for men in parts of Asia and Africa; and the very low survival rates of African-Americans, in comparison not only with those of whites in the U.S. but also with those of populations in some extremely poor countries.

Economic explanations of famine are often sought in measures of food production and availability. And public policy is frequently based on a country's aggregate statistics of the amount of food available per person, an indicator made prominent by Thomas Robert Malthus in the early 1800s. Yet contrary to popular belief, famine can result even when that overall indicator is high. Reliance on such simple figures often creates a false sense of security and thus prevents governments from taking measures to avert famine.

A more adequate understanding of famine requires examining the channels through which food is acquired and distributed as well as studying the entitlement of different sections of society. Starvation occurs because a substantial proportion of the population loses the means of obtaining food. Such a loss can result from unemployment, from a fall in the purchasing power of wages or from a shift in the exchange rate between goods and services sold and food bought. Information about these factors and the other economic processes that influence a particular group's ability to procure food should form the basis of policies designed to avoid famine and relieve hunger.

The Bangladesh famine of 1974 demonstrates the need for a broader appreciation of the factors leading to such a calamity. That year, the amount of food available per capita was high in Bangladesh: indeed, it was higher than in any other year between 1971 and 1976. But floods that occurred from late June until August interfered with rice transplantation (the process by which rice seedlings are moved from the scattered locations where they were established to neat rows in wet fields) and other agricultural activities in the northern district. Those disruptions, in turn, caused unemployment among rural laborers, who typically lead a hand-to-mouth existence. Bereft of wages, these workers could no longer buy much food and became victims of starvation.

Panic exacerbated the situation. Although the main rice crop, which had been only partly damaged by flooding, was not expected to be harvested until December, anticipation of a shortage led immediately to precautionary hoarding and to speculative stockpiling. All over the country, prices shot up sharply. As rice and other grains became more expensive, the food-buying ability of poor Bangladeshis plummeted. When food prices peaked in October, so also did the death toll.

At this point, the government, belatedly, began relief efforts on a large scale. Its response was delayed for several reasons, one being the suspension by the U.S. of food shipments, which resulted from a quarrel about Bangladesh's export of jute to Cuba. Yet one of the biggest obstacles was a false sense

of security evoked by high figures of food supply. Once relief was set in motion, the market began to readjust to a more realistic assessment of the winter harvest: the loss of crops was much more moderate than had been earlier assumed. By November, food prices started coming down; most relief centers were closed by the end of the month. The famine was mostly over before the partly damaged crop was even scheduled to be harvested.

As mentioned earlier, food levels per capita in Bangladesh were high in this year (because an excellent crop had been harvested in December 1973). The occurrence of this famine illustrates how disastrous it can be to rely solely on food supply figures. Food is never shared equally by all people on the basis of total availability. In addition, private and commercial stocks of produce are offered to or withdrawn from the market in response to monetary incentives and expectation of price changes.

Famine has often taken place when statistics have shown little or no decline in food supply. During the Bengal famine of 1943, for instance, the diminished purchasing power of rural laborers' wages initiated widespread starvation. Similarly, in 1973 a famine in the Ethiopian province of Wollo was caused by a locally intense drought that impoverished the local population but did not substantially reduce food production in the nation overall. Prices were often lower in Wollo than elsewhere in the country because the purchasing ability of the province's population was so reduced; some food, in fact, moved out of the famine-stricken region to more affluent areas. (This tragic turn of events also took place during the 1840s, when food was shipped from a starving Ireland to a prosperous England.)

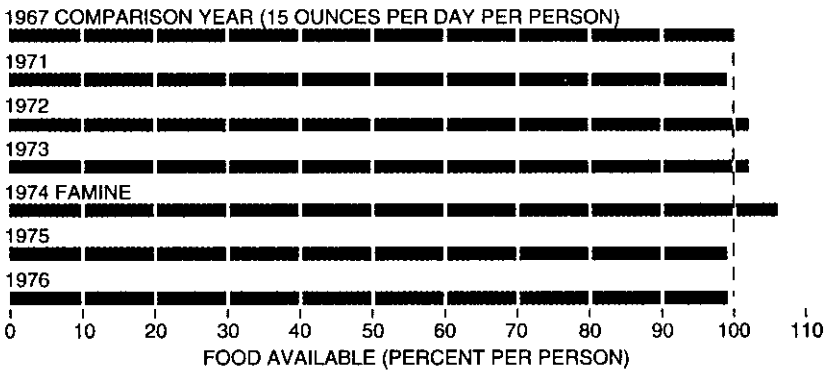
There are several ways to prevent famine. In Africa and Asia, growing more food would obviously help, not only because it would reduce the cost of food but also because it would add to the economic means of populations largely employed in

The Bangladesh famine of 1974 took place even though more food was available per person that year than in any other year between 1971 and 1976. (Food availability per year is indexed in relation to the base year of 1967.)

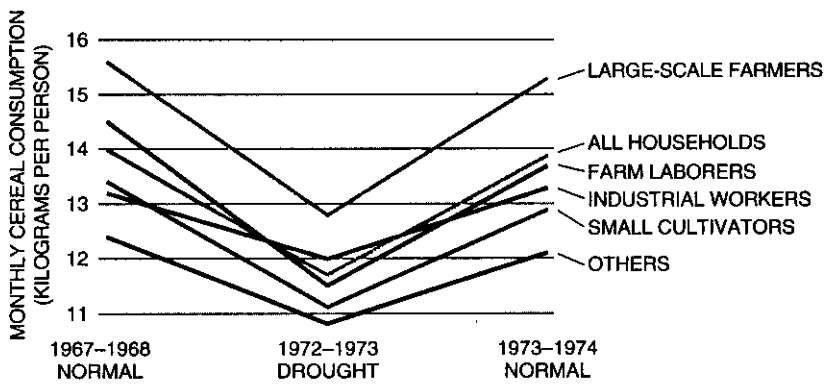
Maharashtra, India, prevented famine during a drought by establishing public works programs, which provided income to the needy. Everyone's consumption of cereal fell: the shortage was shared by all.

Botswana, Zimbabwe and Cape Verde produced less food in 1983–1984 than in earlier years but did not experience famine, because they implemented public programs. Sudan and Ethiopia, which had less severe declines, did far less and suffered more.

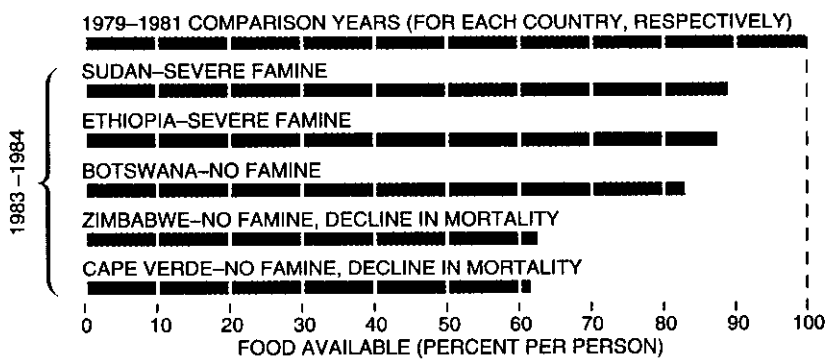
FAMINE AND FOOD SUPPLY IN BANGLADESH



DROUGHT AND CEREAL CONSUMPTION IN MAHARASHTRA



FAMINE AND FOOD AVAILABILITY IN FIVE AFRICAN NATIONS



producing food. Enhancing production would require providing incentives to make investments in farming worthwhile. It would also necessitate policies such as expanding irrigation and encouraging technological innovation (which is much neglected in Africa).

Augmenting food production, however, is not the only answer. Indeed, given the variability of the weather, concentrating too much of a nation's resources on growing more food can increase the population's vulnerability to droughts and floods. In sub-Saharan Africa, in particular, there is a strong need for the diversification of production, including the gradual expansion of manufacturing. If people have the economic means, food can be purchased—if necessary, from abroad.

No matter how successful the expansion of production and diversification may be in many African and Asian countries, millions of people will continue to be devastated by floods, droughts and other disasters. Famine can be averted in these situations by increasing the purchasing power of the most affected groups—those with the least ability to obtain food. Public employment programs can rapidly provide an income. The newly hired laborers can then compete with others for a share of the total food supply. The creation of jobs at a wage does, of course, raise prices: rather than letting the destitute starve, such practice escalates the total demand for food. That increase can actually be beneficial, because it brings about a reduction in consumption by other, less affected groups. This process distributes the shortage more equitably, and the sharing can deter famine.

Such public works projects to avert famine would not typically impose an extraordinary financial burden on the government of a poor nation. Even though the absolute number of famine victims can be high, they tend to make up a small proportion of society: famine usually afflicts less than 5 to 10 percent of the population. Because those who starve are also among the poorest, their share of income or of food consumption is often between 2 and 4 percent. Thus, the fiscal resources needed to re-create their lost incomes are not impossibly exacting.

The success of the public employment approach to famine prevention is well illustrated. In the Indian state of Maharashtra, a series of severe droughts between 1972 and 1973 led to extensive agricultural unemployment and to a halving of the amount of food yielded. Public works programs—for example, the building of roads and wells—saved the affected laborers from starving. They could then compete with others for limited food. Although the average amount of food available per person in Maharashtra was, at that time, much lower than it was in the Sahel countries (Burkina Faso, Mauritania, Mali, Niger, Chad and Senegal), there was little starvation in Maharashtra. The Sahel, however, experienced widespread famine, because the shortage was not distributed so equally.

India has been able to avoid famine in recent years largely through such methods. Its last severe famine took place in 1943, four years before independence from the British. Although food supplies dropped drastically in 1967, 1973, 1979 and 1987 because of natural disasters, severe famines were averted by recapturing the lost purchasing power of the threatened segments of the population.

Preventing famine through cash income programs differs from the standard practice of herding people into relief camps and trying to feed them. That approach, often used in Africa, tends to be slower and can put an unbearable organizational burden on government officials. Furthermore, packing people in camps away from home can disrupt normal economic operations, such as cultivation and animal husbandry, which, in turn, undermines future production. Such herding can also upset family life. Finally, and not least, the camps often become breeding grounds for infectious diseases.

In contrast, paying cash wages for public employment does not threaten the economic and social well-being of those being assisted. It builds on the existing production and market mechanisms and draws on the efficiency of traders and transporters. This approach can actually strengthen the economic infrastructure rather than weakening it.

Inevitably, beneficial fiscal policies are closely linked to politics. Although the public works approach relies on the market, it is not a free-market policy: it requires the government to intervene by offering employment. Public ownership of at least minimal stockpiles of food can also be helpful. The stores can give the government a credible threat in case traders attempt to manipulate the market. If merchants artificially withhold supplies in an effort to drive up prices, the government can retaliate by flooding the market to cause collapse of the prices and profits.

Famine is entirely avoidable if the government has the incentive to act in time. It is significant that no democratic country with a relatively free press has ever experienced a major famine (although some have managed prevention more efficiently than others). This generalization applies to poor democracies as well as to rich ones. A famine may wipe out millions of people, but it rarely reaches the rulers. If leaders must seek reelection and the press is free to report starvation and to criticize policies, then the rulers have an incentive to take preemptive action. In India, for instance, famine ceased with independence. A multiparty democratic system and a relatively unfettered press made it obligatory for the government to act. In contrast, even though postrevolutionary China has been much more successful than India in economic expansion and in health care, it has not been able to stave off famine. One occurred

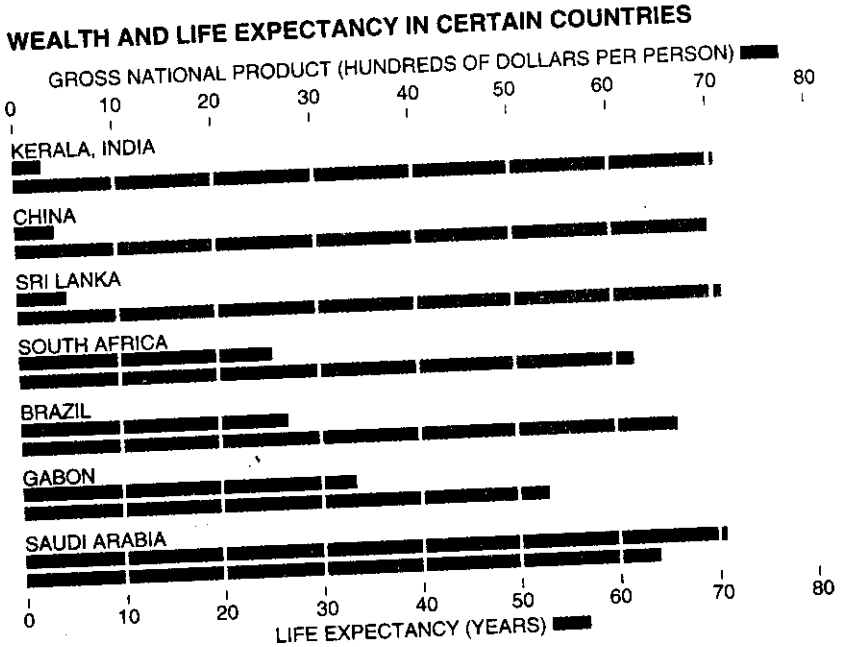
SOMALIAN FAMINE VICTIM stands with an empty bucket, waiting for food. Local wars and the breakdown of law and order have disrupted the economy in Somalia, impoverishing many people. Earlier military dictatorships did little to prevent famines: as a result of the suppression of opposition parties and a muzzled press, these governments were free to be irresponsible.

between 1958 and 1961, after the agricultural program of the Great Leap Forward failed. The lack of political opposition and a free press allowed the disastrous policies to continue for three more years. The death toll consequently climbed to between 23 million and 30 million people.

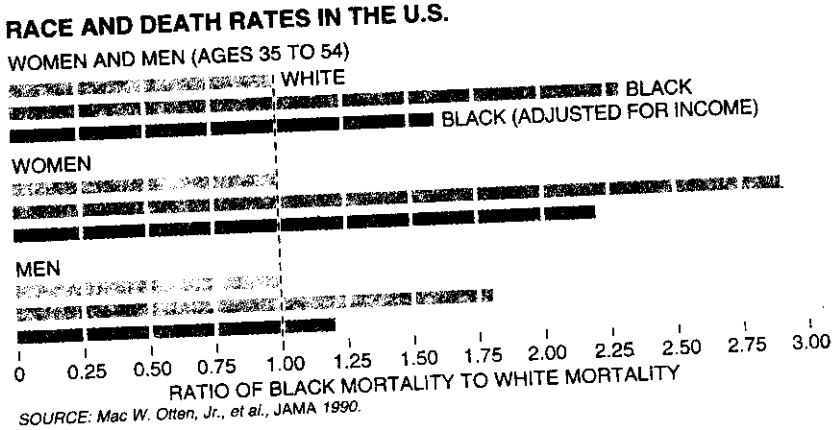
Many countries in sub-Saharan Africa, among them Somalia, Ethiopia and Sudan, have paid a heavy price for military rule. Conflicts and wars are conducive to famine not only because they are economically destructive but also because they encourage dictatorship and censorship. Relatively democratic sub-Saharan countries, such as Botswana and Zimbabwe, have, in general, been able to forestall famine. Of course, even an undemocratic poor country can avoid famine through luck: a crisis might not arise or some benevolent despot might implement effective famine-relief policies. But a democracy is a more effective guarantee of timely action.

Famine mortality data draw attention to the failures of certain economic and political structures. Chronically high mortality rates reveal less extreme, but more persistent, failures. The economic policies associated with low infant mortality and increasing life expectancy vary considerably. Several countries that dramatically reduced infant mortality in the years between 1960 and 1985 experienced unprecedented rapid economic

Wealthy nations do not necessarily have greater life expectancies than do poor countries. For instance, Saudi Arabia is rich but has a lower life expectancy than the Indian state of Kerala. Through public outlays for education, health and nutrition, Kerala has extended life expectancy, despite a very low gross national product.

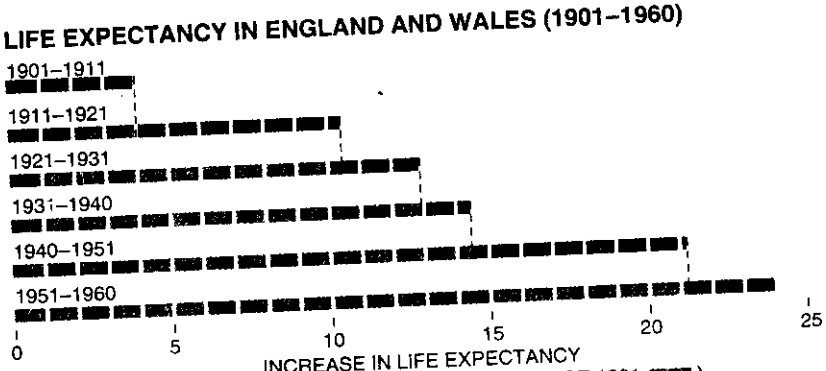


Mortality rates vary by race in the U.S. Black men between the ages of 35 and 54 are 1.8 times more likely to die than are white men of the same age. And black women in this group are almost three times more likely to die than are white women of the same age.



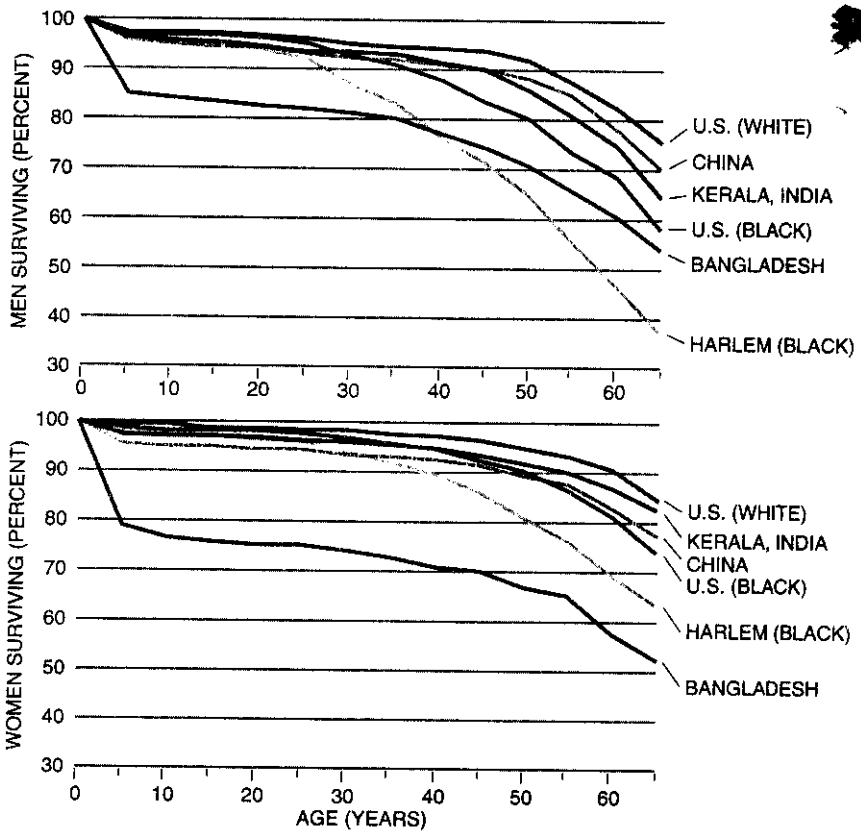
SOURCE: Mac W. Otten, Jr., et al., JAMA 1990.

Life expectancy in England and Wales increased most dramatically in the decades of the two world wars largely because of the expansion of health care services and guaranteed food rationing for all citizens.



SOURCE: S. Preston, N. Keyfitz, R. Schoen, Causes of Death: Life Tables for National Populations, 1972.

VARIATIONS IN SURVIVAL RATES, BY SEX AND REGION



SOURCE: Data for Harlem and Bangladesh, Colin McCord and Harold Freeman, NEJM 1990; for others, official population statistics from the 1980s. Data are the most recent available.

The survival chances of the average African-American are better than those of an African-American living in Harlem but are unfavorable when compared with those of U.S. whites and those of the citizens of China and Kerala, who have much lower incomes. Although black women fare better than the men do, they too fall behind women in Kerala and China as they age.

growth. They include Hong Kong, Singapore and South Korea. These nations are now rich in terms of GNP. But also on the success list are several nations that are still poor: China, Jamaica and Costa Rica, among others.

The fact that a poor country can achieve improvements in health care and life expectancy that, in many ways, rival those of wealthier nations has tremendous policy implications. This ability challenges the often-aired opinion that a developing country cannot afford expenditures for health care and education until it is richer and more financially sound. This view ignores relative cost. Education and health care are labor intensive, as are many of the most effective medical services. These services cost much less in a cheap labor economy than they do in a wealthier country. So, although a poor country has less to spend on these services, it also needs to spend less on them.

The long-standing efforts of Sri Lanka and the Indian state of Kerala (whose population of 29 million is bigger than Canada's) illustrate the merits of public spending for education and health. Sri Lanka promoted literacy and schooling programs early in this century. It massively expanded medical services in the 1940s, and in 1942 it started distributing free or subsidized rice to bolster the nutritional intake of undernourished people. In 1940 the death rate was 20.6 per 1,000; by 1960 it had fallen to 8.6 per 1,000.

Similar changes took place in Kerala. Despite a per capita GNP that is considerably less than the Indian average, life expectancy in Kerala now is more than 70 years. Such an accomplishment in the face of very low income and poverty is the result of the expansion of public education, social epidemiological care, personal medical services and subsidized nutrition.

This analysis does not contradict the valuable contribution that an increasing GNP can make to raising life expectancy. Clearly, economic soundness can help a family obtain better nutrition and medical care. Furthermore, economic growth can augment the government's ability to provide for public education, health care and nutrition. But the results of economic growth are not always channeled toward such programs. Many nations—such as Saudi Arabia, Gabon, Brazil and South Africa—have much worse records on education, health and welfare than do other countries (or states) that have much lower GNPs but more public-oriented policy, Sri Lanka, China, Costa Rica and Kerala, among them. The crucial point is that poor countries need not wait to get rich before they can combat mortality and raise life expectancy.

The role of public policy in lengthening life expectancy is, of course, not peculiar to the Third World alone. Public intervention in health, education and nutrition has historically played a substantial part in the rise in longevity in the West and in Japan. In England and Wales, the decades of World War I and World War II were characterized by the most significant increase in life expectancy found in any decade this century. War efforts and rationing led to a more equitable distribution of food, and the government paid more attention to health care—even the National Health Service was set up in the 1940s. In fact, these two decades had the slowest growth of gross domestic product per capita: indeed, between 1911 and 1921, growth of GDP was negative. Public effort rather than personal income was the key to increasing life expectancy during those decades.

Analyzing mortality data can help in the economic evaluation of social arrangements and of public policy. This perspective can be particularly useful in elucidating crucial aspects of social inequality and poverty and in identifying policies that can counter them. One of the more immediate problems that must be faced in the U.S. is the need for a fuller understanding of the nature of economic deprivation. Income is obviously a major issue in characterizing poverty, but the discussion of American poverty in general and of African-American poverty in particular has frequently missed important dimensions because of an overconcentration on income.

As has often been noted, two fifths of the residents of New York City's cen-

tral Harlem live in families whose income levels lie below the national poverty line. This fact is shocking, but that poverty line, low though it is in the U.S. context, is many times the average income of, say, a family in Bangladesh—even after correcting for differences in prices and purchasing power. In some ways, a more telling view of poverty in Harlem as compared with that in Bangladesh can be found in mortality statistics. Colin McCord and Harold P. Freeman of Columbia University and Harlem Hospital have already noted that black men in Harlem are less likely to reach the age of 65 than are men in Bangladesh. In fact, Harlem men fall behind Bangladeshi men in terms of survival rates by the age of 40.

These comparisons can be enhanced by scrutinizing the situations in China and Kerala, poor economies that have undertaken much more thorough efforts in public health and education than has Bangladesh. Even though China and Kerala have higher infant mortality rates, their survival rates for teenage and older males are better than Harlem's. The higher mortality of men in Harlem partly reflects deaths caused by violence. Violence is a significant part of social deprivation in the U.S., even though it is not the only cause of the high mortality in Harlem. Women in Harlem fall behind Chinese and Keralan women in survival rates by the ages of 35 and 30, respectively.

Moreover, a similar problem plagues African-Americans in general. Again, black people in the U.S. have lower infant mortality rates than the populations of China and Kerala. But as we move up the age scale, black women and men fall behind the women and men of Kerala and China, in terms of the percent surviving. The nature and extent of the deprivation among African-Americans cannot be adequately understood when they are measured by the yardstick of income. According to that scale, African-Americans are poor in comparison with U.S. whites, but they are immensely richer than Chinese and Keralan citizens. On the other hand, in terms of life and death, African-Americans are less likely to survive to a ripe old age than are people in some of the poorest Third World countries.

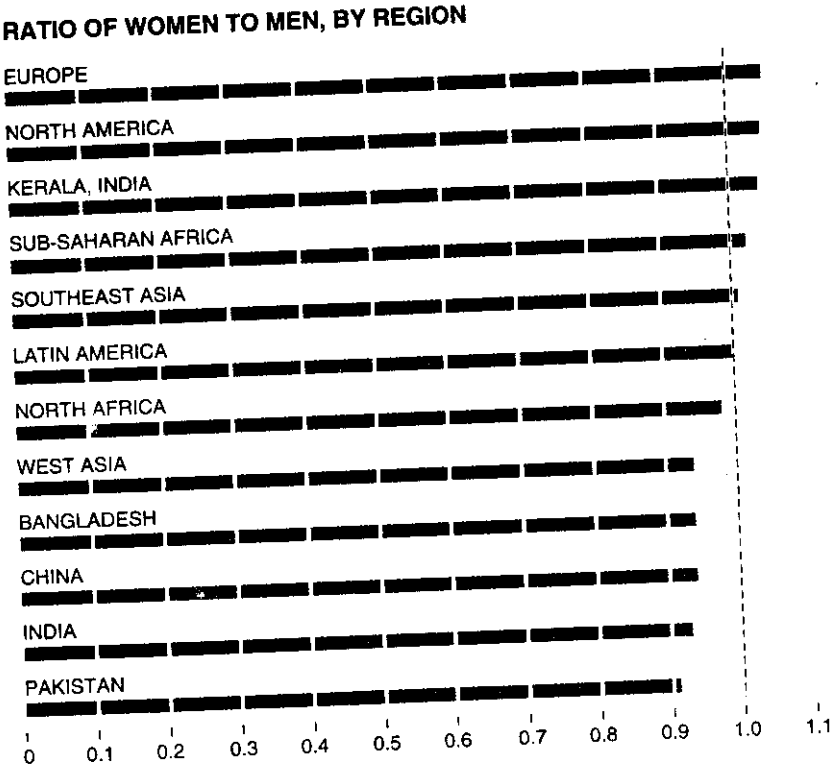
Another feature of racial inequality revealed by the mortality data is the relative deprivation of African-American women. In some ways, they fare worse than black men. The gaps between white and black mortality for the ages between 35 and 54 years appears to be much wider for black women than for black men. The differences between blacks and whites relate partly to differences in their incomes. But even after correcting for variations in incomes, some of the discrepancy remains. For black women the bulk of the mortality differences cannot be attributed to income gaps at all.

Mortality information can also be used to investigate an elementary manifestation of sexual bias. One striking demographic feature of the modern world is the enormous geographic variation in the ratio of females to males. Medical evidence suggests that, given similar care, women tend to have lower mortality than do men. Even in the uterus, female fetuses are less prone to miscarriage. Although males outnumber females at birth and at conception, women outnumber men in Europe and North America by about 5 percent.

In many parts of the developing world, however, the ratios of females to males are quite different: whereas that ratio is 1.02 in sub-Saharan Africa, it is 0.98 in North Africa, 0.94 in China, Bangladesh and West Asia, 0.93 in India and 0.91 in Pakistan. To form an idea of the magnitudes involved, it is useful to ask such questions as: If countries such as China had the female-male ratio that, say, sub-Saharan Africa has, how many more women would there be? If we do use the sub-Saharan African ratio as the benchmark, as Jean Drèze of the Delhi School of Economics and I did, then it would appear that more than 100 million women were "missing" in the female-deficit countries: 44 million missing in China alone, 37 million in India. Other estimates, using other benchmarks, have placed the number between 60 million and 90 million.

The phenomenon of the missing women reflects a history of higher mortality for females and a staunch antifemale bias in health care and nutrition in these countries. Jocelyn Kynch of the University of Oxford and I examined hospital records in Bombay. We found that women had to be more seriously ill than men did in order to be taken to the hospital. Another study I conducted, with Sunil Sengupta of Visva-Bharati

More males are born than females, but females have lower mortality: thus, they tend to outnumber males if both sexes receive similar health care. In Europe and North America, the ratio of women to men is about 1.05, although this number is inflated because of the loss of men in past wars. In some other countries, women have not had equal access to health care.



University, indicated systematic bias in nutritional health care in favor of boys in two West Bengal villages.

Although historical and cultural factors lie behind this bias, economic institutions are involved as well. Evidence suggests that the ability of women to earn an income and to enter occupations, especially in more skilled jobs, outside the home, enhances their social standing and in turn influences the care they receive within the family. Working outside the home also gives women exposure to the world and, sometimes, more of an opportunity to question the justice of the prevailing social and economic order. Literacy, education, land ownership and inheritance can also improve the overall status of women.

In Kerala, economics has helped better the position of women. Not only does the state have a large proportion of working women in occupations that command respect, but, as described earlier, it has a well-developed system of education, with high literacy rates for both sexes, a widespread network of health services and, for a substantial and influential segment of the population, a tradition of matrilineal inheritance. The female-male ratio of the population is now about 1.04 (although it would be reduced by a little if one took into account men working outside the state). Life expectancy in Kerala at birth is 73.0 years for females, 67.5 years for males.

That average life expectancy is nearly matched by China, but women fare relatively better in Kerala. The Chinese government has strived to eradicate sexual inequality, and China does have a high rate of female employment. The level of female literacy is, however, much lower than that in Kerala. The high female infant mortality in China may also be partly connected with the impact of compulsory birth control measures—the partial imposition of the so-called one-child policy—in a society in which male preference is overriding.

This article is not directly concerned with fertility and family planning, but I would like to note that compulsory birth control does have some dangers with regard to sexual bias. There are excellent arguments, based on considerations of liberty and freedom, against such compulsion in the first place. But the possible effect of such a measure on female mortality adds another dimension to the debate. Chinese success in slowing the birth rate is often cited in discussions about the need for forceful family planning in the Third World. It is true that the Chinese birth rate of 21 per 1,000 compares very favorably with India's 30 per 1,000 (and the average of 38 per 1,000 seen in low-income countries other than China and India). Yet Kerala's birth rate of 20 per 1,000 is comparable to China's of 21 per 1,000—without any compulsory birth control policy and without the problem of female infant mortality.

AFRICAN-AMERICANS who live in inner-city environments similar to the one portrayed in this photograph have less favorable chances for survival than do the citizens of Kerala. This discrepancy highlights the failure of U.S. policies to make equitable arrangements for public education, health care, nutrition and social peace.

Considerable demographic evidence indicates that declines in birth rates quite often follow declines in death rates. This pattern relates to a decreasing urgency to have many children to ensure survivors. It also reflects the interdependence between birth control and death control: providing people with access to contraception can be effectively combined with the delivery of medical care. As the death rate has fallen in Kerala, so has the birth rate: from 44 per 1,000 between 1951 and 1961 to 20 per 1,000 between 1988 and 1990.

Mortality data provide a gauge of economic deprivation that goes well beyond the conventional focus on income and financial means. The assessment of economic achievement in terms of life and death can draw attention to pressing questions of political economy. This perspective can help in providing a fuller understanding of famine, health care and sexual inequality, as well as poverty and racial inequality, even in wealthy nations such as the U.S. The need to widen the scope of conventional economics to include the economics of life and death is no less acute in the U.S. than it is in famine-stricken sub-Saharan Africa.

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