialized countries, only about 2 percent do. Mortality rates among children aged one to four in low-income countries are frequently 20–30 times those in industrialized countries, and sometimes even more. Although the gap tends to narrow
as average incomes rise, in a number of countries with 1978 incomes of more than $900 (including Jordan, Turkey, Algeria and Guatemala) the chances of a child dying between its first and fifth birthdays were still at least 10 times as great as in industrialized countries. On average, for children in developing countries who reach the age of five, further life expectancy is still eight to nine years less than in developed countries—and they are much more likely to suffer from disease (see next page).

The very high death rates among young children, combined with high birth rates, mean that a tragically large proportion of the deaths in a developing country occur among children under five (see Figure 5.2). For example, in Brazil in 1975 they were 48 percent of all deaths. In Sweden they were 1 percent. The main causes of child deaths in developing countries are diarrheal diseases and respiratory infections, especially influenza and pneumonia. (It has been estimated that diarrheal diseases cause 5-10 million deaths a year and respiratory diseases 4-5 million, making them by far the biggest killers for the population as a whole.)

Other diseases that make adults ill may be fatal in young children. Malaria, for example, has been estimated to kill 1 million African children a year. Common childhood diseases, such as measles, diphtheria, whooping cough and polio, which have either been virtually eliminated from developed countries or else reduced to minor nuisances, can be fatal or crippling in developing ones. A case of measles is often more than 200 times more likely to kill a child in a developing country than in an industrialized one. All of these diseases can be prevented by vaccination, yet fewer than 10 percent of the children born each year in the developing countries are being protected.

A major reason that these infections so often lead to death in preschool children in developing countries is their interaction with malnutrition, especially among children between six months and three years old. As a result, malnutrition appears to contribute to between one-third and two-thirds of all child deaths, and perhaps even more in the poorest countries. A comprehensive study of 35,000 deaths in 14 communities in Latin America found that 34 percent of deaths of children under five had serious malnutrition as an underlying or associated cause. An additional 23 percent of deaths were associated with premature births, which themselves partially reflected maternal malnutrition.

Compared with children, adult mortality patterns in developing countries show a much greater similarity to those in developed countries. There is also less difference between urban areas in developed and developing countries than between rural areas, since people who live in urban areas have higher incomes, are better educated and have better access to health care. About 60-70 percent of physicians in Africa work in urban areas, where about 20 percent of the population lives. Latin America is relatively well endowed with physicians, but two-thirds of them serve the large cities where only one-third of the population lives. This gap is much wider than can be justified on the grounds that specialized referral services must be located in towns.

Some of the health problems of developed countries, however, are magnified in developing ones. The need to achieve competitive costs has led industries in some developing countries to adopt lower standards of job safety than prevail in advanced countries, and accident rates are high. Similarly, the number of deaths per automobile is much greater than in advanced countries; for example, it is more than 100 times higher in Nigeria than in the United States and 16 times higher per vehicle-mile. The joint use of roads by pedestrians, animals, bicycles and motor vehicles is a major reason for this.

Even though many of the diseases and much of the death in developing countries reflects an unhealthy environment, there are significant differences between rich and poor (see Table 5.6). The poor, whether urban or rural, are more likely than the rich to live where diseases are endemic, and less likely to take preventive measures or to seek prompt medical care even when it is available. A poor family is much less able to tide itself over while a breadwinner is ill; even a relatively minor illness may plunge it from poverty into destitution.
Illness

Nonfatal diseases are more common and more serious in developing than developed countries. But the relatively small proportion of people over the age of 65 in most developing countries considerably reduces the significance of chronic, degenerative diseases—which affect about a third of the elderly in the United States, for example.

The most widespread diseases in developing countries are those transmitted by human feces—the intestinal parasitic and infectious diseases, but also poliomyelitis, typhoid and cholera. These spread easily in areas without safe community water supplies and good hygiene practices. While they are leading causes of death in young children, they are frequently chronic and debilitating rather than causes of acute illness or death. Their incidence is high. For example, the WHO estimated that in 1971 about 650 million people had ascariasis (roundworms). A World Bank study of construction workers at three sites in West Java, Indonesia, found 85 percent infected with hookworm.

Of the other diseases that usually cause debilitation in adults rather than death, tuberculosis in particular remains extremely widespread. Most debilitating diseases transmitted by insects or other carriers tend to be geographically more concentrated—although in 1976 it was estimated that 850 million people lived in areas where malaria persisted despite efforts to control it, and another 345 million in areas with little or no control. Schistosomiasis (bilharzia) is carried by snails, which flourish in slow-moving water. It is severe in East Asia, East Africa and in irrigated areas of Latin America; an estimated 180–250 million people are infected.

Trypanosomiasis (sleeping sickness) is found in a wide band in the middle of Africa. It is generally fatal if untreated in the early stages. Carried by the tsetse fly, it was largely under control in the 1950s, but has revived because control measures have slackened. It constitutes a serious risk to the life and health of at least 35 million people and has imposed great losses on animal herds. Chagas' disease, the Latin American form of trypanosomiasis, remains endemic in many rural areas.

Onchocerciasis (river blindness), carried by the simulium fly that breeds in swift-running water, is hyperendemic in parts of West Africa and Central America. In some areas it has led to the depopulation of fertile river valleys.

Attempts have been made to control these diseases by eliminating disease carriers through chemical and environmental mechanisms, but with only limited and in some instances temporary success. In some cases effective drugs exist. Control requires a well-developed health service to monitor outbreaks of the disease and take remedial measures.

For children, illness obviously disrupts their attendance at school and reduces their ability to concentrate and learn. As for adults, research on the consequences of their diseases has been very limited and has not produced consistent or generally applicable conclusions.

Some studies have shown that malaria control sharply reduced absenteeism—from about 35 percent to about 3 percent in one program in the Philippines in 1947. Anthropological research suggests that settlement on fertile lands has often been prevented by major diseases. There have been surprisingly few detailed studies of the effects of illness on productivity of individual workers; more research is needed in this area.

It is also likely that disease discourages innovation, by making people more reluctant to take risks or to commit themselves to activities where precise timing is crucial. A study of Paraguayan farmers suffering in varying degrees from malaria found that severely affected families obtained lower yields, cleared less land and avoided cultivating crops that required labor at specific times. In industry, capital may be substituted for labor where workers are frequently absent because of endemic disease.

**Differences in life expectancy within countries**

<table>
<thead>
<tr>
<th>Country and region</th>
<th>Income (national average = 100)</th>
<th>Life expectancy (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil, 1960–70</td>
<td>54</td>
<td>47.9</td>
</tr>
<tr>
<td>Northeast region</td>
<td>122</td>
<td>62.8</td>
</tr>
<tr>
<td>Tanzania, 1973</td>
<td>46</td>
<td>43.0</td>
</tr>
<tr>
<td>Kilimanjaro region</td>
<td>215</td>
<td>55.0</td>
</tr>
<tr>
<td>Thailand, 1969–70</td>
<td>78</td>
<td>55.6</td>
</tr>
<tr>
<td>North region</td>
<td>248</td>
<td>63.7</td>
</tr>
</tbody>
</table>

Table 5.6 Differences in life expectancy within countries

In its early stages, slowly declining mortality in Europe largely reflected improved nutrition, housing and hygiene brought about by rising incomes. The spread of education also helped. The initial stages of declining mortality in developing countries have been based on an additional factor—new technologies that affect masses of people, such as pesticides and vaccinations. It is estimated that life expectancy in developing countries in 1970 would have been eight years less than what it was without the contribution of these changes in public health technologies.

But some diseases, including most causes of diarrhea and many respiratory infections, cannot be prevented by currently available immunization or pesticides. Their reduction comes through improvements in sanitary conditions and...
nutrition, and changes in individual health habits. These diseases have declined least in developing countries and contribute most to mortality in those countries today.

There has been considerable concern that developing countries, particularly in the high mortality areas of Sub-Saharan Africa and South Asia, have not maintained the momentum of the 1950s in reducing disease. This is largely because countries have moved beyond the "technological" phase of improving health: the closer they come to developed-country levels, the harder it is to progress at the same rate. It also reflects the fact that some communicable diseases have increased. The number of cases of malaria, for example, rose nearly threefold between 1972 and 1976; other diseases have also spread, though not so sharply.

These reversals have happened partly because authorities became overconfident and allowed control programs to run down. In addition, control became much more expensive in the early 1970s. Pesticide prices escalated and disease carriers developed a tolerance for common, inexpensive pesticides (especially DDT). Economic development has sometimes made matters worse: small-scale irrigated agriculture has expanded agricultural production—but also the habitat of snails that carry schistosomiasis.

Programs to control endemic diseases—especially malaria and sleeping sickness—now exist in most of the affected areas. They can be operated effectively without people changing their behavior (though this is less true of schistosomiasis, since people as well as snails play a role in its transmission). Pesticides can often be used more efficiently.

There is also room for better coverage by immunization programs, even in areas not otherwise provided with government health services. Sierra Leone, for example, employs recruitment teams; they enlist the help of local leaders in gathering together everyone who needs to be immunized immediately before the vaccinators arrive in the village.

Apart from these efforts, major progress in family health behavior and in the provision of health services is needed. Simple treatment can frequently be effective: for example, the lives of children with acute diarrhea can often be saved by feeding them a solution of water, salt and sugar (see box).

Oral rehydration

A simple innovation has revolutionized the treatment of a major killer in developing countries. Diarrhea normally stops on its own accord after three to five days, but it occasionally causes a severe loss of body fluid; the resulting dehydration is often fatal, particularly to young children. Replacing that fluid can prevent most deaths.

For more than a century, fluid has been intravenously "dipped" into sufferers—a method with obvious drawbacks in countries where there are few medical facilities. In the past 12 years it has gradually been established that an oral dose has just the same effect. Even during diarrhea, the intestine continues to absorb glucose—and glucose will carry water and essential salts with it.

Oral rehydration had its most impressive initial success in 1971, in camps for refugees from the Bangladesh war. More than 3,700 patients were treated in two months under extraordinarily difficult circumstances, with a case fatality rate of 3.6 percent instead of the 30 percent before the treatment began. Oral rehydration has since been used to prevent or treat dehydration due both to cholera and to other diarrheas in many countries of Asia, Africa and Latin America. Properly delivered, it could save millions of lives a year.

The WHO currently recommends an oral rehydration mixture consisting of:

- table salt (sodium chloride), 3.5 grams;
- bicarbonate of soda, 2.5 grams;
- potassium chloride, 1.5 grams;
- and glucose, 20 grams.

These ingredients are usually mixed and packaged beforehand; the health worker (or a child’s mother) simply dissolves the mixture in one liter of water. Pre-packaged mixes range in cost from $0.07 to $0.10, and one to three packets might be needed while the diarrhea lasts.

There now is considerable interest in the possibility that mothers could mix a dose from the two ingredients that are available in most homes—sugar and table salt. But the recipe lacks potassium and bicarbonate (both of which are lost during diarrhea), and using too much salt could be dangerous for the child.

Home-mixing and the standard WHO formula are not, of course, mutually exclusive. One report (based on a field experiment in Narangwal, India) recommended home-mixing for relatively mild cases of diarrhea, with a variant of the WHO formula used only for more severe ones. This experiment placed principal responsibility for treatment in the hands of auxiliary nurse-midwives (who live in the villages) and the mothers of affected children. While the incidence of diarrhea changed little after the new treatment was introduced, the case fatality rate declined by almost half—from 2.7 per 1,000 to 1.5 per 1,000.
are more expensive and less critical to health. (Latrines, septic tanks and other lower-cost alternatives to conventional sewerage are less likely to contaminate water supplies if the water is centrally treated and distributed under pressure in pipes.) But water supply systems must be maintained—something that is frequently neglected. A World Bank review of village water supplies found two countries in which systems were failing faster than they were being constructed.

Although heavy investment in water supplies is often warranted as a means of raising living standards, it is unlikely to produce quick or dramatic improvements in health—and is expensive for low-income countries. Even public standpipes and yard taps, while much cheaper than conventional house connections with internal plumbing, can cost more than $40 per person (in 1978 prices). In contrast, immunization against all common childhood diseases costs at most $5 per child.

**Availability of health care**

The amount spent on health care varies widely throughout the developing world, though it is typically very low. Government health budgets in low-income Africa and Asia are usually less than $5 per person a year (and frequently much less). Private outlays are often larger—in Bangladesh, for example, individuals spent an estimated $1.50 each in 1976, or three times what the government was spending. But the combined total of $2 compares with about $700 in the Federal Republic of Germany. This gap would remain huge even if allowance were made for differences in prices. It is thus not surprising that in the mid-1970s in Bangladesh there were 9,260 people per physician, 5,600 per hospital bed, and 260 per nurse or midwife, compared with 490 per physician, 80 per hospital bed, and 260 per nurse in the Federal Republic of Germany. (Some of the middle-income countries, though, have almost as many physicians per person as the developed countries do.)

For many necessary but simple medical tasks, paramedical workers are likely to do a better job than physicians, who may be dissatisfied with their work in rural areas and so turn to private practice. In many countries, however, there are even fewer nurses than there are doctors.

In many developing countries, people typically live in scattered, often small villages and cannot travel far. They are therefore unwilling or unable to seek out modern health facilities in urban areas, except in extraordinary emergencies. Moreover, where rural health facilities are available, they are usually far too small to employ a physician full time—and certainly too small to make efficient use of equipment and auxiliary staff. Although occasional visits by traveling doctors and nurses can help, they are obviously unable to provide services at short notice. They may also not develop sufficient individual rapport with patients.

**Primary health care**

The widespread provision of basic preventive and curative medical services is essential. But in an attempt to tackle both the broader causes of health problems and administrative, political and other implementation problems (see Chapter 6), the WHO and UNICEF have recently sponsored a concept called "primary health care" that goes far beyond these services. It is an integrated approach to health that also spans food production, education, water and sanitation; in addition, it emphasizes self-reliance and partnership between communities and government.

The concept has achieved widespread intergovernmental support, especially from the 1978 International Conference on Primary Health Care. This has been no mean political achievement; but in most countries the rhetoric still must be translated into more money and reorganized health systems.

A key element of primary health care, or of any health care system that attempts wide coverage at relatively low cost, is the use of community health workers (CHWs) with limited training both to provide front-line services and to refer seriously ill patients or special cases to larger dispensaries and hospitals (see box overleaf). The potential duties among which their time must be allocated are maternal and child health care, midwifery, family planning, treatment of injuries and helping to move seriously injured people to referral facilities. In addition, they may organize immunization and mass treatment programs, provide guidance on nutrition, family planning and hygiene, and monitor epidemics, water quality and sanitation.

Although several examples (including China—see box on page 74) have shown that effective primary health care is feasible even for low-income countries, it makes fairly heavy administrative demands. An effective coordinated approach is needed—involving careful selection and training of CHWs, thorough supervision, referral of serious cases to better trained and equipped people, and adequate (but controlled) availability of drugs and other supplies. Without this, CHWs are likely to become demoralized, discredited and inefficient—and their recommendations for curative and preventive care disregarded.

Moreover, the emphasis that this Report (and others) gives to
Lessons of experience

National experience with primary health care systems is still very limited. The Chinese barefoot doctors date from the mid-1960s (see box on page 74). During the 1970s countries as diverse as Iran, Brazil, Sudan, India, Jamaica, Botswana and Tanzania began large-scale systems. Their experience has shown which are the key requirements of success.

- Political support and finance. It is vital to secure the support of substantial share of the country’s “health establishment”; without this, sound medical supervision and adequate finance will not be possible, and primary health care will be little more than an empty gesture toward the poor. It is also important to ensure that this type of medicine is not mislabeled as “second rate.”

The Community Health Worker (CHW) should work cooperatively with the community, if possible through such recognized organizations as the local council or village development committee (as they do in Botswana and Sudan). This builds community support and increases chances of improving family health practices; hours of service, use of drugs and materials, and patient satisfaction can also be monitored. The community organization should have access to the supervisor of the CHW.

At least part of the CHW’s salary should be paid by government so that health officials can retain some control. But some local finance or voluntary efforts also make the CHW responsive to local concerns—and in turn can make the community more aware of the services offered. The government of India is providing a stipend of 600 rupees a year ($76) to “volunteer” health workers. Whether local pressures work in the interests of the poor depends on the degree to which the local political system reflects these interests. China has succeeded in making the community entirely responsible for compensating the CHW. But overreliance on local finance may mean that the poorest communities get the worst attention.

- Recruitment and training. The CHW should be mature enough to enjoy the respect of the community. Early programs stressed formal education as a qualification for the CHW, and thus recruited young people. Reviews of experience in Sudan clearly indicate that such people are not easily accepted by communities. Ideally the CHW should have children and personal experience with health crises. Programs now recruit highly motivated, older people even if younger applicants are better educated. The CHW also should live in the community; this has been found to reduce turnover as well as ensure familiarity with local culture. In some countries, such as Iran and Yemen, it has been necessary to train both a male and a female CHW because of objections to treatment by members of the opposite sex.

Community health workers must be given enough training, equipment and supplies to ensure that only one patient in four or five is referred to higher levels. High referral rates undermine the community’s confidence in the CHW and also increase the probability of patients bypassing him or her. This conclusion has been confirmed by studies in Mexico and Thailand. Moreover, several countries feel that CHWs should have the chance to develop their careers, by competing for entry into higher grades. Sudan, for example, is planning to confine its “medical assistant” training programs to CHWs.

- Supervision and supplies. Frequent supervision of the CHW is essential. The isolated, modestly trained CHW is rarely confident of his or her skills and often encounters difficulties that instructors did not anticipate. Experience in Tanzania underlines the need for sound, continuous supervision. Supervisors should provide in-service training and ensure that performance meets minimum standards. Iran, Sudan and Botswana have found that it is better to overestimate the amount of supervision needed than to risk undermining the confidence and credibility of the CHW. Workers should be visited regularly by staff from neighboring dispensaries, health centers and hospitals as well as from the office of the regional medical officer. This compensates for frequent transport difficulties or competing demands on the supervisor’s time. In addition, it ensures that a broad range of issues (from clinical care to drug management) are considered, and that visits from the outside are regarded as routine, not part of a crisis.

Providing facilities for telephone or radio contact between CHWs and supervisors has provided backup and helped avoid unnecessary referrals in Honduras, for example. Physicians or highly trained health personnel often give curative work priority over supervision of CHWs—so nontechnical personnel should also play a part in the supervision and monitoring of CHWs.

A standard, simple set of drugs should be provided to CHWs; if budget cuts are necessary, they should not fall on medicines and supplies for the CHW (as has sometimes been the case). Standards are required for the use of drugs and supplies; and the drugs provided to individual CHWs should be monitored to identify misuse or misappropriation. Kenya has developed a model program for managing drug use, based upon carefully devised treatment standards.
per hospital and clinic, and to staff and equip them better. But even in industrialized countries, there is a strong trend toward more emphasis on paramedical workers to improve the spread and effectiveness of basic health care and to help keep costs down.

In many countries it is also desirable to make use of, and provide some training for, traditional health practitioners, such as "ayurveds" in South Asia and the traditional birth attendants found in almost every country. This is partly because they often have the trust of their patients and because patients pay for their services (enabling government funds to be spread farther); but it is primarily because in many countries, including some of those where the world's poor are concentrated, these practitioners provide near-universal coverage of people who, realistically, will not be reached by effective government health programs for some time to come. Training can help them to improve their treatment, dispense some modern medicines and participate in health or family planning education.

In addition, there is still an urgent need for research to develop measures to prevent or treat common disabling diseases—for example, malaria, schistosomiasis and the main causes of diarrhea in children—that are simple and cheap enough to be applied within the framework of a primary health care system.

Nutrition

Systematic efforts at national nutrition planning in developing countries go back barely a decade. During that brief time there has been considerable progress in establishing the extent and causes of malnutrition and what can be done to reduce it.

Ten years ago, malnutrition was often thought to reflect primarily a shortage of protein (and in some cases, vitamins or minerals). Most nutrition programs concentrated on providing high-protein food to children, usually in schools. The emphasis today is different. There is now a wide measure of agreement on several broad propositions.

- Serious and extensive nutritional deficiencies occur in virtually all developing countries, though they are worst in low-income countries. They are usually caused by undernourishment—a shortage of food—not by an imbalance between calories and protein. There may often be shortages of specific micronutrients and of protein, especially among young children. But given the typical composition of the diets of the poor, to the extent that calorie requirements (as estimated by the FAO and the WHO) are met, it is likely that other nutritional needs will also be satisfied.

- Malnutrition affects old and young, male and female, urban and rural dwellers; particularly prevalent among children under five, it reduces their resistance to diseases and is a major cause of their death. In many societies, girls suffer more than boys.

- Malnutrition is largely a reflection of poverty: people do not have enough income for food. Given the slow income growth that is likely for the poorest people in the foreseeable future, large numbers will remain malnourished for decades to come.

- Poor nutritional practices and the inequitable distribution of food within families also are causes of malnutrition.

- The most effective long-term policies are those that raise the incomes of the poor, and those that raise food production per person. Other relevant policies include food subsidies, nutrition education, adding minerals or vitamins to salt and other processed foods, and increasing emphasis on producing foods typically consumed by the poor.

These points will be amplified in the following discussion.

Prevalence of malnutrition

Evidence of serious malnutrition in almost all developing countries comes from three main sources: estimates of food consumption, anthropometric and clinical studies, and data on child mortality.

The estimates of food consumption by different income groups normally show that in all but the richest developing countries, consumption by large sections of the population is well below what is needed for a minimally satisfactory diet. Undernutrition is most widespread in Africa (where in many countries food supplies have not even kept up with population growth) and in South Asia. It is also common in Latin America and the Middle East. Estimates of the total number of malnourished people are surrounded by controversy: there is dispute about what calorie and protein requirements are on average "adequate"; individuals may have requirements very different from the average; and within households food often is not distributed in proportion to individual needs. Nevertheless, allowing a wide margin for uncertainties, the evidence is strong enough to conclude that several hundred million people are undernourished.

Anthropometric and clinical studies (based on measures of height, weight for height, arm circumference, skin-fold thickness, blood tests and so on) show, for example, that children from wealthier families, or from families that have migrated to developed countries, tend to grow substantially taller than do children of the poor.

The data on child mortality
reflect the combined effects of sickness and malnutrition. Infections can reduce appetite and food intake in several different ways, including the action of intestinal parasites; and they can reduce the proportion of nutrients that the body absorbs. Undernutrition in turn weakens the body's immunizing mechanisms—and so lowers its defenses against the initial infection, while making it more susceptible to further infections. As previously noted, malnutrition is estimated to be a contributory cause of a third or more of infant and child deaths in developing countries (see page 54).

Kinds of malnutrition

Most malnutrition reflects a shortage of calories, protein, or both. But some diets are inadequate because they lack specific nutrients. Anemia, resulting primarily from blood loss and too little iron, is the most prevalent example of this. A recent estimate is that at least 500 million people are anemic. The consequent fatigue, the apparent lethargy and apathy, and the adverse effects on productivity and school performance can be so common in poorer societies as to appear normal. It is estimated that more than half the victims of anemia are adult women in developing countries. Anemia due to iron and folic acid deficiency is common among pregnant women—and harmful, because it can lead to premature birth and a much lower chance of survival for the newborn child. The more children a woman has, the greater the probability of severe anemia—so adding to the cycle of poverty, high fertility and low rates of child survival.

Goiter is another common disorder (affecting perhaps 200 million people) caused by a micronutrient deficiency—in this case, iodine. Available evidence suggests that iodine deficiency can stunt physical and mental development, and reduce energy and motivation. In communities that have an exceptionally high incidence of goiter, 4 percent or more of children may be deaf-mutes or cretins.

Vitamin A deficiency is also extensive—affecting, it has been suggested, half the children in many developing countries. In an extreme form it can lead to blindness. But in less serious forms it can still lead to poor eyesight, undermining educational performance and adult earning power. It can also affect growth, skin condition and the severity of other nutritionally related illnesses.

Victims of malnutrition

Young children suffer most from undernourishment, followed by pregnant and nursing mothers. In many countries, there is considerable evidence that girls are less well nourished than boys. This is especially true of South Asia, where newborn girls have significantly smaller chances of surviving to age five; in a number of countries, including some in the Middle East, girls are weaned substantially earlier than boys (see box on page 91).

Most childhood malnutrition does not result in early death. But it means severe hardship beginning at birth, which may prevent children from ever escaping the poverty into which they were born. Malnutrition stunts growth; in severe cases it may retard mental development even after its physical effects have been shaken off. Several studies have shown that children who have recovered from severe clinical malnutrition during their preschool years continue to do significantly worse in intelligence and other tests than their unaffected classmates.

There is also some evidence, less conclusive, of the harmful effects of mild long-term malnutrition; some studies in developing countries have shown that better-nourished children (as measured by height for age) do better in mental tests. It is not always possible to isolate nutrition from other factors affecting intelligence, but there is some evidence of its independent effects.

Malnutrition also affects earnings. In part, this reflects the consequences of childhood malnutrition on mental development and educational achievement; but there are also links between nutrition and physical productivity. In the long run, adults can only be as energetic as their diets will allow—otherwise they would gradually become emaciated and ill. For example, farmers who are badly malnourished put in fewer hours per hectare than those who are better nourished. Research on the relation between nutrition and productivity has not been extensive, but a few studies have suggested that greater height or weight leads to greater physical productivity.

In contrast to most other indicators of well-being, malnutrition in many countries appears to be at least as serious in urban as in rural areas. Surveys in India, Brazil, Thailand and Indonesia have shown that the proportion of the population with very low calorie consumption is substantially greater in urban areas. This is partly because of the higher cost of food in many urban areas (although not in those with food subsidies) and higher expenditures for such things as house rents and public transport.

But to some extent it is a sign that living and working in cities is less physically demanding than in rural areas, rather than an indicator of greater malnutrition.

In any event, because the poor are primarily rural, malnutrition remains primarily a rural problem. Rural populations are also more likely to suffer seasonal variations in food consumption; they are most affected in the wet season, when twin
peaks in farm work and widespread infection often coincide with the period when food is in shortest supply.

**Causes of malnutrition**

To what degree is malnutrition, especially among young children and pregnant and nursing mothers, caused by (a) inadequate family incomes, (b) ignorance of good nutritional practices and (c) the inequitable distribution of food within families? There is some evidence that all three factors are important, but that low incomes are the central cause.

The famines in Ethiopia in 1973–74 and Bangladesh in 1974 were not caused by a fall in the average amount of food available per person. Rather, droughts caused local declines in farm incomes, so that people in affected areas could not afford to buy food from the unaffected areas.

At the global level, if income were distributed differently, present output of grain alone could supply every man, woman and child with more than 3,000 calories and 65 grams of protein per day—far more than the highest estimates of requirements. Eliminating malnutrition would require redirecting only about 2 percent of the world’s grain output to the mouths that need it.

Major crop failures, which simultaneously reduce rural incomes and national food supplies, can have even more catastrophic effects on nutrition. While improved transport and international movement of food will reduce the impact on prices, events such as the two monsoon failures in India in 1965 and 1966 can have a terrible impact on the poor: supplies of basic food grains fell 12 percent and prices rose sharply. Relative to the prices of manufactured goods, they were 37 percent higher in 1967 than in 1963–65. In addition, the crop failures cut the incomes not only of farmers, but also of agricultural laborers, petty traders and workers in food-processing industries.

Poor people spend the bulk of their income on food. In India in 1973–74 the poorest 20 percent were devoting 83 percent of their total spending to food—yet on average ate fewer than 1,500 calories a day each. At these very low levels, the consumption of calories (usually derived from the cheapest kind of food) changes almost proportionately with changes in income. As incomes rise, a little margin enters the budget (see box).

A lack of money is frequently compounded by poor nutritional practices. Several common beliefs about nutrition have harmful effects and must be attributed primarily to ignorance rather than poverty. For children, the weaning period is particularly critical. While it is desirable to continue breastfeeding for the first year of life, milk should be supplemented by solid food by six months of age; this is often delayed. It is also likely that the poor nutrition of pregnant and nursing mothers may at least partly reflect a lack of knowledge. Several studies have found that better-educated parents have better-nourished children: that this reflects more than the higher incomes of educated parents is suggested by the fact that the mother’s education is more important than the father’s.

Education—especially girls’ education—may also help remedy one of the most serious and intractable nutritional problems: the way food is distributed within the family. A variety of evidence indicates that in most developing countries adult

![Composition of expenditure, by income group, Indonesia, 1976](image)

One study in a Java village found that on average a woman works 11 hours a day. Roughly six hours are spent on income-earning activities (wage work, handicrafts, producing food for sale). The other five hours are spent around the home (collecting firewood, looking after children, sweeping and so on)—and preparing food, which takes three hours a day.

---

Food and the poor

As people get higher incomes, they eat better—and spend proportionately less on food. The chart shows household spending patterns in Indonesia, but its essence applies to every developing country. The richest households spend a higher proportion of their total budget on housing, fuel, light and water than the poorest do on all nonfood items.

The composition of diets varies, too (a fact whose implications for policy are explored on page 62). The poorest 30 percent of people in Indonesia obtain about 40 percent of their calories from cassava and corn and 46 percent from rice, while the richest 30 percent obtain only about 14 percent of their calories from cassava and corn and 59 percent from rice.

Not only is food the main element in poor people’s budgets, but preparing it takes up a lot of their time. Rice must be threshed, winnowed and hand-milled to remove the husk and bran; wheat and maize must be threshed, winnowed and ground to produce flour; cassava must be skinned, boiled, pounded, strained and dried to get rid of its deadly prussic acid; spices must be ground by hand; and so on—all before any actual cooking is done.

---

One study in a Java village found that on average a woman works 11 hours a day. Roughly six hours are spent on income-earning activities (wage work, handicrafts, producing food for sale). The other five hours are spent around the home (collecting firewood, looking after children, sweeping and so on)—and preparing food, which takes three hours a day.

---

![Composition of expenditure, by income group, Indonesia, 1976](image)

One study in a Java village found that on average a woman works 11 hours a day. Roughly six hours are spent on income-earning activities (wage work, handicrafts, producing food for sale). The other five hours are spent around the home (collecting firewood, looking after children, sweeping and so on)—and preparing food, which takes three hours a day.

---

![Composition of expenditure, by income group, Indonesia, 1976](image)

One study in a Java village found that on average a woman works 11 hours a day. Roughly six hours are spent on income-earning activities (wage work, handicrafts, producing food for sale). The other five hours are spent around the home (collecting firewood, looking after children, sweeping and so on)—and preparing food, which takes three hours a day.

---

![Composition of expenditure, by income group, Indonesia, 1976](image)

One study in a Java village found that on average a woman works 11 hours a day. Roughly six hours are spent on income-earning activities (wage work, handicrafts, producing food for sale). The other five hours are spent around the home (collecting firewood, looking after children, sweeping and so on)—and preparing food, which takes three hours a day.

---

![Composition of expenditure, by income group, Indonesia, 1976](image)

One study in a Java village found that on average a woman works 11 hours a day. Roughly six hours are spent on income-earning activities (wage work, handicrafts, producing food for sale). The other five hours are spent around the home (collecting firewood, looking after children, sweeping and so on)—and preparing food, which takes three hours a day.

---

![Composition of expenditure, by income group, Indonesia, 1976](image)

One study in a Java village found that on average a woman works 11 hours a day. Roughly six hours are spent on income-earning activities (wage work, handicrafts, producing food for sale). The other five hours are spent around the home (collecting firewood, looking after children, sweeping and so on)—and preparing food, which takes three hours a day.

---

![Composition of expenditure, by income group, Indonesia, 1976](image)

One study in a Java village found that on average a woman works 11 hours a day. Roughly six hours are spent on income-earning activities (wage work, handicrafts, producing food for sale). The other five hours are spent around the home (collecting firewood, looking after children, sweeping and so on)—and preparing food, which takes three hours a day.

---

![Composition of expenditure, by income group, Indonesia, 1976](image)

One study in a Java village found that on average a woman works 11 hours a day. Roughly six hours are spent on income-earning activities (wage work, handicrafts, producing food for sale). The other five hours are spent around the home (collecting firewood, looking after children, sweeping and so on)—and preparing food, which takes three hours a day.

---

![Composition of expenditure, by income group, Indonesia, 1976](image)

One study in a Java village found that on average a woman works 11 hours a day. Roughly six hours are spent on income-earning activities (wage work, handicrafts, producing food for sale). The other five hours are spent around the home (collecting firewood, looking after children, sweeping and so on)—and preparing food, which takes three hours a day.

---

![Composition of expenditure, by income group, Indonesia, 1976](image)

One study in a Java village found that on average a woman works 11 hours a day. Roughly six hours are spent on income-earning activities (wage work, handicrafts, producing food for sale). The other five hours are spent around the home (collecting firewood, looking after children, sweeping and so on)—and preparing food, which takes three hours a day.

---

![Composition of expenditure, by income group, Indonesia, 1976](image)

One study in a Java village found that on average a woman works 11 hours a day. Roughly six hours are spent on income-earning activities (wage work, handicrafts, producing food for sale). The other five hours are spent around the home (collecting firewood, looking after children, sweeping and so on)—and preparing food, which takes three hours a day.

---

![Composition of expenditure, by income group, Indonesia, 1976](image)

One study in a Java village found that on average a woman works 11 hours a day. Roughly six hours are spent on income-earning activities (wage work, handicrafts, producing food for sale). The other five hours are spent around the home (collecting firewood, looking after children, sweeping and so on)—and preparing food, which takes three hours a day.

---

![Composition of expenditure, by income group, Indonesia, 1976](image)

One study in a Java village found that on average a woman works 11 hours a day. Roughly six hours are spent on income-earning activities (wage work, handicrafts, producing food for sale). The other five hours are spent around the home (collecting firewood, looking after children, sweeping and so on)—and preparing food, which takes three hours a day.
women receive a lower proportion of their food requirements than adult men; girls are likewise generally less well-fed than boys. As between adults and children, the picture is less clear: in many countries children under five (and particularly up to age three, when they are less able to take food themselves) do much worse than adults; in some countries, though, this is not the case.

These sorts of discrimination sometimes reflect difficult choices made under severe economic duress, including a justifiable concern for the breadwinner. But they also reflect ignorance of nutritional priorities and deep-rooted cultural biases. (Concern for this problem appears to have been one of the reasons for the Chinese experiment with communal feeding during the Great Leap Forward in 1958–59. It encountered massive social resistance and was abandoned.)

Nutrition policies and programs

The causes and consequences of malnutrition suggest various cures. Boosting food production (especially of food that poor people eat and grow) and raising the incomes of the poor are the two central requirements in most countries. They can be reinforced by other efforts—food subsidies of various kinds, fortifying food, and educating people to know what a good diet is.

Agricultural production. Increased food consumption by the poor is in most countries unlikely to be sustained unless production is raised as well. For nutritional purposes, much can be achieved by producing more of what the poor traditionally eat—such as millet and other coarse grains and root crops. These are, in general, the cheapest source of calories. They have other advantages, too. Some of them require less irrigation and drainage than other crops; and, in the case of root crops, many can be grown throughout the year and are drought-resistant. In addition, both root crops and coarse grains tend to be produced by small farmers, who would benefit if encouraged to produce more.

Coarse grains can often be grown together with low-cost vegetable sources of protein. Although cassava is very low in protein, studies show that its price is so low that most of the people who meet most of their calorific needs by eating a lot of it are able to buy enough protein-rich food to balance their diets. But there has not been enough emphasis on the production of cheap sources of protein, such as the cheaper varieties of beans and lentils.

Despite long-standing neglect in research, extension services, access to credit and so on, in recent years there has been greater awareness of the importance of foods eaten by the poor. The international agricultural research centers (in particular those in India, Colombia, and Nigeria) have increasingly extended their research to these crops and have given more attention to nutritional issues.

Food marketing and storage programs can also have a major nutritional impact by reducing regional, seasonal and annual variations in food supplies and prices—which contribute significantly to malnutrition. Market stability can also be helped by better transport and roads.

Food subsidies. Few low-income countries have come near to nutritional adequacy without some form of food subsidies. Sri Lanka's ration-and-subsidy program in 1970 provided about 20 percent of the calories and 15 percent of the incomes of the poorest quintile of the population. Largely as a result, severe malnutrition was reduced to a remarkably low level for such a poor country. Because of this, and Sri Lanka's health and education services, life expectancy has reached 69 years. When subsidized food rations were sharply reduced in 1974, largely because of a steep increase in the price of imported food, Sri Lanka's death rate rose noticeably (even after allowances for other plausible influences); it declined again in 1976 and 1977, when food became more plentiful. Large-scale food subsidies are also common in the Middle East and North Africa; they have played a significant part in improving the nutrition of the poor.

But general food subsidies have a major drawback—they are very expensive. They have cost as much as 10–20 percent of government spending in some countries, including Egypt, South Korea (temporarily in 1974–75) and Sri Lanka. Much of the cost is for imports, which use up scarce foreign exchange or aid. And some of this goes to people who do not really need to be subsidized.

Countries with strong administration can organize income tests—not perfectly, but well enough to cut costs. Sri Lanka, for example, could have done more for the nutrition of the poor in 1974 if it had concentrated the available rations on them. In 1978 it introduced an income test to restrict subsidies to the poorer half of the population. But for many countries this would not be administratively or politically feasible.

Alternative ways of restricting subsidies to poor people include subsidizing cheap foods that other groups tend to neglect. Sorghum, a low-status food, was introduced into ration shops in Bangladesh in 1978—and in some rural areas was bought by nearly 70 percent of low-income households, but only 2 percent of high-income households. Subsidized foods may be...
consumption of about 100 calories. A day gave them a net increase in children directly with 300 calories outside the home, parents tend to familysince if children get food have been shared with the whole In both cases, however, benefits food supplements have been given ableyoung children and pregnant on the nutritionally most vulner- and have tried to target assistance Some countries have gone further down domestic food prices to cut the cost of subsidy programs; and farm prices may decline if too much food is imported for the subsidy program—more, that is, than the net increase in food consumption. But countries (and food-aid donors) can anticipate and avoid adverse effects on incentives. Well-designed subsidies should be able to reduce food prices for consumers and also (since this increases the effective demand for food) to maintain prices for farmers. And proceeds from food aid sold through subsidy programs can, for example, be used directly or indirectly to support agricultural programs. Introducing subsidies requires care, however, since the political cost of abandoning them is likely to be high.

SUPPLEMENTARY FEEDING PROGRAMS. Some countries have gone further and have tried to target assistance on the nutritionally most vulnerable—young children and pregnant and nursing mothers. In some cases food supplements have been given for home consumption; in others children have been fed directly. In both cases, however, benefits have been shared with the whole family—since if children get food outside the home, parents tend to give them less from the family pot. Studies of some preschool feeding programs in the mid-1970s showed that schemes providing children directly with 300 calories a day gave them a net increase in consumption of about 100 calories. And only a small minority were in the most vulnerable group of all—under two years old. Such schemes tend to be relatively expensive: in a number of these projects, annual food costs averaged $10–17 per child, with administrative costs adding a further $3–7.

FOOD FORTIFICATION. Adding specific micronutrients to food at the processing stage is common in both developed and developing countries. But there are two general difficulties. First, those who do not need the supplement still get it, so that the cost per person needing assistance may be high, even if the cost per person receiving the supplement is low. Second, the poor may buy little processed food, and even that may be from small, scattered processors—so that fortification is hard or uneconomic to arrange.

The best results have come from adding iodine to salt to prevent goiter; almost all high-income countries and some developing countries have succeeded with this. Annual costs are much less than one cent per person. Such programs are not yet universal (but may not be effective if people get much of their salt from non-commercial sources or very small producers).

Vitamin A has been added to a variety of foods (including tea, sugar, margarine, monosodium glutamate and cereal products) in several developing countries. It is both effective and cheap—for example, three cents a person a year could provide 80 percent of Guatemalans with 75 percent of their daily requirements. Much more could be done.

Since anemia is so widespread, adding iron to food has been tried several times. There have been technical difficulties, but these may now have been overcome. But anemia is not due solely to iron deficiencies, nor is it easily cured; effective programs that can be universally applied are still some way off.

It may sometimes be more effective to administer extra nutrients directly (orally or by injections). India and Bangladesh have done this with Vitamin A (at six-month intervals). But reaching those at major risk every six months is usually impracticable. Many countries have provided iron plus folic acid pills for pregnant women; others have reduced goiter by injecting people with iodized oil (a single injection provides protection for three to five years).

NUTRITION EDUCATION. There have been few, if any, striking successes, but the potential effect of nutrition education is so vast that the attempt to increase knowledge about nutrition requires continuing strong support. Clearly, education must be realistic: urging poor families to buy milk might be harmful if they can afford it only by eating fewer calories.

Recent research on breastfeeding has confirmed the value of breast milk, not only for nutrition but also for transferring to babies some of their mothers' immunity against infections. In contrast, bottle feeding in unhygienic conditions tends to increase the risk of infection, and is expensive. The role of advertising in promoting infant milk formulas in developing countries at the expense of breastfeeding has been questioned. In 1979, at a meeting sponsored by the WHO and UNICEF, several major multinational food firms agreed to curtail direct advertising of infant formulas in developing countries. An international code of marketing is now under consideration by the WHO.

Nutrition education will be cheaper the more it can be made
part of education in general, combined with information on family planning and health, or tied to community organizations or other credible and influential communications channels. In addition, several countries have experimented with rehabilitation centers for the severely malnourished, which not only save the child but show mothers how to feed their children at home. Others have experimented with mass media; relatively simple messages that do not risk being misinterpreted seem to have made people more aware of good practices, though they have not always been put into effect. The enormous amount of commercial advertising suggests that the value of mass media in promoting social programs has nowhere been adequately exploited.

PRIORITIES AND PLANNING. As in other areas, difficult choices must be made in tackling malnutrition. There are simply not enough financial, political or administrative resources to implement all the policies and programs outlined above. Some countries are attempting to assess relative priorities with the help of national food and nutrition plans. These should ideally be supported by successive sample surveys of nutrition status, food consumption and production patterns by income group and region—which can show, for example, the likely nutritional impact of alternative subsidy or production programs. Such plans, especially if effectively followed up, also offer a way to focus the attention of, say, agricultural ministries on the implications of nutritional priorities for agricultural research, pricing, extension and other policies.

FERTILITY

In the past 10 years striking progress has been made in understanding the causes and consequences of high birth rates, and in helping to resolve two controversial and important issues.

- The dispute between those alleging that family planning programs had little effect on birth rates and those alleging that family planning alone could reduce birth rates has been greatly narrowed if not wholly settled. The evidence overwhelmingly suggests that both social and economic conditions and family planning are important in determining birth rates, and that they are mutually reinforcing.

- Accumulating evidence clearly contradicts the fear that health programs, by lowering death rates, will boost population growth in the long term. Although fertility seemed unresponsive to falling death rates during the 1950s and 1960s, it has since declined in many poor countries—partly in response to lower death rates—and population growth is slowing down.

Demographic trends and projections

Figure 5.3 compares past and projected trends in birth rates and death rates in developed and developing countries. Two points need to be emphasized. One is the rapid population growth in the developing world, after death rates plummeted in the postwar years, and the continued rapid growth projected for the rest of this century. The second is the drop in birth rates, which began in the 1960s in the developing world, and the resulting gradual slowdown in the population growth rate since then—from a peak of about 2.4 percent in 1965 to 2.2 percent now.

Since 1965, birth rate declines of at least 10 percent have occurred in the world's two most populous countries, China and India, and in a number of other major developing countries—Indonesia, the Philippines, Thailand, Turkey and South Korea. Moreover, the recent rate of decline has been faster in today's developing world than it was in the 19th century in Europe and the United States. England and the Netherlands took about 50 years to reduce their birth rates from 35 to 20 per thousand—or about one point every three years;
Indonesia, Colombia and Chile have recently cut about one point every year from their crude birth rates—though generally from higher initial starting points.

Thus the comparison of current birth rates between the rich and poor worlds should not obscure the progress some developing countries are now making in lowering fertility. Higher incomes, more widespread education and the growing acceptability of family planning programs have begun to reduce birth rates in most middle-income countries in Latin America and East Asia, and in some countries and regions of South and Southeast Asia. With continued socioeconomic progress the fertility decline is projected to spread to the rest of South Asia and, with some delay, to Africa, during the 1980s and 1990s.

Even with these fertility declines, however, world population will continue to grow. By 2000, World Bank projections (which are broadly consistent with other projections, such as those of the United Nations) indicate it will have risen from the current estimate of 4.4 billion to about 6 billion; the population of the developing countries (including China) is projected to increase from 3.3 to 4.9 billion. India will grow from 672 to 974 million people; Brazil from 126 to 201 million; Nigeria from 85 to 153 million. These projections are based on the assumption that current rates of social and economic progress, including the spread of family planning and health and education services, will continue; if they change, so will population growth (see box).

It is instructive to consider the consequences of an acceleration of fertility decline such as to cause the rate of population growth in particular countries to fall to zero 10 years earlier than currently projected. The size of the resulting stationary populations would be reduced by, for example, 200 million in India, 50 million in Nigeria and 36 million in Mexico.

Poverty and high fertility
Poverty and high fertility are mutually reinforcing (see Figures 5.4 and 5.5). As discussed in Chapter 4 (page 39), rapid population growth is not always harmful. Reduction of population growth is not an end in itself; nor does it for every country or for every point in time increase the potential growth of income per person. But in the circumstances prevailing in most of the developing countries, rapid population growth impedes economic growth by reducing investment per person in physical capital and human skills. For individual families the number of children affects how much parents can invest in each one’s health and education—and thus in their future earning power.

Quantitative analysis suggests that social and economic factors (such as incomes, literacy and life expectancy) accounted for as much as 60 percent of the variation in

Alternative population projections

How sensitive are population projections to changes in fertility and mortality rates? To illustrate, compare two projections for Brazil. The current World Bank projection assumes that the total fertility rate (TFR)—a measure of births per woman, standardized for age distribution—will decline from 4.9 today to replacement level (a TFR of 2.2) by 2015. The Brazilian government has not officially recognized rapid population growth to be a problem, but it does permit family planning for health purposes—and the use of contraceptives (mainly privately bought) is increasing.

What would happen if fertility reached replacement level a decade earlier, in 2005? This is what the Bank projections assume for Colombia, a country with lower average incomes and roughly similar levels of literacy and life expectancy, but which already has a government-supported family planning program and significantly lower fertility (TFR = 3.7). For Brazil to match Colombia would require a sharp but not unprecedented fertility decline. Birth rates would need to fall from 36 per 1,000 people in 1978 to just below 20 in 2000—less than the fall of one point a year achieved in the past two decades by South Korea.

The figure illustrates the differences in the size and composition of the Brazilian population in 2020, under the alternative assumptions of replacement fertility in 2015 (Case I) or in 2005 (Case II). Two things to notice:

- Under either projection, the proportion of children in the population will decline substantially between 1980 and 2020. The current school-age (5-14) group of 32 million will increase by 10 million under Case I, only 4 million under Case II—compared with an increase of 14 million in the past 20 years, and 21 million in the past 40. In 2020 under Case II, children under 15 would constitute only 15 percent of the population, compared with 26 today.

- Even in Case II, the working-age population would more than double, from 70 million today to 163 million in 2020. On the other hand, the number of new entrants to the labor force would be considerably smaller. In 2020 Brazil will need to find about 4.5 million new jobs under Case I, but only 3.3 million under Case II.

Reaching replacement fertility in 2005, not 2015, would make a big difference in the eventual size of Brazil’s stationary population (reached about 70 years later); it would be 287 million rather than 345 million.
fertility changes among developing countries from 1960 to 1977. The strength of family planning programs explained an additional 15 percent.

The strength of family planning programs is influenced substantially by socioeconomic factors (which account for about three-quarters of its variation). This helps explain why family planning programs in countries with high fertility, such as Pakistan, often appear weak even after years in operation. This weakness is often written off as simply lack of government effort. What the results suggest, however, is that programs tend to flourish where their services are in demand. Nonetheless, government efforts are vital.

**Socioeconomic determinants of fertility**

Fertility is an area of human behavior where individual tastes, religion, culture and social norms all play a major role. Yet evidence from large groups of people suggests that differences in fertility can be largely explained by differences in their social and economic environment. What are the mechanisms by which low education, poor living conditions, high death rates and lack of health and family planning services lead to large families?

Consider the issue from the point of view of parents and potential parents. They receive pleasure from their children but have to spend time and money bringing them up. Children are also a form of investment—short-term if they work during childhood, and long-term if they support parents in disability or old age. Since children are a source of satisfaction, one might expect richer parents to want more of them. Yet the opposite is true, for several reasons.

The first is that the alternative uses of time—earning money, developing and using skills, leisure—become more attractive. This is particularly true for women, who are primarily responsible for bringing up children; as their opportunities for education and employment improve and their horizons expand, they often want a smaller family. Second, with increasing income, parents apparently prefer healthier and better-educated, but fewer children. They are more likely to want more education for their children when they believe that future job opportunities will be governed less by class origin or family background than by education and associated skills. Since this tends to be a consequence of development, it can help to explain falling fertility over time. Third, the children of the poor work at home and outside the home at an early age: for richer parents, children’s work is not so vital to family welfare.

If children help to support their parents in old age, the (low) current costs of raising children are a small price to pay. Where mothers command only low wages, the differences between children’s and mothers’ earnings may be small; work lost by the mother during a child’s infancy may be easily recouped by the child later on. Finally, in poor countries much of women’s traditional work—in agriculture, crafts and petty retailing—can be combined with looking after children.

The link between household poverty and high fertility is further reinforced by high rates of infant and child mortality; in poor families many births and the high probability of infant deaths go hand in hand. In the first place a mother who stops breastfeeding because her baby dies is biologically more likely to conceive another. Parents whose children die often try to replace them; and where high mortality is common, social norms
(which respond only gradually to changes in mortality) tend to encourage "insurance" against the expected loss of children. On the other hand, high fertility contributes to high infant and child mortality: many births, especially if they are close together, can weaken both mother and children.

**Family Planning.** The link between household poverty and high rates of childbearing is further cemented by the fact that the poor still have very limited access to modern and simple means of contraception. The contraceptives available are often expensive, particularly in relation to the incomes of the poor—and especially if they must be bought from private doctors. For a poor family, limiting the number of children may therefore mean sexual abstinence, illegal abortion, infanticide—or, at best, ineffective and difficult traditional contraception. In some circumstances, the psychological or financial costs of avoiding pregnancy may exceed the costs of having another child.

Family planning programs that are well designed and implemented may legitimize what relatives, friends, the community, the clan or village might otherwise have frowned upon. These social norms are often influential. Recent evidence indicates that declining fertility in 19th century Europe was not associated with economic factors in any consistent way. But it did follow a similar pattern across regions defined by a common language or culture—implying that the idea of limiting family size can affect fertility independently of specific economic change.

The same tendency can be seen today: even taking income and education differences into account, there are national and regional differences in fertility (Figure 5.4) that appear largely the product of cultural or religious differences. But culture never seems to have been an impenetrable barrier to fertility change. Once a high enough level of development has been reached, fertility has fallen without exception. Where there was a strong religious or cultural resistance to contraception, as in Ireland, fertility fell through delays in the age at marriage and an increase in lifelong celibacy, rather than through family planning.

**Age at Marriage.** Recent declines in birth rates partly reflect rising age of marriage among women. This has lowered the rate of population growth by lengthening the interval between generations, by shortening the period during which women are likely to have babies, and perhaps by giving women other interests beyond family and childbearing to take with them into married life.

Like marital fertility, age at marriage is strongly affected by social and economic conditions, including women's education and employment opportunities. The average age at marriage (corrected for the proportion of women who never marry) is 22 in the middle-income countries of Latin America and in Malaysia, Singapore and South Korea; but it is less than 20 (sometimes much less) in many Sub-Saharan African countries and in Nepal, India, Pakistan and Bangladesh.

Later marriage as a mechanism of fertility reduction has been most important in Asia. In the 1960s in South Korea and Peninsular Malaysia, changes in the proportion of women married accounted for about half as much of the decline in the crude birth rate as did changes in marital fertility—and were more important than marital fertility declines in Sri Lanka and the Philippines. China has placed great stress on delaying marriage in its program to reduce population growth.

In Latin America, later marriage has been a less important ingredient of declining fertility. This has been partly because average age at marriage was already high compared with Asia, partly because much of the fertility decline in such countries as Chile, Colombia and Costa Rica has been among older women, and partly because childbearing outside wedlock is more common. Fertility is generally high and age at marriage low throughout Africa and the Middle East.

**Population Policy and Family Planning Programs**

Lower fertility is not an end in itself, but one among several ways of improving human welfare. Nor are the benefits of family planning simply economic. Relatively few couples, even among the poor, want as many children as their natural fertility would allow—witness the hospitalization rates due to self-induced abortion in Latin America, and scattered evidence that some parents do not always do all they might to avoid infant deaths, particularly of daughters. Poor women are particularly helped by family planning services; so are children, who can benefit from a smaller family.

The case for the public provision of family planning services, and ensuring that the poor have access to them, is gradually becoming less controversial. Some 35 developing countries, with 78 percent of the developing world's people, have an official policy to reduce population growth. An additional 14 percent of the developing world's population lives in countries where family planning is supported for reasons of health and welfare—including the health benefits that come from fewer children.

Some countries have had striking
successes. In Thailand contraceptive use increased from 11 to 35 percent of rural married women between 1968 and 1975, and from 33 to 49 percent of urban married women. In Indonesia the government expanded its service in 1974 from a clinic-based approach, to one based in villages. It currently has 3,500 clinics, 25,000 village depots and 40,000 village family planning groups. The proportion of married women using modern contraceptives increased from 7.4 percent in 1974 to 18 percent in 1977; it was 0.2 percent in 1970.

Nor need a population policy be confined to the support of family planning programs. A few countries—most notably Singapore—have used tax and housing policies to discourage large families. Direct payments for sterilization have been an important part of the Indian program. China, which for several years has emphasized that later marriage and small families are patriotic, recently announced bonuses and preferences for one-child families, and tax and housing penalties for families with more than two children. Raising the legal minimum age at marriage (the median among all countries is still only 15) might also help, although efforts to date have not been particularly successful (with the possible exception of China).

Improving access to contraception. Before 1960 family planning services were provided largely by voluntary associations. Most programs were small and offered services through health centers and private clinics, promoting simple barrier methods (foam, condoms and diaphragms) and rhythm. In the 1960s oral contraceptives and the intrauterine device (IUD) became available—and sterilization and legal induced abortions became more common. These required clinical support and well-trained practitioners, making programs heavily dependent on the health system.

This has caused difficulties for many countries where medical facilities and personnel are too limited to provide adequate family planning coverage. But if they operate within the framework of the health service, middle-level health staff and people specially trained in family planning have proved effective substitutes for medical specialists. In Thailand and South Korea the use of para-medical personnel for screening patients and supplying contraceptive pills led to increased acceptance of these pills. Family planning aides in Pakistan and Bangladesh have learned to insert IUDs, and in India to carry out menstrual regulation (inducing abortion of possible but un confirmed pregnancies at an early stage). On a trial basis, they have been trained to perform sterilization.

Separate family planning services have not been so successful. The ad hoc systems (in Pakistan, for example) have at times involved ambitious programs of regular home visits to persuade people to plan their families, and to supply contraceptives. But without a satisfactory health network, it may be difficult to supervise the staff and provide more specialized advice or assistance to the few people who develop complications.

A promising alternative approach is to use other administrative networks. From time to time, India has had government personnel, such as teachers and tax collectors, recruiting people for sterilization—although this became unpopular through abuse. The successful family planning program in Indonesia (see box on page 80) has taken advantage of strong community organizations and made extensive use of village workers, with clinics to which people can be referred for further help.

Several countries have greatly increased the number of places where pills and condoms can be bought, often at subsidized rates. But simple and safe barrier methods (condoms, diaphragms and spermicides) are still neglected in many developing countries despite their renewed popularity in developed countries. Their use could sensibly be encouraged; research into ways of making them more practical in developing country settings is needed (see box).

Future priorities. Progress in reducing fertility will partly depend on increasing the demand for contraception—primarily through social and economic development that successfully reaches the poor, but also through the growing understanding that fertility is a matter of individual choice. It will also depend on providing effective family planning services. Both will be facilitated if contraceptives can be made more convenient and less prone to complications that need medical attention. And the importance of political commitment to a population policy should not be underestimated. Countries with a dual concern for social and economic advance and for family planning will be able to cut fertility rates substantially in the rest of this century, and beyond.

The seamless web
Chapter 4 stressed that education, health, nutrition and fertility significantly affect the incomes of the poor. This chapter has considered separately each of these main areas of human development, with special emphasis on the causes of change and the policies that can bring it about. But it is worth reiterating that the different elements of human development are key determinants of each other.
**Contraceptive technology**

Of the people who use some form of birth control (about two-thirds of them in developed and one-third in developing nations), roughly one-third are sterilized, about 20 percent use the pill, 15 percent the intrauterine device (IUD) and 13 percent the condom. Most of the remaining 19 percent use rhythm, abstinence, the diaphragm, contraceptive injections (which last one to three months), various types of spermicide and such traditional methods as withdrawal, postcoital douching and deliberate reliance on the anti-fertility action of breastfeeding. Though there is evidence of widespread illegal and self-induced abortion, safe and legal abortion is available in only a few countries, and publicly provided in even fewer.

The amounts spent on research in reproductive sciences and contraception have been small—less than 2 percent of total government spending on medical research in the mid-1970s. And public spending on applied contraceptive research has fallen as much as 50 percent since then. The (smaller) amount spent by pharmaceutical firms has probably also fallen, apparently because new methods are not expected to be profitable. Unless more is spent, new technologies—vaccines, menses-inducing drugs, pharmacologic methods for men, and much improved barrier contraceptives—though technically within reach, are unlikely to be developed or tested for many years.

Applied contraceptive research is still largely directed at female contraceptives (about nine times more was spent on female than on male methods in 1978), partly because basic research on the female reproductive system has been more successful. It is also geared almost exclusively to the search for new hormonal, drug-based and surgical procedures: more than $10 million was spent on these in both 1977 and 1978. In contrast, spending on the simpler barrier methods was less than $500,000—despite their potential for improvement (a biodegradable condom or a standardized plastic-based diaphragm, for example).

Present barrier methods are generally viewed as too ineffective and inconvenient for widespread use in developing countries—where sanitary conditions are poor, privacy is less, husband-wife communications are more formal and abortion as a backup is more difficult to obtain. In the United States, however, use of the pill is falling, that of the diaphragm increasing; consumer concern over the side-effects of both the pill and IUD has increased. Whether such concerns are well-founded—and on this there is no consensus—they are bound to spread to developing countries. In the 1980s, the efforts to extend services to more people may have to be complemented by a wider choice of methods.

---

**Figure 5.6  Policy and poverty**

- Land ownership and tenure
- Technology and research
- Domestic saving
- External capital
- Investment allocation
- Agriculture
- External trade
- Taxation and transfers
- Public health care
- Water supply, sanitation and housing
- Food production
- Subsidies/rations
- Food fortification
- Public education
- Family planning
- Incentives

The seamless web of interrelations constitutes the core of Figure 5.6; feeding into this core are the various areas in which policy affects poverty. The diagram is illustrative, and the policies shown are not the only determinants of poverty or of human development. As has been stressed, climate, culture, religion and natural resources all shape the environment in which development takes place and influence the choice of policies. So do political realities, administrative constraints and the world economy.

Some of the links are simply common sense: it is not surprising that the incomes of the poor significantly affect their health, education, nutrition and fertility. Poor people cannot afford decent food and health care; they are more likely to need their children’s meager earnings (or help in the household and fields) so that the children cannot go to school. And they feel more need to have large families to support them during
old age and disability. Average national income is obviously also significant, especially since it affects the tax base and hence the government’s ability to finance human development programs.

Some influences are less familiar. The effects of primary education have been stressed above in numerous contexts. For example, parents with a primary education are more likely to learn about (and be willing to try) improved health, hygiene and nutrition practices, thus reducing the chances that their children will become ill or malnourished. Educated people are more likely to have lower fertility: they more readily see the disadvantages of having too many children to feed and educate; they have more alternative sources of interest and satisfaction that compete with children for time and money; they are generally more willing to accept new ideas, such as the use of modern contraceptives, and to seek family planning advice. Because of the mother’s preeminent role in bearing and raising children, it is not surprising that her level of education is more important than the father’s.

Health and nutrition both affect whether children can attend school regularly enough to finish the primary years, and whether they have the mental and physical energy to learn. Malnutrition and disease have been found to be closely connected, each increasing the likelihood and severity of the other—with death often the end result. Better health plays a key role in the demographic transition to lower fertility: when the odds are greater that children will survive to support their parents in old age or disability, parents tend to have fewer children. Although it is possible (though not firmly established) that better nutrition may increase natural fecundity, its effects on the health, education and incomes of the poor all contribute indirectly to reduced fertility.

Lower fertility itself affects the other aspects of poverty. The spread and quality of education increases—because both the state and parents can afford to spend more on each child when there are fewer of them. Large families have higher infant and child death rates and a higher incidence of malnutrition—there is simply less food, money and time for each child.

It is also important to take a long view. Although a certain amount can be done with crash programs such as vaccination campaigns and adult literacy programs, sustained human development is usually a slow process. In general, a country’s level of health, education, nutrition or fertility at any given time largely reflects its level 10, 20 or even 50 years earlier. At any given level of family income, children are more likely to go to primary school if their parents have also done so; and because the home environment encourages learning, particularly in the preschool years, they are likely to do better in school as well.

Human development is thus transmitted from generation to generation in a virtuous circle; but equally, there is a vicious circle that sentences the children of deprived parents to deprivation themselves. Breaking out of the vicious circle into the virtuous one is the essence of human development.
6 Implementing human development programs: some practical lessons

This chapter concentrates on four key questions that invariably affect the way human development programs are organized, and how effective they are.

- Political support. This has been critical to the considerable success of human development programs in reaching the poor. Its absence also helps to explain some of the failures.

- Finance. Money alone will not produce human development. But a shortage of funds is a common, often binding constraint. So methods that reduce unit costs or raise new revenues have a considerable role to play in expanding services.

- Administration. For many programs, administrative and institutional capacities may be even scarcer than finance. Yet project experience shows that their importance is frequently overlooked.

- Demand. The way families and individuals respond to services is crucial to improving health, hygiene and nutrition; to whether children from poor families go to school or have to work instead; and to reducing fertility.

These four factors—like education, health, nutrition and fertility—are closely interlinked. For instance, financial and administrative constraints can be eased by political support, which in turn will be stronger if programs can be made less costly or administered more readily, or if there is a heavy demand for them. The links, though, are not all complementary: for example, paramedical workers have lower salaries than doctors, but they need more supervision.

**Human development needs political support**

Political support for human development cannot be taken for granted. The poor frequently are politically weak. They are often too sick, uneducated, geographically dispersed and busy to be politically active. Influential elites, particularly large landowners, may oppose human development programs if they feel that their power and status might be undermined. They might feel, for example, that educated children are less likely to settle for working in serf-like conditions on haciendas or plantations.

Even if there is no direct opposition, the extent and form of human development programs will generally be influenced by keen political competition for limited tax revenues. Because policymakers generally live in urban areas, as do the most politically active of the people who benefit from public services, these programs tend to suffer from urban bias (though reductions in urban social expenditures do not necessarily lead to increases in rural expenditures). But the health and education facilities available even to urban elites in poor countries are generally inferior to those available to the middle class in rich countries. A major political challenge of the 1980s will be to adapt and extend programs to the poor, particularly those in rural areas.

Despite the difficulties, it has usually been easier to obtain political support for health and education programs that benefit the poor—witness the large increases in school enrollment and life expectancy—than for policies of, say, land or tax reform. Why? Largely because, unlike land reform or increased taxation, more knowledge, health and vitality for the poor are not obtained by reducing them for someone else. Of course, such programs must be financed. The rich may have to pay more in taxes than they get in direct benefits. But they are often prepared to support human development, in part because it has a legitimacy that transcends culture, religion, ideology and class. This is particularly true if poor children are involved. The idea that all children should have a fair start—without the handicaps of disease, illiteracy and malnutrition—is widespread.

In some circumstances, moreover, everyone gains. Those who are not poor will benefit if endemic diseases are eradicated—prevention usually being cheaper than cure. Malaria control is an obvious example: the main beneficiaries are the rural poor, who are most likely to be infected. But mosquitoes that bite the infected poor may