PART I

Private Lives

2

A Billion Hungry People?

For many of us in the West, poverty is almost synonymous with hunger. Other than major natural catastrophes such as the Boxing Day tsunami in 2004 or the Haiti earthquake in 2010, no single event affecting the world's poor has captured the public imagination and prompted collective generosity as much as the Ethiopian famine of the early 1980s and the resulting "We Are the World" concert in March 1985. More recently, the announcement by the UN Food and Agriculture Organization (FAO) in June 2009 that more than a billion people are suffering from hunger[1] grabbed the headlines, in a way that the World Bank's estimates of the number of people living under a dollar a day never did.

This association of poverty and hunger is institutionalized in the UN's first Millennium Development Goal (MDG), which is "to reduce poverty and hunger." Indeed, poverty lines in many countries were originally set to capture the notion of poverty based on hunger—the budget needed to buy a certain number of calories, plus some other indispensable purchases (such as housing). A "poor" person was essentially defined as someone without enough to eat.

It is no surprise, therefore, that a large part of governments' effort to help the poor is posited on the idea that the poor desperately need

food, and that quantity is what matters. Food subsidies are ubiquitous in the Middle East: Egypt spent $3.8 billion in food subsidies in 2008–2009 (2 percent of the GDP).[2] Indonesia has the Rakshin Program, which distributes subsidized rice. Many states in India have a similar program. In Orissa, for example, the poor are entitled to 55 pounds of rice a month at about 1 rupee per pound, less than 20 percent of the market price. Currently, the Indian parliament is debating instituting a Right to Food Act, which would allow people to sue the government if they are starving.

The delivery of food aid on a massive scale is a logistical nightmare. In India, it is estimated that more than one-half of the wheat and over one-third of the rice get "lost" along the way, including a good fraction that gets eaten by rats.[3] If governments insist on such policy despite the waste, it is not only because hunger and poverty are assumed to go hand in hand: The inability of the poor to feed themselves properly is also one of the most frequently cited root causes of a poverty trap. The intuition is powerful: The poor cannot afford to eat enough; this makes them less productive and keeps them poor.

Pak Solhin, who lives in a small village in the province of West Java, Indonesia, once explained to us exactly how such a poverty trap worked.

His parents used to have a bit of land, but they also had thirteen children and had to build so many houses for each of them and their families that there was no land left for cultivation. Pak Solhin had been working as a casual agricultural worker, which paid up to 10,000 rupiah per day ($2 USD PPP) for work in the fields. However, a recent hike in fertilizer and fuel prices had forced farmers to economize. According to Pak Solhin, the local farmers decided not to cut wages but to stop hiring workers instead. Pak Solhin became unemployed most of the time. In the two months before we met him in 2008, he had not found a single day of agricultural labor. Younger people in this situation could normally find work as construction workers. But, as he explained, he was too weak for the most physical work, too inexperienced for more skilled labor, and at forty, too old to be an apprentice: No one would hire him.

As a result, Pak Solhin's family—he and his wife, and their three children—were forced to take some drastic steps to survive. His wife left for Jakarta, approximately 80 miles away, where, through a friend, she found a job as a maid. But she did not earn enough to feed the children. The oldest son, a good student, dropped out of school at twelve and started as an apprentice on a construction site. The two younger children were sent to live with their grandparents. Pak Solhin himself survived on about 9 pounds of subsidized rice he got every week from the government and on fish that he caught from the edge of a lake (he could not swim). His brother fed him once in a while. In the week before we last spoke with him, he had had two meals a day for four days, and just one for the other three.

Pak Solhin appeared to be out of options, and he clearly attributed his problem to food (or, more precisely, the lack of it). It was his opinion that the landowning peasants had decided to fire their workers instead of cutting wages because they thought that with the recent rapid increases in food prices, a cut in wages would push workers into starvation, which would make them useless in the field. This is how Pak Solhin explained to himself the fact that he was unemployed. Although he was evidently willing to work, lack of food made him weak and listless, and depression was sapping his will to do something to solve his problem.

The idea of a nutrition-based poverty trap, which Pak Solhin explained to us, is very old. Its first formal statement in economics dates from 1958.[4]

The idea is simple. The human body needs a certain number of calories just to survive. So when someone is very poor, all the food he or she can afford is barely enough to allow for going through the motions of living and perhaps earning the meager income that the individual originally used to buy that food. This is the situation Pak Solhin saw himself in when we met him. The food he got was barely enough for him to have the strength to catch some fish from the bank.

As people get richer, they can buy more food. Once the basic metabolic needs of the body are taken care of, all that extra food goes into building strength, allowing people to produce much more than they need to eat merely to stay alive.

This simple biological mechanism creates an S-shaped relationship between income today and income tomorrow, very much as in Figure 1 in the previous chapter: The very poor earn less than they need to be able to do significant work, but those who have enough to eat can do serious agricultural work. This creates a poverty trap: The poor get poorer, and the rich get richer and eat even better, and get stronger and even richer, and the gap keeps increasing.

Although Pak Solhin's logical explanation of how someone might get trapped in starvation was impeccable, there was something vaguely troubling about his narrative. We met him not in war-infested Sudan or in a flooded area of Bangladesh, but in a village in prosperous Java, where, even after the increase in food prices in 2007–2008, there was clearly plenty of food available, and a basic meal did not cost much. He was clearly not eating enough when we met him, but he was eating enough to survive; why would it not pay someone to offer him the extra bit of nutrition that would make him productive in return for a full day's work? More generally, although a hunger-based poverty trap is certainly a logical possibility, how relevant is it in practice, for most poor people today?

ARE THERE REALLY A BILLION HUNGRY PEOPLE?

One hidden assumption in our description of the poverty trap is that the poor eat as much as they can. And indeed, it would be the obvious implication of an S-shaped curve based on a basic physiological mechanism: If there was any chance that by eating a bit more, the poor could start doing meaningful work and get out of the poverty trap zone, then they should eat as much as possible.

Yet, this is not what we see. Most people living with less than 99 cents a day do not seem to act as if they are starving. If they were, surely they would put every available penny into buying more calories. But they do not. In our eighteen-country data set on the lives of the poor, food represents from 45 to 77 percent of consumption among the rural extremely poor, and 52 to 74 percent among their urban counterparts.[5]

It is not because all the rest is spent on other necessities: In Udaipur, for example, we find that the typical poor household could spend up to 30 percent more on food than it actually does if it completely cut expenditures on alcohol, tobacco, and festivals. The poor seem to have many choices, and they don't elect to spend as much as they can on food.

This is evident from looking at how poor people spend any extra money that they happen upon. Although they clearly have some unavoidable expenses (they need clothes, medicines, and so forth) to take care of first, if their livelihoods depended on getting extra calories, one would imagine that when a little bit more spendable money is available, it would all go into food. The food budget should go up proportionally faster than total spending (since both go up by the same amount, and food is only a part of the total budget, it increases by a bigger proportion). However, this does not seem to be the case. In the Indian state of Maharashtra, in 1983 (much before India's recent successes—a majority of households then lived on 99 cents per person per day or less), even for the very poorest group, a 1 percent increase in overall expenditure translated into about a 0.67 percent increase in the total food expenditure.[6] Remarkably, the relationship was not very different for the poorest individuals in the sample (who earned about 50 cents per day per person) and the richest (who earned around $3 per day per person). The Maharashtra case is pretty typical of the relationship between income and food expenditures the world over: Even among the very poor, food expenditures increase much less than one for one with the budget.

Equally remarkable, even the money that people spend on food is not spent to maximize the intake of calories or micronutrients. When very poor people get a chance to spend a little bit more on food, they don't put everything into getting more calories. Instead, they buy better-tasting, *more expensive* calories. For the poorest group in Maharashtra in 1983, out of every additional rupee spent on food when income rose, about half went into purchasing more calories, but the rest went into more expensive calories. In terms of calories per rupee, the millets (*jowar* and *bajra*) were clearly the best buy. Yet only about two-thirds of

the total spending on grains was on these grains, while another 30 percent was spent on rice and wheat, which cost on average about twice as much per calorie. In addition, the poor spent almost 5 percent of their total budget on sugar, which is both more expensive than grains as a source of calories and bereft of other nutritional value.

Robert Jensen and Nolan Miller found a particularly striking example of the "flight to quality" in food consumption.[7] In two regions of China, they offered randomly selected poor households a large subsidy on the price of the basic staple (wheat noodles in one region, rice in the other). We usually expect that when the price of something goes down, people buy more of it. The opposite happened. Households that received subsidies for rice or wheat consumed *less* of those two items and ate more shrimp and meat, even though their staples now cost less. Remarkably, overall, the caloric intake of those who received the subsidy did not increase (and may even have decreased), despite the fact that their purchasing power had increased. Neither did the nutritional content improve in any other sense. The likely explanation is that because the staple formed such a large part of the household budget, the subsidies had made them richer. If the consumption of the staple is associated with being poor (say, because it is cheap but not particularly tasty), feeling richer might actually have made them consume *less* of it. Once again, this suggests that at least among these very poor urban households, getting more calories was not a priority: Getting better-tasting ones was.[8]

What is happening to nutrition in India today is another puzzle. The standard media story about it is about the rapid rise of obesity and diabetes as the urban upper-middle classes get richer. However, Angus Deaton and Jean Dreze have shown that the real story of nutrition in India over the last quarter century is not that Indians are becoming fatter: It is that *they are in fact eating less and less.*[9] Despite rapid economic growth, there has been a sustained decline in per capita calorie consumption; moreover, the consumption of all other nutrients except fat also appears to have declined among all groups, even the poorest. Today, more than three-fourths of the population live in households whose per capita calorie consumption is less than 2,100 calories in urban areas and 2,400 in rural areas—numbers that are often cited as

"minimum requirements" in India for individuals engaged in manual labor. It is still the case that richer people eat more than poorer people. But at all levels of income, the share of the budget devoted to food has declined. Moreover, the composition of the food basket has changed, so that the same amount of money is now spent on more expensive edibles.

The change is not driven by declining incomes; by all accounts, real incomes are increasing. Yet, though Indians are richer, they eat so much less at each level of income that they eat less on average today than they used to. Nor is it because of rising food prices—between the early 1980s and 2005, food prices declined relative to the prices of other things, both in rural and urban India. Although food prices have increased again since 2005, the decline in calorie consumption happened precisely when the price of food was going down.

So the poor, even those whom the Food and Agriculture Organization would classify as hungry on the basis of what they eat, do not seem to want to eat much more even when they can. Indeed, they seem to be eating less. What could be going on?

The natural place to start to unravel the mystery is to assume that the poor must know what they are doing. After all, they are the ones who eat and work. If they could indeed be tremendously more productive, and earn much more by eating more, then they probably would when they had the chance. So could it be that eating more doesn't actually make us particularly more productive, and as a result, there is no nutrition-based poverty trap?

One reason the poverty trap might not exist is that most people have enough to eat.

At least in terms of food availability, today we live in a world that is capable of feeding every person that lives on the planet. On the occasion of the World Food Summit in 1996, the FAO estimated that world food production in that year was enough to provide at least 2,700 calories per person per day.[10] This is the result of centuries of innovation in food supply, thanks no doubt to great innovations in agricultural science, but attributable also to more mundane factors such as the adoption of the potato into the diet after the Spanish discovered it in Peru in the sixteenth century and imported it to Europe. One study

finds that potatoes may have been responsible for 12 percent of the global increase in population between 1700 and 1900.[11]

Starvation exists in today's world, but only as a result of the way the food gets shared among us. There is no absolute scarcity. It is true that if I eat a lot more than I need or, more plausibly, turn more of the corn into biofuels so that I can heat my pool, then there will be less for everybody else.[12] But, despite this, it seems that most people, even most very poor people, earn enough money to be able to afford an adequate diet, simply because calories tend to be quite cheap, except in extreme situations. Using price data from the Philippines, we calculated the cost of the cheapest diet sufficient to give 2,400 calories, including 10 percent calories from protein and 15 percent calories from fat. It would cost only 21 cents at PPP, very affordable even for someone living on 99 cents a day. The catch is, it would involve eating only bananas and eggs. . . . But it seems that so long as people are prepared to eat bananas and eggs when they need to, we should find very few people stuck on the left part of the S-shaped curve, where they cannot earn enough to be functional.

This is consistent with evidence from Indian surveys in which people were asked whether they had enough to eat (i.e., whether "everyone in the household got two square meals a day" or whether everyone eats "enough food every day"). The percentage of people who consider that they do not have enough food has dropped dramatically over time: from 17 percent in 1983 to 2 percent in 2004. So, perhaps people eat less because they are less hungry.

And perhaps they are really less hungry, despite eating fewer calories. It could be that because of improvements in water and sanitation, they are leaking fewer calories in bouts of diarrhea and other ailments. Or maybe they are less hungry because of the decline of heavy physical work—with the availability of drinking water in the village, women do not need to carry heavy loads for long distances; improvements in transportation have reduced the need to travel on foot; in even the poorest village, flour is now milled by the village miller using a motorized mill, instead of women grinding it by hand. Using the average calorie requirements calculated by the Indian Council of Medical Research for people engaged in heavy, moderate, or light activity, Deaton

and Dreze note that the decline in calorie consumption over the last quarter century could be entirely explained by a modest decrease in the number of people engaged in physically heavy work for a large part of the day.

If most people are at the point where they are not starving, it is possible that the productivity gains from consuming more calories are relatively modest for them. It would then be understandable if people chose to do something else with their money, or move away from eggs and bananas toward a more exciting diet. Many years ago, John Strauss was looking for a clear case to demonstrate the role of calories in productivity. He settled on self-employed farmers in Sierra Leone, because they really have to work hard.[13] He found that the productivity of a worker on a farm increased at most by 4 percent when his calorie intake increased by 10 percent. Thus, even if people doubled their food consumption, their income would only increase by 40 percent. Furthermore, the shape of the relationship between calories and productivity was not an S-shape, but an inverted L-shape, as in Figure 2 in the previous chapter: The largest gains are obtained at low levels of food consumption. There is no steep jump in income once people start eating enough. This suggests that the very poor benefit more from eating extra calories than the less poor. This is precisely the type of situation where we would not see a poverty trap. So it is not because they don't eat enough that most people stay poor.

This is not to say that the logic of the hunger-based poverty trap is flawed. The idea that better nutrition would propel someone on the path to prosperity was almost surely very important at some point in history, and it may still be important in some circumstances today. The Nobel Prize Laureate and economic historian Robert Fogel calculated that in Europe during the Renaissance and the Middle Ages, food production did not provide enough calories to sustain a full working population. This could explain why there were large numbers of beggars—they were literally incapable of any work.[14] The pressure of just getting enough food to survive seems to have driven some people to take rather extreme steps: There was an epidemic of "witch" killing in Europe during the "little ice age" (from the mid-sixteenth century to 1800), when crop failures were common and fish was less abundant.

Witches were most likely to be single women, particularly widows. The logic of the S-shape suggests that when resources are tight, it makes "economic sense" to sacrifice some people, so that the rest have enough food to be able to work and earn enough to survive.[15]

Evidence that poor families might occasionally be forced to make such horrific choices is not hard to find even in more recent times. During droughts in India in the 1960s, little girls in landless households were much more likely to die than boys, but boys' and girls' death rates were not very different when there was normal rainfall.[16] Reminiscent of the witch hunt of the little ice age, Tanzania experiences a rash of "witch" killings whenever there is a drought—a convenient way to get rid of an unproductive mouth to feed at times where resources are very tight.[17] Families, it seems, suddenly discover that an older woman living with them (usually a grandmother) is a witch, after which she gets chased away or killed by others in the village.

So it is not that the lack of food could not be a problem or isn't a problem from time to time, but the world we live in today is for the most part too rich for hunger to be a big part of the story of the persistence of poverty. This is of course different during natural or man-made disasters, or in famines that kill and weaken millions. As Amartya Sen has shown, however, most recent famines have been caused not by lack of food availability but by institutional failures that led to poor distribution of the available food, or even hoarding and storage in the face of starvation elsewhere.[18]

Should we let it rest here, then? Can we assume that the poor, though they may be eating little, do eat as much as they need to?

ARE THE POOR REALLY EATING WELL, AND EATING ENOUGH?

It is hard to avoid the feeling that the story does not add up. Can it be true that the poorest individuals in India are cutting back on food because they don't need the calories, given that they live in families that consume around 1,400 calories per capita per day to start with? After all, 1,200 calories is the famous semi-starvation diet, recommended for those who want rapid weight loss; 1,400 does not seem too far from

there. According to the Centers for Disease Control, the average American male consumed 2,475 calories per day in 2000.[19]

It is true that the poorest in India are also smaller, and if one is small enough, one doesn't need as many calories. But doesn't that just push the question back one level? Why are the poorest in India so small? Indeed, why are all South Asians so scrawny? The standard way to measure nourishment status is by the Body Mass Index (BMI), which is essentially a way to scale weight by height (i.e., adjusting for the fact that taller people are going to be heavier). The international cutoff for being malnourished is a BMI of 18.5, with 18.5 to 25 being the normal range, and people beyond 25 considered obese. By this measure, 33 percent of men and 36 percent of women in India were undernourished in 2004–2005, down from 49 percent for both in 1989. Among the eighty-three countries that have demographic and health survey data, only Eritrea has more undernourished adult women.[20] Indian women, along with Nepalese and Bangladeshi women, are also among the shortest in the world.[21]

Is this something to be concerned about? Could this be something purely genetic about South Asians, like dark eyes or black hair, but irrelevant for their success in the world? After all, even the children of South Asian immigrants in the United Kingdom or the United States are smaller than Caucasian or black children. It turns out, however, that two generations of living in the West without intermarriage with other communities is enough to make the grandchildren of South Asian immigrants more or less the same height as other ethnicities. So although genetic makeup is certainly important at the individual level, the genetic differences in height between populations are believed to be minimal. If the children of first-generation mothers are still small, it is partly because women who were themselves malnourished in childhood tend to have smaller children.

Therefore, if South Asians are small, it is probably because they, and their parents, did not get as much nourishment as their counterparts in other countries. And indeed, everything suggests that children are very badly nourished in India. The usual measure of how well a child has been fed through the childhood years is height, compared to the international average height for that age. By this measure, the numbers for

India from the National Family Health Survey (NFHS 3) are devastating. Roughly half the children under five are stunted, which means that they are far below the norm. One-fourth of them are severely stunted, representing extreme nutritional deprivation. The children are also extraordinarily underweight *given their height:* About one in five children under three is wasted, which means they fall below the international definition of severe malnourishment. What makes these facts more striking is that the stunting and wasting rates in sub-Saharan Africa, undoubtedly the poorest area of the world, are only about half those in India.

But once again, should we care? Is being small a problem, in and of itself? Well, there are the Olympic Games. India, a country with a billion inhabitants, has won an average of 0.92 medals per Olympics, over the course of twenty-two Olympic Games, putting it just below Trinidad and Tobago, at 0.93. To put these numbers in perspective, China has won 386 medals in eight games, at an average of 48.3, and there are seventy-nine countries that average better than India. Yet India has ten times as many people as all but six of those countries.

Of course India is poor, but not as poor as it used to be, and not nearly as poor as Cameroon, Ethiopia, Ghana, Haiti, Kenya, Mozambique, Nigeria, Tanzania, and Uganda, each of which, per head, has more than ten times India's medal count. Indeed, no country that has fewer medals per Olympics than India is even one-tenth of its size, with two notable exceptions—Pakistan and Bangladesh. Bangladesh, in particular, is the only country of over 100 million people that has never won an Olympic medal. The next largest such country is Nepal.

There is clearly a pattern. One could perhaps blame the South Asian obsession with cricket—that colonial cousin of baseball that baffles most Americans—but if cricket is absorbing all the sporting talent of one-fourth of the world's population, the results are really not that impressive. South Asians have never had the dominance over cricket that Australia, England, and even the tiny West Indies had in their heydays, despite their intense fealty to the sport and their massive size advantage—Bangladesh, for example, is bigger than England, South Africa, Australia, New Zealand, and the West Indies put together. Given that child malnutrition is one other area where South Asia really stands out,

it seems plausible that these two facts—wasted children and Olympian failure—have something to do with each other.

The Olympics are not the only place where height plays a role. In poor countries and rich countries alike, taller people do earn more. It has long been debated whether this is because height really matters for productivity—it could be discrimination against shorter people, for example. But a recent paper by Anne Case and Chris Paxson made some progress in nailing down what explains this relationship. They show that in the United Kingdom and the United States, the effect of height is entirely accounted for by differences in IQ: When we compare people who have the same IQ, there is no relationship between height and earning.[22] They interpret their findings as showing that what matters is good nutrition in early childhood: On average, adults who have been well nourished as children are both taller and smarter. And it is because they are smarter that they earn more. Of course, there are many not-so-tall people who are very bright (because they have reached the height they were meant to reach), but overall, tall people do better in life, because they are visibly more likely to have reached their genetic potential (both in height and in intelligence).

The study, when reported by Reuters under the not-so-subtle headline "Taller People Are Smarter—Study," created a firestorm. Case and Paxson were deluged by hostile e-mails. "Shame on you!" scolded one man (4 feet 9 inches). "I find your hypothesis insulting, prejudicial, inflammatory and bigoted," said another (5 feet 6 inches). "You have loaded a gun and pointed it at the vertically challenged man's head" (no height given).[23]

But in fact, there is a lot of evidence for the general view that childhood malnutrition directly affects the ability of adults to function successfully in the world. In Kenya, children who were given deworming pills in school for two years went to school longer and earned, as young adults, 20 percent more than children in comparable schools who received deworming for just one year: Worms contribute to anemia and general malnutrition, essentially because they compete with the child for nutrients.[24] A review study by some of the best experts on nutrition leaves little doubt that proper nutrition in childhood has far-reaching implications. They conclude: "Undernourished children are

more likely to become short adults, to have lower educational achievement, and to give birth to smaller infants. Undernutrition is also associated with lower economic status in adulthood."[25]

The impact of undernutrition on future life chances starts before birth. In 1995, the *British Medical Journal* coined the term "Barker Hypothesis" to refer to Dr. David Barker's theory that conditions in utero have long-term impact on a child's life chances.[26] There is considerable support for the Barker Hypothesis: To cite just one example, in Tanzania, children who were born to mothers who received sufficient amounts of iodine during pregnancy (because of an intermittent government program of distributing iodine capsules to would-be mothers) completed between one-third and one-half year more schooling, compared to their younger and older siblings who were in utero when the mother was not getting these capsules.[27] Although half a year of education might seem a small gain, it is a substantial increase, given that most of these children will complete only four or five years of schooling. In fact, based on their estimates, the study concludes that if every mother were to take iodine capsules, there would be a 7.5 percent increase in the total educational attainment of children in Central and Southern Africa. This, in turn, could affect the child's productivity throughout his or her life.

Although we saw that the impact of just increasing calories on productivity may not be very large per se, there are some ways to improve nutrition even for adults that will much more than pay for themselves. The one that we know most about is iron to treat anemia. In many Asian countries, including India and Indonesia, anemia is a major health problem. Six percent of men and 38 percent of women in Indonesia are anemic. The corresponding numbers in India are 24 percent and 56 percent. Anemia is associated with low aerobic capacity, general weakness and lethargy, and in some cases (especially for pregnant women) it can be life-threatening.

The Work and Iron Status Evaluation (WISE) study in Indonesia provided randomly chosen men and women in rural Indonesia with regular iron supplementation for several months, while the comparison group received a placebo.[28] The study found that the iron supplements made the men able to work harder, and the resulting increase in their

income was many times the cost of a yearly supply of iron-fortified fish sauce. A year's supply of the fish sauce cost $7 USD PPP, and for a self-employed male, the yearly gain in earnings was $46 USD PPP—an excellent investment.

The puzzle is that people do not seem to want more food, and yet more food and especially more judiciously purchased food would probably make them, and almost certainly their children, significantly more successful in life. The key investments that would achieve this are not expensive. Most mothers could surely afford iodized salt, which is now standard in many parts of the world, or one dose of iodine every two years (at 51 cents per dose). In Kenya, when International Child Support, the NGO that was running the deworming program, asked the parents in some schools to pay a few cents for deworming their children, almost all of them refused, which deprived their children of hundreds of dollars of extra earning over their lifetime.[29] As for food, households could easily get a lot more calories and other nutrients by spending less on expensive grains (like rice and wheat), sugar, and processed foods, and more on leafy vegetables and coarse grains.

WHY DO THE POOR EAT SO LITTLE?

Who Knew?

Why did anemic Indonesian workers not buy iron-fortified fish sauce on their own? One answer is that it is not clear that the additional productivity translates into higher earnings if employers do not know that a well-nourished worker is more productive. Employers may not realize that their employees are more productive now because they have eaten more, or better. The Indonesian study found a significant increase in earnings *only* among self-employed workers. If the employers pay everyone the same flat wage, there would be no reason to eat more to get stronger. In the Philippines, a study found that workers who worked both for a piece rate and for a flat wage ate 25 percent more food on days they worked for piece rate (where effort mattered, since the more they worked, the more they got paid).

This does not explain why all pregnant women in India aren't using only iodine-fortified salt, which is now available for purchase in every

village. A possibility is that people may not realize the value of feeding themselves and their children better. The importance of micronutrients was not fully understood, even by scientists, until relatively recently. Although micronutrients are cheap and can sometimes lead to a large increase in lifetime income, it is necessary to know exactly what to eat (or what pills to take). Not everyone has the information, even in the United States.

Moreover, people tend to be suspicious of outsiders who tell them that they should change their diet, probably because they like what they eat. When rice prices went up sharply in 1966–1967, the chief minister of West Bengal suggested that eating less rice and more vegetables would be both good for people's health and easier on their budget. This set off a flurry of protests, and the chief minister was greeted by protesters with garlands of vegetables wherever he went. Yet he was probably right. Understanding the importance of popular support, Antoine Parmentier, an eighteenth-century French pharmacist who was an early fan of the potato, clearly anticipating resistance, offered the public a set of recipes he had invented using potatoes, including the classic dish Hachis Parmentier (essentially what the British call shepherd's pie, a layered casserole composed of ground meat with a covering of mashed potatoes). He thereby set off a trajectory that ultimately led, through many twists and turns, to the invention of "freedom fries."

Also, it is not very easy to learn about the value of many of these nutrients based on personal experience. Iodine might make your children smarter, but the difference is not huge (though a number of small differences may add up to something big) and in most cases you will not find out either way for many years. Iron, even if it makes people stronger, does not suddenly turn you into a superhero: The $40 extra a year the self-employed man earned may not even have been apparent to him, given the many ups and downs of his weekly income.

Consequently, it is no surprise that the poor choose their foods not mainly for their cheap prices and nutritional values, but for how good they taste. George Orwell, in his masterful description of the life of poor British workers in *The Road to Wigan Pier*, observes:

> The basis of their diet, therefore, is white bread and Margarine, corned beef, sugared tea, and potato—an appalling diet. Would it not be better if they spent more money on wholesome things like oranges and wholemeal bread, or if they even, like the reader of the *New Statesman,* saved on fuel and ate their carrots raw? Yes it would, but the point is, no human being would ever do such a thing. The ordinary human being would sooner starve than live on brown bread and raw carrots. And the peculiar evil is this, that the less money you have the less you are inclined to spend it on wholesome food. A millionaire may enjoy breakfasting off orange juice and Ryvita biscuits; an unemployed man does not. . . . When you are unemployed, you don't *want* to eat dull wholesome food. You want to eat something a little *tasty*. There is always some cheap pleasant thing to tempt you.[30]

More Important Than Food

The poor often resist the wonderful plans we think up for them because they do not share our faith that those plans work, or work as well as we claim. This is one of the running themes in this book. Another explanation for their eating habits is that other things are more important in the lives of the poor than food.

It has been widely documented that poor people in the developing world spend large amounts on weddings, dowries, and christenings, probably in part as a result of the compulsion not to lose face. The cost of weddings in India is well-known, but there are also less cheerful occasions when the family is compelled to throw a lavish party. In South Africa, social norms on how much to spend on funerals were set at a time when most deaths occurred in old age or in infancy.[31] Tradition called for infants to be buried very simply but for elders to have elaborate funerals, paid for with money the deceased had accumulated over a lifetime. As a result of the HIV/AIDS epidemic, many prime-age adults started dying without having accumulated burial savings, but their families felt compelled to honor the norm for adults. A family that had just lost one of its main potential earners might have to spend something like 3,400 rand (around $825 USD PPP), or 40 percent of

the household annual per capita income, for the funeral party. After such a funeral, the family clearly has less to spend, and more family members tend to complain about "lack of food," even when the deceased was not earning before he died, which suggests that funeral costs are responsible. The more expensive the funeral, the more depressed the adults are one year later, and the more likely it is that children have dropped out of school.

Not surprisingly, both the king of Swaziland and the South African Council of Churches (SACC) have tried to regulate funeral expenditures. In 2002, the king simply banned lavish funerals[32] and announced that if a family was found to have slaughtered a cow for their funeral, they would have to give one cow to the chief's herd. The SACC, rather more soberly, called for a regulation of the funeral industry, which, they felt, was putting pressure on families to spend more than they could afford.

The decision to spend money on things other than food may not be due entirely to social pressure. We asked Oucha Mbarbk, a man we met in a remote village in Morocco, what he would do if he had more money. He said he would buy more food. Then we asked him what he would do if he had even more money. He said he would buy better-tasting food. We were starting to feel very bad for him and his family, when we noticed a television, a parabolic antenna, and a DVD player in the room where we were sitting. We asked him why he had bought all these things if he felt the family did not have enough to eat. He laughed, and said, "Oh, but television is more important than food!"

After spending some time in that Moroccan village, it was easy to see why he thought that. Life can be quite boring in a village. There is no movie theater, no concert hall, no place to sit and watch interesting strangers go by. And not a lot of work, either. Oucha and two of his neighbors, who were with him during the interview, had worked about seventy days in agriculture and about thirty days in construction that year. For the rest of the year, they took care of their cattle and waited for jobs to materialize. This left plenty of time to watch television. These three men all lived in small houses without water or sanitation. They struggled to find work, and to give their children a good

education. But they all had a television, a parabolic antenna, a DVD player, and a cell phone.

Generally, it is clear that things that make life less boring are a priority for the poor. This may be a television, or a little bit of something special to eat—or just a cup of sugary tea. Even Pak Solhin had a television, although it was not working when we visited him. Festivals may be seen in this light as well. Where televisions or radios are not available, it is easy to see why the poor often seek out the distraction of a special family celebration of some kind, a religious observance, or a daughter's wedding. In our eighteen-country data set, it is clear that the poor spend more on festivals when they are less likely to have a radio or a television. In Udaipur, India, where almost no one has a television, the extremely poor spend 14 percent of their budget on festivals (which includes both lay and religious occasions). By contrast, in Nicaragua, where 58 percent of rural poor households have a radio and 11 percent own a television, very few households report spending anything on festivals.[33]

The basic human need for a pleasant life might explain why food spending has been declining in India. Today, television signals reach into remote areas, and there are more things to buy, even in remote villages. Cell phones work almost everywhere, and talk time is extremely cheap by global standards. This would also explain why countries with a large domestic economy, where a lot of consumer goods are available cheaply, like India and Mexico, tend to be the countries where food spending is the lowest. Every village in India has at least one small shop, usually more, with shampoo sold in individual sachets, cigarettes by the stick, very cheap combs, pens, toys, or candies, whereas in a country like Papua New Guinea, where the share of food in the household budget is above 70 percent (it is 50 percent in India), there may be fewer things available to the poor. Orwell captured this phenomenon as well in *The Road to Wigan Pier* when he described how poor families managed to survive the depression.

> Instead of raging against their destiny, they have made things tolerable by reducing their standards. But they don't necessarily reduce their

> standards by cutting out luxuries and concentrating on necessities; more often it is the other way around—the more natural way, if you come to think of it—hence the fact that in a decade of unparalleled depression, the consumption of all cheap luxuries has increased.[34]

These "indulgences" are not the impulsive purchases of people who are not thinking hard about what they are doing. They are carefully thought out, and reflect strong compulsions, whether internally driven or externally imposed. Oucha Mbarbk did not buy his TV on credit—he saved up over many months to scrape enough money together, just as the mother in India starts saving for her eight-year-old daughter's wedding some ten years or more into the future, by buying a small piece of jewelry here and a stainless steel bucket there.

We are often inclined to see the world of the poor as a land of missed opportunities and to wonder why they don't put these purchases on hold and invest in what would really make their lives better. The poor, on the other hand, may well be more skeptical about supposed opportunities and the possibility of any radical change in their lives. They often behave as if they think that any change that is significant enough to be worth sacrificing for will simply take too long. This could explain why they focus on the here and now, on living their lives as pleasantly as possible, celebrating when occasion demands it.

SO IS THERE REALLY A NUTRITION-BASED POVERTY TRAP?

We opened this chapter with Pak Solhin, and his view that he was caught in a nutrition-based poverty trap. At the most literal level, the main problem in his case was probably not a lack of calories. The Rakshin Program was providing him with some free rice, and between that and the help his brother was giving him, he would probably have been physically able to work in the field or on a construction site. Our reading of the evidence suggests that most adults, even the very poor, are outside of the nutrition poverty trap zone: They can easily eat as much as they need to be physically productive.

This was probably the case with Pak Solhin. This not to say that he was not trapped. But his problem may have come from the fact that his job had vanished, and he was too old to be taken as an apprentice on a construction site. His situation was almost surely made worse by the fact that he was depressed, which made it difficult for him to do anything at all.

The fact that the basic mechanics of a nutrition-based poverty trap do not seem to be at work for adults does not mean that nutrition is not a problem for the poor. But the problem may be less the quantity of food than its quality, and in particular the shortage of micronutrients. The benefits of good nutrition may be particularly strong for two sets of people who do not decide what they eat: unborn babies and young children. In fact, there may well be an S-shaped relationship between their parent's income and the eventual income of these children, caused by childhood nutrition. That is because a child who got the proper nutrients in utero or during early childhood will earn more money *every year of his or her life:* This adds up to large benefits over a lifetime. For example, the study of the long-term effect of deworming children in Kenya, mentioned above, concluded that being dewormed for two years instead of one (and hence being better nourished for two years instead of one) would lead to a lifetime income gain of $3,269 USD PPP. Small differences in investments in childhood nutrition (in Kenya, deworming costs $1.36 USD PPP per year; in India, a packet of iodized salt sells for $0.62 USD PPP; in Indonesia, fortified fish sauce costs $7 USD PPP per year) make a huge difference later on. This suggests that governments and international institutions need to completely rethink food policy. Although this may be bad news for American farmers, the solution is not to simply supply more food grains, which is what most food security programs are currently designed to do. The poor like subsidized grains, but as we discussed earlier, giving them more does little to persuade them to eat better, especially since the main problem is not calories, but other nutrients. It also is probably not enough just to provide the poor with more money, and even rising incomes will probably not lead to better nutrition in the short run. As we saw in India, the poor do not eat any more or any better when their income goes up; there are too many other pressures and desires competing with food.

In contrast, the social returns of directly investing in children and pregnant mother nutrition are tremendous. This can be done by giving away fortified foods to pregnant mothers and parents of small children, by treating children for worms in preschool or at school, by providing them with meals rich in micronutrients, or even by giving parents incentives to consume nutritional supplements. All of this is already being done in some countries. The government of Kenya is now systematically deworming children in school. In Colombia, micronutrient packets are sprinkled on kids' meals in preschool. In Mexico, social welfare payments come with free nutritional supplements for the family. Developing ways to pack *foods that people like to eat* with additional nutrients, and coming up with new strains of nutritious and tasty crops that can be grown in a wider range of environments, need to become priorities for food technology, on an equal footing with raising productivity. We do see some instances of this across the world, pushed by organizations such as the Micronutrient Initiative and HarvestPlus: A variety of orange sweet potatoes (richer in beta carotene than the native yam) suitable for Africa was recently introduced in Uganda and Mozambique.[35] A new salt, fortified both with iron and iodine, is now approved for use in several countries, including India. But there are all too many instances where food policy remains hung up on the idea that all the poor need is cheap grain.

3

Low-Hanging Fruit for Better (Global) Health?

Health is an area of great promise but also great frustration. There seems to be plenty of "low-hanging fruit" available, from vaccines to bed nets, that could save lives at a minimal cost, but all too few people make use of such preventive technologies. Government health workers, who are in charge of delivering basic health-care services in most countries, are often blamed for this failure, not entirely unfairly, as we will see. They, on the other hand, insist that plucking these low-hanging fruits is much harder than it seems.

In winter 2005 in the beautiful town of Udaipur in western India, we had an animated discussion with a group of government nurses. They were very upset with us because we were involved in a project that aimed to get them to come to work more often. At some point in the proceedings, one of them got so exasperated that she decided to be blunt: The job was essentially pointless anyway, she announced. When a child came to them with diarrhea, all they could offer the mother was a packet of oral rehydration solution (or ORS, a mixture of salt, sugar, potassium chloride, and an antacid to be mixed with water and drunk by the child). But most mothers didn't believe that ORS could do any good. They wanted what they thought was the right treatment—an

antibiotic or an intravenous drip. Once a mother was sent away from the health center with just a packet of ORS, the nurses told us, she never came back. Every year, they saw scores of children die from diarrhea, but they felt utterly powerless.

Of the 9 million children who die before their fifth birthdays each year, the vast majority are poor children from South Asia and sub-Saharan Africa, and roughly one in five dies of diarrhea. Efforts are under way to develop and distribute a vaccine against rotavirus, the virus responsible for many (though not all) of the cases of diarrhea. But three "miracle drugs" could already save most of these children: chlorine bleach, for purifying water; and salt and sugar, the key ingredients of the rehydration solution ORS. A mere $100 spent on chlorine packaged for household use can prevent thirty-two cases of diarrhea.[1] Dehydration is the main proxy cause of death from diarrhea, and ORS, which is close to being free, is a wonderfully effective way to prevent it.

Yet neither chlorine nor ORS is used very much. In Zambia, thanks to the efforts of Population Service International (PSI), a large organization that markets it at subsidized prices worldwide, chlorine is cheap and widely available. At the cost of 800 kwachas ($0.18 USD PPP), a family of six can buy enough bleach to purify its water supply, avoiding waterborne diarrhea. But only 10 percent of families use it.[2] In India, according to the United Nations Children's Fund (UNICEF), only one-third of children under five who had diarrhea were given ORS.[3] Why are some 1.5 million children dying every year of diarrhea, a disease that could often be avoided in the first place, and could often be treated with boiled water, sugar, and salt?

Bleach and ORS are not unique examples. There is other relatively "low-hanging fruit" with promise to improve health and save many lives. These are cheap and simple technologies that, if properly utilized, would save much in resources (in terms of extra days worked, less antibiotics used, stronger bodies, and so on). They could pay for themselves, in addition to saving lives. But too many of these fruits are left unpicked. It is not that people don't care about their health. They do, and they devote considerable resources to it. They just seem to spend

money elsewhere: on antibiotics that are not always necessary, on surgery that comes too late to help. Why does it have to be this way?

THE HEALTH TRAP

In a village in Indonesia we met Ibu Emptat, the wife of a basket weaver. A few years before our first meeting (in summer 2008), her husband was having trouble with his vision and could no longer work. She had no choice but to borrow money from the local moneylender—100,000 rupiah ($18.75 USD PPP) to pay for medicine so that her husband could work again, and 300,000 rupiah ($56 USD PPP) for food for the period when her husband was recovering and could not work (three of her seven children were still living with them). They had to pay 10 percent per month in interest on the loan. However, they fell behind on their interest payments and by the time we met, her debt had ballooned to 1 million rupiah ($187 USD PPP); the moneylender was threatening to take everything they had. To make matters worse, one of her younger sons had recently been diagnosed with severe asthma. Because the family was already mired in debt, she couldn't afford the medicine needed to treat his condition. He sat with us throughout our visit, coughing every few minutes; he was no longer able to attend school regularly. The family seemed to be caught in a classic poverty trap—the father's illness made them poor, which is why the child stayed sick, and because he was too sick to get a proper education, poverty loomed in his future.

Health certainly has the potential to be a source of a number of different traps. For example, workers living in an insalubrious environment may miss many workdays; children may be sick often and unable to do well in school; mothers who give birth there may have sickly babies. Each of these channels is potentially a mechanism for current misfortunes to turn into future poverty.

The good news is that if something like this is what is going on, we may only need one push, one generation that gets to grow up and work in a healthy environment, to set the trap loose. This is Jeffrey Sachs's view, for example. As he sees it, a large proportion of the world's

poorest people, and indeed entire countries, are stuck in a health-based poverty trap. Malaria is his favorite example: Countries in which a large fraction of the population is exposed to malaria are much poorer (on average, countries like Côte d'Ivoire or Zambia, where 50 percent or more of the population is exposed to malaria, have per capita incomes that are one-third of those in the countries where no one today gets malaria).[4] And being so much poorer makes it harder for them to take steps to prevent malaria, which in turns keeps them poor. But this also means, according to Sachs, that public health investments aimed at controlling malaria (such as the distribution of bed nets to keep the mosquitoes at bay during the night) in these countries could have very high returns: People would be sick less often and able to work harder, and the resulting income gains would easily cover the costs of these interventions and more. To put it in terms of the S-shaped curve in Chapter 1, African countries where malaria is endemic are stuck in the left part of the curve, where their malaria-weakened labor force is too unproductive and hence too poor to be able to pay for malaria eradication. But if someone did them the favor of financing malaria eradication, they would end up on the right part of the curve, on the road to prosperity. The same argument could be made about other diseases that are prevalent in poor countries. This is the core of the optimistic message of Sachs's book *The End of Poverty.*

Skeptics have been quick to point out that it is not clear whether malaria-infested countries are poor because of malaria, as Sachs assumes, or perhaps their inability to eradicate malaria is an indicator of the fact that they are poorly governed. If it is the latter, then the mere eradication of malaria may achieve very little, as long as governance remains weak.

Whose story—the activists' or the skeptics'—does the evidence support? Successful campaigns to eradicate malaria have been studied in a number of different countries. Each of these studies compares high-malaria-prevalence regions in the country with low-prevalence regions and checks what happens to children born in these areas before and after the campaign. They all find that life outcomes (such as education or earnings) of children born after the campaign in areas where malaria was once prevalent catch up with those of children born in low-

incidence areas. This strongly suggests that eradicating malaria indeed results in a reduction in long-term poverty, although the effects are not nearly as large as those suggested by Jeffrey Sachs: One study on malaria eradication in the U.S. South (which had malaria until 1951)[5] and several countries in Latin America[6] suggests that *a child who grew up malaria-free earns 50 percent more per year, for his entire adult life*, compared to a child who got the disease. Qualitatively similar results were found in India,[7] Paraguay, and Sri Lanka, although the magnitude of the gain varies from country to country.[8]

This result suggests that the financial return to investing in malaria prevention can be fantastically high. A long-lasting insecticide-treated bed net costs at most $14 USD PPP in Kenya, and lasts about five years. Assume conservatively that a child in Kenya sleeping under a treated net has 30 percent less risk of being infected with malaria between birth and age two, compared to a child who doesn't. In Kenya, an adult makes on average $590 USD PPP a year. Thus, if malaria indeed reduces earnings in Kenya by 50 percent, a $14 investment will increase incomes by $295 for the 30 percent of the population that would have gotten malaria without the net. The average return is $88 every year over the child's entire adult work life—enough for a parent to buy a lifetime supply of bed nets for all his or her children, with a chunk of change left over.

There are other examples of highly effective health investments. Access to clean water and sanitation is one of them. Overall, in 2008, according to estimates by WHO and UNICEF, approximately 13 percent of the world's population lacked access to improved water sources (typically meaning a tap or a well) and about one-fourth did not have access to water that is safe to drink.[9] And many of these people are the very poor. In our eighteen-country data set, access to tap water at home among the rural extremely poor varied from less than 1 percent (in rural Rajasthan and Uttar Pradesh in India) to 36.4 percent (in Guatemala). The numbers tend to be much better for richer households, though they vary a lot from country to country (from less than 3.2 percent in Papua New Guinea to 80 percent in Brazil, for the rural middle class). They are higher in urban areas, both for the poor and the

middle class. Decent sanitation facilities are even rarer among the poor—42 percent of the world's population lives without a toilet at home.

Most experts agree that access to piped water and sanitation can have a dramatic impact on health. A study concluded that the introduction of piped water, better sanitation, and chlorination of water sources was responsible for something like three-fourths of the decline in infant mortality between 1900 and 1946 and nearly half the overall reduction in mortality over the same period.[10] Moreover, repeated bouts of diarrhea during childhood permanently impair both physical and cognitive development. It is estimated that by piping uncontaminated, chlorinated water to households, it is possible to reduce diarrhea by up to 95 percent.[11] Poor water quality and pools of stagnant water are also a cause of other major illnesses, including malaria, schistosomiasis, and trachoma,[12] any of which can kill children or make them less productive adults.

Nevertheless, the conventional wisdom is that today, at $20 per household per month, providing piped water and sanitation is too expensive for the budget of most developing countries.[13] The experience of Gram Vikas, an NGO that works in Orissa, India, shows, however, that it is possible to do it much more cheaply. Its CEO, Joe Madiath, a man with a self-deprecating sense of humor who attends the annual meeting of the world's rich and powerful at the World Economic Forum in Davos, Switzerland, in outfits made from homespun cotton, is used to doing things differently. Madiath's career as an activist started early: He was twelve when he first got into trouble—for organizing the labor on the plantation that his father owned. He came to Orissa in the early 1970s with a group of left-wing students to help out after a devastating cyclone. After the immediate relief work was over, he decided to stay and see if he could find some more permanent ways to help the poor Oriya villagers. He eventually settled on water and sanitation. What attracted him to the issue was that it was simultaneously a daily challenge and an opportunity to initiate long-term social change. He explained to us that in Orissa, water and sanitation are social issues. Madiath insists that every single household in the villages where Gram Vikas operates should be connected to the same water mains: Water is piped to each

house, which contains a toilet, a tap, and a bathing room, all connected to the same system. For the high-caste households, this means sharing water with low-caste households, which, for many in Orissa, was unacceptable when first proposed. It takes the NGO a while to get the agreement of the whole village and some villages eventually refuse, but it has always stuck to the principle that it would not start its work in a village until everyone there agreed to participate. When agreement is finally reached, it is often the first time that some of the upper-caste households participate in a project that involves the rest of the community.

Once a village agrees to work with Gram Vikas, the building work starts and continues for one to two years. Only after every single house has received its tap and toilet is the system turned on. In the meantime, Gram Vikas collects data every month on who has gone to the health center to get treated for malaria or diarrhea. We can thus directly observe what happens in a village as soon as the water starts flowing. The effects are remarkable: Almost overnight, and for years into the future, the number of severe diarrhea cases falls by one-half, and the number of malaria cases falls by one-third. The monthly cost of the system for each household, including maintenance, is 190 rupees, or $4 per household (in current USD), only 20 percent of what is conventionally assumed to be the cost of such a system.

There are even cheaper ways to avert diarrhea, such as adding chlorine to water. Other very inexpensive medical or public health technologies with proven effectiveness include ORS, getting children immunized, deworming drugs, exclusive breast-feeding until six months, and some routine antenatal procedures such as a tetanus shot for the expectant mother. Vitamin B against night blindness, iron pills and iron-fortified flour against anemia, and so on are other examples of low-hanging fruit.

The existence of these technologies is the source of both Jeffrey Sachs's optimism and his impatience. As he sees it, there are health-based poverty traps, but there are also ladders we can give to the poor to help them escape from these traps. If the poor cannot afford these ladders, the rest of the world should help them out. This is what Gram Vikas does in Orissa, by helping to organize the villages, and by subsidizing

the cost of the water systems. A few years ago, Joe Madiath told us he felt he had to turn down funding from the Bill & Melinda Gates Foundation when the grant officer insisted that the villagers should pay the full cost of what they were getting (fortunately, the foundation subsequently changed its view on this question). He argued that villagers simply cannot afford 190 rupees per month, even though it is true that the health benefits are potentially worth far more—Gram Vikas only asks villagers to pay enough money into a village fund to be able to keep the system in good repair and be able to add new households as the village grows. The rest the NGO raises from donors all over the world. In Sachs's view, this is how things should be.

WHY AREN'T THESE TECHNOLOGIES USED MORE?

Underutilized Miracles

There is one wrinkle with Sachs's theory that poor people are stuck in a health-based poverty trap and that money can get them out of it. Some of these technologies are so cheap that everyone, even the very poor, should be able to afford them. Breast-feeding, for example, costs nothing at all. And yet fewer than 40 percent of the world's infants are breast-fed exclusively for six months, as the WHO recommends.[14] Another good example is water: Piping water to homes (combined with sewerage) costs 190 rupees per month, or 2,280 rupees per year, as we saw, which in terms of purchasing power is equivalent to about 300,000 Zambian kwachas. It is likely that poor villagers in Zambia cannot afford that much. But for less than 2 percent of that, a Zambian family of six can buy enough chlorine bleach to purify their entire drinking water intake for the year: A bottle of Chlorin (a brand of chlorine distributed by PSI) costs 800 kwachas ($0.18 USD PPP) and lasts a month. This can reduce diarrhea in young children by up to 48 percent.[15] People in Zambia know about the benefits of chlorine. Indeed, when asked to name something that cleans drinking water, 98 percent mention Chlorin. Although Zambia is a very poor country, 800 kwachas for a bottle that lasts a month is really not a lot of money—the average family spends 4,800 kwachas ($1.10 USD PPP)

per week just on cooking oil. Yet only 10 percent of the population actually uses bleach to treat their water. When, as part of an experiment, some households were offered a discount voucher that would entitle them to a bottle of Chlorin for 700 kwachas ($0.16 USD PPP), only about 50 percent wanted to buy it.[16] This fraction went up sharply when the price was lowered to 300 kwachas ($0.07 USD PPP), but remarkably, even at this reduced price one-fourth of the people did not buy the product.

Demand is similarly low for bed nets. In Kenya, Jessica Cohen and Pascaline Dupas set up an NGO called TAMTAM (Together Against Malaria), to distribute free mosquito nets in prenatal clinics in Kenya.[17] At some point, PSI started distributing subsidized, but not free, nets in the same clinics. Cohen and Dupas wanted to find out whether their organization was still needed. They set up a simple test: They offered nets at various prices in different clinics, chosen at random. The price varied from free in some places to the (still subsidized) price charged by PSI in others. Much as in the case of Chlorin, they found that the purchase of nets was indeed very sensitive to the price. Almost everybody took a free net home. But the demand for nets fell to very close to zero at the PSI price (about $0.75 USD PPP). When Dupas replicated the experiment in different market towns but gave people the time to go home and collect cash (rather than having to buy on the spot), more people bought at the PSI price, but demand still went up by several times when the price was brought down toward zero.[18]

Even more troubling is the related fact that the demand for bed nets, though very sensitive to price, is not very sensitive to income. To get on the right part of the S-shaped curve and start a virtuous circle where improved health and increased income reinforce each other, the increase in income coming from one person avoiding malaria should be enough to make it very likely that his or her children buy a net and avoid malaria as well. We argued above that buying bed nets to reduce the risk of getting malaria has the potential to raise annual incomes by a substantial 15 percent on average. However, even though a 15 percent increase in income is far more than the cost of a bed net, people who are 15 percent richer are only 5 percent more likely to buy a net than others.[19] In other words,

far from virtually ensuring that the next generation sleeps under a net, distributing free bed nets once would only increase the number of children in the next generation sleeping under a net from 47 percent to 52 percent. That is not nearly enough to eradicate malaria.

What the lack of demand underscores is perhaps the fundamental difficulty of the problem of health: The ladders to get out of the poverty trap exist but are not always in the right place, and people do not seem to know how to step onto them or even want to do so.

The Desire for Better Health

Since they do not seem to be willing to sacrifice much money or time to get clean water, bed nets, or for that matter, deworming pills or fortified flour, despite their potentially large health benefits, does that mean the poor do not care about health? The evidence suggests the opposite. When asked whether there was a period of a month in the recent past when they felt "worried, tense, or anxious," roughly one-fourth of the poor in both rural Udaipur and urban South Africa said yes.[20] This is much higher than what we see in the United States. And the most frequent source of such stress (44 percent of the time in Udaipur) is their own health or that of their close relatives. In many of the countries in our eighteen-country data set, the poor spend a considerable amount of their own money on health care. The average extremely poor household spends up to 6 percent of its monthly budget on health in rural India, and 3 percent to 5 percent in Pakistan, Panama, and Nicaragua. In most countries, more than one-fourth of the households had made at least one visit to a health practitioner in the previous month. The poor also spend large amounts of money on single health events: Among the poor families in Udaipur, 8 percent of the households recorded total expenditures on health of more than 5,000 rupees ($228 USD PPP) in the previous month, ten times the monthly budget per capita for the average family, and some households (the top 1 percent spenders) spent up to twenty-six times the average monthly budget per capita. When faced with a serious health issue, poor households cut spending, sell assets, or borrow, like Ibu Emptat, often at very high rates: In Udaipur, every third household we inter-

viewed was currently repaying a loan taken out to pay for health care. A substantial proportion of those loans are from moneylenders, at rates that can be very high: The standard interest rate is 3 percent per month (42 percent per year).

Money for Nothing

The issue is therefore not how much the poor spend on health, but what the money is spent on, which is often expensive cures rather than cheap prevention. To make health care less expensive, many developing countries officially have a triage system to ensure that affordable (often free) basic curative services are available to the poor relatively close to their homes. The nearest center typically does not have a doctor, but the staff member there is trained to treat simple conditions and detect more serious ones, in which case the patient is sent up to the next level. There are countries where this system is under severe strain for lack of manpower, but in many countries, like India, the facilities do exist, and the positions are filled. Even in Udaipur District, which is particularly remote and sparsely populated, a family needs to walk only a mile and a half to find a subcenter staffed with a trained nurse. Yet we have collected data that suggest that this system is not working. The poor mostly shun the free public health-care system. The average adult we interviewed in an extremely poor household saw a health-care provider once every two months. Of these visits, less than one-fourth were to a public facility.[21] More than one-half were to private facilities. The remainder were to *bhopas*—traditional healers who primarily offer exorcism from evil spirits.

The poor in Udaipur seem to select the doubly expensive plan: cure, rather than prevention, and cure from private doctors rather than from the trained nurses and doctors the government provides for free. That might make sense if the private doctors were better qualified, but this does not seem to be the case: Just over half of the private "doctors" have a medical college degree (this includes unconventional degrees like BAMS [Bachelor of Ayurvedic Medical Science] and BUMS [Bachelor of Unani Medical Science]), and one-third have no college education whatsoever. When we look at the people who "help the

doctor," most of whom also see patients, the picture becomes even bleaker: Two-thirds have no formal qualification in medicine at all.[22]

In the local parlance, unqualified doctors like these are referred to as "Bengali doctors," because one of the earliest medical colleges in India was in Bengal and doctors from Bengal fanned across northern India looking for places to practice medicine. That tradition has continued—people continue to show up in a village with little more than a stethoscope and a bag of standard medications and set up as Bengali doctors, irrespective of whether they are from Bengal or not. We interviewed one who explained how he became a doctor: "I graduated from high school and couldn't find a job, which is when I decided to set up as a doctor." He very graciously showed us his high school diploma. His qualifications were in geography, psychology, and Sanskrit, the ancient Indian language. Bengali doctors are not only a rural phenomenon. In the slums of Delhi, a study found that only 34 percent of the "doctors" had a formal medical degree.[23]

Of course, not having a degree is not necessarily synonymous with being incompetent: These doctors could very well have learned to treat easy cases and to refer the rest to a real hospital. Another of the Bengali doctors we talked to (who really was from Bengal) was very clear that he knew his limits—he gave out paracetamols (like Tylenol) and antimalarials, perhaps some antibiotics when the disease looked like it might respond to it. If it looked like a difficult case, he referred patients to the Primary Health Center (PHC) or to a private hospital.

However, this kind of self-awareness is unfortunately not universal. In urban Delhi, Jishnu Das and Jeff Hammer, two World Bank economists, set out to find out what doctors actually know.[24] They started with a sample of doctors of all kinds (public and private, qualified and unqualified) and presented each of them with five health-related "vignettes." For example, a hypothetical child patient arrives with symptoms of diarrhea: The recommended medical practice is for the doctor to first ask enough questions to figure out whether the child has been running a high fever or vomiting, and if the answer is no, so that more serious conditions are ruled out, to prescribe ORS. Another vignette involves a pregnant woman arriving with the visible symptoms of preeclampsia, a potentially fatal condition that requires immediate referral to a hospital.

The doctors' answers and the questions they chose to ask were compared to the "ideal" questions and responses to form an index of each doctor's competence. The average competence in the sample was remarkably low. Even the very best doctors (the top twenty out of 100) asked fewer than half the questions they should have, and the worst (the bottom twenty) asked only one-sixth of those questions. Moreover, the large majority of these doctors would have recommended a course of action that, based on the assessment of an expert panel of doctors, was more likely to do harm than good. The unqualified private doctors were by far the worst, particularly those who worked in poor neighborhoods. The best were the qualified private doctors. The public doctors were somewhere in the middle.

There was also a clear pattern in the errors: Doctors tended to underdiagnose and overmedicate. In our health survey in Udaipur, we found that a patient was given a shot in 66 percent of the visits to a private facility and a drip in 12 percent of the visits. A test is performed in only 3 percent of the visits. The usual form of treatment for diarrhea, fever, or vomiting is to prescribe antibiotics or steroids, or both, usually injected.[25]

This is not only unnecessary in most cases, but potentially dangerous. First, there is the issue of sterilizing needles. Some friends of ours used to run a primary school in a small village on the outskirts of Delhi, where there was a doctor of unknown credentials but with a flourishing practice. Outside his dispensary was a huge drum that was always kept filled with water, with a little tap attached to it. After every patient left, the doctor would come outside and make a show of washing his needle with water from the drum. This was his way of signaling that he was being careful. We do not know whether he actually infected anyone with his syringe, but doctors in Udaipur talk about a particular doctor who infected an entire village with Hepatitis B by reusing the same unsterilized needle.

The misuse of antibiotics increases the likelihood of the emergence of drug-resistant strains of bacteria.[26] This is particularly true if, as many of these doctors are wont to do to save their patients money, the advised course is shorter than the standard regimen. Across the developing world, we are seeing a rise in antibiotic resistance. Similarly, incorrect

dosage and poor patient compliance explain the emergence, in several African countries, of strains of malaria parasites that are resistant to mainstream medications, which has the makings of a public health disaster.[27] In the case of steroids, the damage from overuse is even more insidious. Any researchers of age forty or older who have surveyed the poor in countries like India can recall an occasion when they were surprised to discover that someone they thought was much older than them was in fact significantly younger. Premature aging can result from many causes, but steroid use is definitely one of them—and it is not just that affected individuals look older, they also die sooner. Yet because the immediate effect of the medicine is to make the patient feel rapidly better and she is not told what might happen later, she goes home happy.

What is going on here? Why do the poor sometimes reject inexpensive effective sanitation—the cheap and easy way to dramatically improve people's health—in favor of spending a lot of money on things that don't help and might actually hurt?

Are Governments to Blame?

A part of the answer is that a lot of the cheap gains are in prevention, and prevention has traditionally been the area where the government is the main player. The trouble is that governments have a way of making easy things much less easy than they should be. The high absenteeism rates and low motivation among government health providers are certainly two reasons we don't see more preventive care being delivered.

Government health centers are often closed when they are supposed to be open. In India, the local health posts are supposed to be open six days a week, six hours a day. But in Udaipur, we visited over 100 facilities once a week at some random time during working hours for a year. We found them closed 56 percent of the time. And in only 12 percent of the cases was this because the nurse was on duty somewhere else near the center. The rest of the time, she was simply absent. This rate of absence is similar elsewhere. In 2002–2003, the World Bank conducted a World Absenteeism Survey in Bangladesh, Ecuador, India, Indonesia, Peru, and Uganda and found that the average absentee rate

of health workers (doctors and nurses) was 35 percent (it was 43 percent in India).[28] In Udaipur, we found that these absences are also unpredictable, which makes it even harder for the poor to rely on these facilities. Private facilities offer the assurance that the doctor will be there. If he isn't, he won't get paid, whereas the absent government employee on a salary will.

Furthermore, even when government doctors and nurses are around, they do not treat their patients particularly well. Working with the same group of doctors who had responded to the vignette questions, one member of Das and Hammer's research team sat with each provider for a whole day. For each patient, the researcher recorded details about the visit, including the number of questions the doctor asked concerning the history of the problem, the examinations performed, medicines prescribed or given, and (for the private sector) prices charged. The overall sense we get from their study about health care in India, both public and private, is frightening. Das and Hammer describe it as the 3-3-3 rule: The median interaction lasts *three minutes;* the provider asks *three questions* and occasionally performs some examinations. The patient is then provided with *three medicines* (providers usually dispense medicine directly rather than writing prescriptions). Referrals are rare (fewer than 7 percent of the time); patients are given instructions only about half the time and only about one-third of doctors offer any guidance regarding follow-up. As if this is not bad enough, things are much worse in the public sector than in the private sector. Public providers spend about two minutes per patient on average. They ask fewer questions, and in most cases don't touch the patient at all. Mostly, they just ask the patient for a diagnosis and then treat the patient's self-diagnosis. Similar findings were discovered in several countries.[29]

So perhaps the answer is relatively simple: People avoid the public health system because it does not work well. This could also explain why other services that are provided through the government system, like immunizations and antenatal checks for prospective mothers, are underused.

But we know that this cannot be the whole story. Bed nets are not exclusively distributed by the government; neither is Chlorin for purifying water. And even when government nurses do come to work, the

number of patients demanding their services does not go up. There was a period of about six months when a collaborative effort by Seva Mandir, a local NGO, and the district authorities was effective in sharply reducing absenteeism—the probability of finding someone in the health center went up from a dismal 40 percent to over 60 percent. But that had no effect on the number of clients who came to the facilities.[30]

In another Seva Mandir initiative, the NGO organized monthly immunization camps in the same set of villages. This was in reaction to abysmally low immunization rates in the area: Less than 5 percent of the children had been receiving the basic package of immunizations (as defined by WHO and UNICEF) before the NGO got involved. Given the very broad consensus that immunization saves lives (2 to 3 million people are estimated to die from vaccine-preventable diseases every year) and the low cost (for the villagers, it is free), this seems like something that would be a priority for every parent. The low immunization rates, it was widely held, must have been the result of the delinquency of the nurses. Mothers would just get tired of walking all the way there with a young child and not finding the nurse.

To solve this problem, in 2003, Seva Mandir decided to start its own camps, which were widely advertised, held monthly on the same date, and as our data confirm, took place with clocklike regularity. This led to some increase in the immunization rate: In the camp villages, on average 77 percent of children received at least one shot. But the problem was in completing the course. Overall, from the 6 percent in a set of control villages, full immunization rates increased to 17 percent in the camp villages. But even with high-quality, privately provided free immunization services, available right at the parents' doorsteps, eight out of ten children remained without full immunization.

We must therefore accept the possibility that if people do not go to the public health centers, it is also in part because they are not particularly interested in receiving the services they offer, including immunizations. Why do poor people demand so much (bad) health care, but show such indifference toward these preventive services, and more generally toward all the wonderful, cheap gains that the medical profession has invented for them?

UNDERSTANDING HEALTH-SEEKING BEHAVIOR

Does Free Mean Worthless?

If people do not take advantage of cheap preventive technologies to improve their health, could it be precisely because the cheap technologies are cheap?

This is not as implausible as it might seem. Plain vanilla economic rationality dictates that the cost, once paid or "sunk," should not have any effect on usage, but there are many who claim that, as is often the case, economic rationality gets it wrong. In fact, there is a "psychological sunk cost" effect—people are more likely to make use of something they have paid a lot for. In addition, people may judge quality by price: Things may be judged to be valueless precisely because they are cheap.

All of these possibilities are important because health is one place where even free market economists have traditionally supported subsidies and, as a result, most of these cheap gains are made available at below-market prices. The logic is simple: A bed net protects not only the child who sleeps under it, but also other kids who are not getting malaria from that child. A nurse who treats diarrhea with ORS rather than antibiotics prevents the spread of drug resistance. The immunized child who avoids mumps helps protect his or her classmates as well. If making these technologies cheaper ensures that more people use them, everyone else will gain, too.

On the other hand, if people are subject to a sunk-cost effect, for example, these subsidies can backfire—usage will be low *because* the price is so low. In *The White Man's Burden,*[31] William Easterly seems to suggest that this is what is going on. He points to examples of subsidized bed nets being used as wedding veils. Others talk about toilets being used as flowerpots or, more graphically, condoms being used as balloons.

However, there are now a number of careful experiments that suggest that such anecdotes are oversold. Several studies that have tested whether people use things less because they got them for free found no evidence of such behavior. Recall Cohen and Dupas's TAMTAM experiments, which found that people are much more likely to buy

bed nets when they are very cheap or free. Do these subsidized bed nets actually get used? To figure this out, a few weeks after the initial experiment, TAMTAM sent field officers to the homes of people who had purchased nets at the various subsidized prices. They found that between 60 percent and 70 percent of women who had acquired a net were indeed using it. In another experiment, over time usage went up to about 90 percent. Furthermore, they found no difference in usage rates among those who had paid for them and those who had not. The same kinds of results, which rule out the possibility that subsidies are to blame for low usage, have now been found in other settings.

But if subsidies are not the cause, what is?

Faith?

Abhijit grew up in a family that came from two different ends of India. His mother was from Mumbai, and in her family no meal could be considered complete without the unleavened breads called *chapatis* and *bhakris*, made from wheat and millet. His father was from Bengal, where people eat rice with pretty much every meal. The two regions also have very different views about how to treat fevers. Every Maharashtrian mother knows that rice aids in a fast recovery. In Bengal, on the other hand, rice is forbidden: When a Bengali wants to say that someone has recovered from a fever, he says that "he was allowed rice today." When a puzzled six-year-old Abhijit asked his Bengali aunt about this apparent contradiction, she said that it had to do with faith.

Faith, or to use the more secular equivalents, a combination of beliefs and theories, is clearly a very important part of how we all navigate the health system. How else do we know that the medicine that we were prescribed will make the rash better and that we shouldn't apply leeches instead? In all likelihood, none of us has observed a randomized trial where some people with, say, pneumonia were given antibiotics and others were offered leeches. Indeed, we do not even have any direct evidence that such a trial ever took place. What assures us is a belief in the way drugs get certified by the Food and Drug Administration (FDA) or its equivalent. We feel—sometimes wrongly, given the financial incentives to manipulate medical trials—that an

antibiotic would not be on the market if it had not gone through some kind of reliable trial; we trust the FDA to make sure the antibiotic is safe and effective.

The point is not at all to imply that our decision to trust doctors' prescriptions is wrong, but rather to underscore the fact that a lot of beliefs and theories for which we have little or no direct evidence contribute to that trust. Whenever this trust erodes for some reason in rich countries, we witness backlashes against conventionally accepted best practices. Despite the continuous reassurance by high-powered medical panels that vaccines are safe, there are a number of people in the United States and the United Kingdom, for example, who refuse to immunize their children against measles because of a supposed link with autism. The number of measles cases is growing in the United States, even as it is declining everywhere else.[32] Consider the circumstances of average citizens of a poor country. If people in the West, with all of the insights of the best scientists in the world at their disposal, find it hard to base their choices on hard evidence, how hard must it be for the poor, who have much less access to information? People make their choices based on what makes sense to them, but given that most of them have not had rudimentary high school biology and have no reason, as we saw, to trust the competence and professionalism of their doctors, their decision is essentially a shot in the dark.

For example, the poor in many countries seem to have the theory that it is important that medicine be delivered directly to the blood—this is why they want injectables. To reject this (plausible) theory, you have to know something about the way the body absorbs nutrients through the digestive tract and something about why proper sterilization of needles requires high temperatures. In other words, you need at least high school biology.

To make matters worse, learning about health care is inherently difficult not only for the poor, but for everyone.[33] If patients are somehow convinced that they need shots to get better, there is little chance that they could ever learn they are wrong. Because most diseases that prompt visits to the doctor are self-limiting (i.e., they will disappear no matter what), there is a good chance that patients will feel better after a single shot of antibiotics. This naturally encourages spurious

causal associations: Even if the antibiotics did nothing to cure the ailment, it is normal to attribute any improvement to them. By contrast, it is not natural to attribute causal force to inaction: If a person with the flu goes to the doctor, and the doctor does nothing, and the patient then feels better, the patient will correctly infer that it was not the doctor who was responsible for the cure. And rather than thanking the doctor for his forbearance, the patient will be tempted to think that it was lucky that everything worked out this time but that a different doctor should be seen for future problems. This reaction creates a natural tendency to overmedicate in a private, unregulated market. This is compounded by the fact that, in many cases, the prescriber and the provider are the same person, either because people turn to their pharmacists for medical advice, or because private doctors also stock and sell medicine.

It is probably even harder to learn from experience about immunization, because it does not fix an existing problem, but rather protects against potential future problems. When a child is immunized against measles, that child does not get measles. But not all children who are not immunized actually contract measles (especially if others around them who are the potential source of infection are immunized), so it is very difficult to draw a clear link between immunization and the lack of disease. Moreover, immunization just prevents some diseases—there are many others—and uneducated parents do not necessarily understand what their child is supposed to be protected against. So when the child gets sick despite being immunized, the parents feel cheated and probably resolve not to go through with it again. They may also not understand why all the different shots in the basic immunization regime are needed—after two or three shots, parents might feel that they have done what they should. It is all too easy to get misleading beliefs about what might work in health.

Weak Beliefs and the Necessity of Hope

There is potentially another reason the poor may hold on to beliefs that might seem indefensible: When there is little else they can do, hope becomes essential. One of the Bengali doctors we spoke to ex-

plained the role he plays in the lives of the poor as follows: "The poor cannot really afford to get treated for anything major, because that involves expensive things like tests and hospitalization, which is why they come to me with their minor ailments, and I give them some little medicines which make them feel better." In other words, it is important to keep doing something about your health, even if you know that you are not doing anything about the big problem.

In fact, the poor are much less likely to go to the doctor for potentially life-threatening conditions like chest pains and blood in their urine than with fevers and diarrhea. The poor in Delhi spend as much on short-duration ailments as the rich, but the rich spend much more on chronic diseases.[34] So it may well be that the reason chest pains are a natural candidate for being a *bhopa* disease (an older woman once explained to us the dual concepts of *bhopa* diseases and doctor diseases—*bhopa* diseases are caused by ghosts, she insisted, and need to be treated by traditional healers), as are strokes, is precisely that most people cannot afford to get them treated by doctors.

It is probably for the same reason that in Kenya, traditional healers and preachers have been particularly in demand to cure HIV/AIDS (their services are proudly advertised on hand-painted billboards in every town). There was not much that allopathic doctors could really do (at least until anti-retrovirals became more affordable), so why not try the traditional healer's herbs and spells? They were cheap and at the very least gave the patient a sense of doing something. And since symptoms and opportunistic infections come and go, it is possible to believe, at least for a little while, that they have an effect.

This kind of grasping at straws is not specific to poor countries. This is also what the privileged few in poor countries and the citizens of the First World do when they face a problem that they do not know how to remedy. In the United States, depression and back pains are two conditions that are both poorly understood and debilitating. This is why Americans are constantly going between psychiatrists and spiritual healers, or yoga classes and chiropractors. Since both conditions come and go, sufferers go through cycles of hope and disappointment, each time wanting to believe for a moment at least that the new cure must be working.

Beliefs that are held for convenience and comfort may well be more flexible than beliefs that are held out of true conviction. We saw signs of this in Udaipur. Most people who go to the *bhopa* also go to the Bengali doctor and the government hospital and do not seem to stop to think about the fact that these represent two entirely different and mutually inconsistent belief systems. They do talk about *bhopa* diseases and doctor diseases, but when a disease persists they seem not to insist on this distinction, and are willing to use both.

The issue of what beliefs mean to people came up a lot when Seva Mandir was considering what it could do to improve immunization, after discovering that even its system of well-run monthly camps left four-fifths of children not fully immunized. Some local experts argued that the issue was rooted in people's belief systems. They claimed that immunization had no place in the traditional belief system—in rural Udaipur, among other places, traditional belief has it that children die because they catch the evil eye, and the way to catch the evil eye is by being displayed in public. This is why parents don't take their children outside for the first year of life. Given this, the skeptical experts argued, it would be exceedingly difficult to convince villagers to immunize their children without first changing their beliefs.

Notwithstanding these strong views, when Seva Mandir set up immunization camps in Udaipur, we managed to convince Neelima Khetan, Seva Mandir's CEO, to try something on a pilot basis: offer 2 pounds of dal (dried beans, a staple in the area) for each immunization and a set of stainless steel plates for completing the course. The doctor in charge of Seva Mandir's health program was initially quite reluctant to try this out. On the one hand, it seemed wrong to bribe people to do the right thing. They should learn on their own what is good for their health. On the other hand, the incentive we proposed seemed much too weak. If people do not immunize their children, given the huge benefits of doing so, they must have some strong reason behind it. If they believed, for example, that taking their children out would cause harm, 2 pounds of dal (worth only 40 rupees, or $1.83 USD PPP, less than half the daily wage earned by working in a public works site) was not going to persuade them. We had known people at Seva Mandir for long enough that we could persuade them that this was still an idea

worth trying on a small scale, and thirty camps with incentives were established. They were a roaring success. The immunization rate in the village where the camps were set up increased sevenfold, to 38 percent. In all neighboring villages, within about 6 miles, it was also much higher. Seva Mandir discovered that offering the dal, paradoxically, actually lowered the cost per immunization by increasing efficiency, because the nurse, whose time was already paid for, was kept busy.[35]

Seva Mandir's immunization program is one of the most impressive we have ever evaluated, and probably the one that has saved the most lives. We are therefore working, with Seva Mandir and others, to encourage replications of this experiment in other contexts. Interestingly, we are running into some resistance. Doctors point out that 38 percent is far from the 80 percent or 90 percent required to achieve "herd immunity," the rate at which an entire community is fully protected: WHO targets 90 percent coverage nationally for the basic immunization, and 80 percent in every subunit. For some in the medical community, if full protection for the community is not going to be achieved, there is no reason to subsidize some households to do what they should do for their own good anyway. Although it would certainly be excellent to be able to get to full coverage, this "all or nothing" argument is only superficially sensible: Even if immunizing my own child does not contribute to eradicating the disease, it still protects not only my child but also others around him.[36] There is thus still a huge social benefit from increasing full immunization rates against basic diseases from 6 percent to 38 percent.

In the end, the mistrust of incentives for immunization comes down to an article of faith for both those on the right and the left of the mainstream political spectrum: Don't try to bribe people to do things that *you* think they ought to do. For the right, this is because it will be wasted; for the conventional left, which includes much of the public health community and the good doctor from Seva Mandir, this is because it degrades both what is given and the person who gets it. Instead, we should focus on trying to convince the poor of the benefits of immunization.

We think that both of these views are somewhat wrongheaded ways to think about this and other similar problems, for two reasons. First,

what the 2-pounds-of-dal experiments demonstrate is that in Udaipur at least, the poor might appear to believe in all kinds of things, but there is not much conviction behind many of those beliefs. They do not fear the evil eye so much that they would pass up the dal. This must mean that they actually know they are in no position to have a strong basis to evaluate the costs and benefits of vaccines. When they actually know what they want—marrying their daughter to someone from the right caste or religion, to take an unfortunate but important example—they are not at all easy to bribe. So, although some beliefs the poor have are undoubtedly strongly held, it is a mistake to consider that it is always the case.

There is a second reason this is wrong. Both the right wing and the left wing seem to assume that action follows intention: that if people were convinced of the value of immunization, children would be immunized. This is not always true, and the implications are far-reaching.

New Year's Resolutions

One obvious sign that resistance to immunization is not very deep is that 77 percent of children received the first vaccine in the villages where the camps did not offer dal: People seem to be willing to start the immunization process, even without any incentives. The problem is to get them to complete it. This is also why the full immunization rate does not go beyond 38 percent—the incentives make people come a few more times, but not enough to get the full five shots, despite the free stainless steel plates that wait for them if they complete the course.

It seems that this might have a lot to do with the reason that, year after year, we have trouble sticking to our New Year's resolution to go to the gym regularly, despite knowing that it may save us from a heart attack down the line. Research in psychology has now been applied to a range of economic phenomena to show that we think about the present very differently from the way we think about the future (a notion referred to as "time inconsistency").[37] In the present, we are impulsive, governed in large part by emotions and immediate desire: Small losses of time (standing in line to get the child immunized) or petty discom-

forts (glutes that need to be woken up) that have to be endured right now feel much more unpleasant in the moment than when we think about them without a sense of immediacy (say, after a Christmas meal that was heavy enough to rule out all thoughts of immediate exercise). The reverse, of course, goes for small "rewards" (candy, a cigarette) that we really crave in the present; when we plan for the future, the pleasure from these treats seems less important.

Our natural inclination is to postpone small costs, so that they are borne not by our today self but by our tomorrow self instead. This is an idea that we will see again in future chapters. Poor parents may even be fully convinced of the benefits of immunization—but these benefits will accrue sometime in the future, while the cost is incurred today. It makes sense, from today's perspective, to wait for tomorrow. Unfortunately, when tomorrow becomes today, the same logic applies. Likewise, we may want to postpone the purchase of a bed net or a bottle of Chlorin until later, because we have better use for the money right now (there is someone frying delicious conch fritters across the street, say). It is easy to see how this could explain why a small cost discourages the use of a life-saving device, or why small incentives encourage it. The 2 pounds of dal works because it is something that the mother receives today, which compensates her for the cost she bears for getting her child immunized (the couple of hours spent bringing her child to the camp or the low fever that the shot sometimes causes).

If this explanation is correct, it suggests a new rationale for mandating specific preventive health behaviors or for providing financial incentives that go beyond the traditional economic argument we have already suggested, which is that it makes sense for society to subsidize or enforce behaviors that have benefits for others. Fines or incentives can push individuals to take some action that they themselves consider desirable but perpetually postpone taking. More generally, time inconsistency is a strong argument for making it as easy as possible for people to do the "right" thing, while, perhaps, leaving them the freedom to opt out. In their best-selling book *Nudge: Improving Decisions About Health, Wealth, and Happiness,* Richard Thaler and Cass Sunstein, an economist and a law scholar from the University of Chicago, recommend a number of

interventions to do just this.[38] An important idea is that of default option: The government (or a well-meaning NGO) should make the option that it thinks is the best for most people the default choice, so that people will need to actively move away from it if they want to. So people have the right to choose what they want, but there is a small cost of doing so, and as a result, most people end up choosing the default option. Small incentives, like giving dal for vaccines, are another way to nudge people, by giving them a reason to act today, rather than indefinitely postpone.

The key challenge is to design "nudges" tailored to the environment of developing countries. For example, the key challenge with chlorinating water at home is that you have to remember to do it: The bleach has to be purchased, and the right number of drops have to be put in before anyone drinks the water. This is what is so great about piped water—it comes chlorinated to our homes; we don't need to think about it. How does one nudge people to chlorinate their drinking water, where piped water is not available? Michael Kremer and his colleagues came up with one method: a (free) chlorine dispenser, called "one turn," installed next to the village well, where everybody goes to get water, which delivers the right quantity of chlorine at one turn of a knob. This makes the chlorination of water as easy as possible, and because that leads many people to add chlorine every time they collect water, this is the cheapest way to prevent diarrhea among all the interventions for which there is evidence from randomized trials.[39]

We were less fortunate (or, more likely, less competent) when we designed a program for the iron fortification of flour with Seva Mandir to deal with rampant anemia. We had tried to design the program with a built-in "default" option: A household had to decide once and only once whether it wanted to participate. The flour of a participating household would then always be fortified. But unfortunately, the incentive of the millers (who were paid a flat fee regardless of how much flour they fortified) was to start from the opposite default option: not to fortify unless the household required it. As we discovered, the small cost of having to insist on fortification was large enough to discourage most people.[40]

Nudging or Convincing?

In many cases, time inconsistency is what prevents our going from intention to action. In the specific case of immunization, however, it is hard to believe that time inconsistency by itself would be sufficient to make people permanently postpone the decision if they were fully cognizant of its benefits. For people to continuously postpone getting their children immunized, they would need to be constantly fooled by themselves. Not only do they have to think that they prefer to spend time going to the camp next month rather than today, they also have to believe that they will indeed go next month. We are certainly somewhat naïve and overconfident about our own ability to do the right thing in the future. But if parents actually believe in the benefits of immunization, it seems unlikely that they can keep fooling themselves month after month by pretending that they will do it next month until the entire two-year window runs out and it is too late. As we will see later in the book, the poor find ways to force themselves to save despite themselves, which requires a great deal of sophisticated financial thinking. If they really believed that immunization is as wonderful as WHO believes it to be, they would probably have figured out a way to overcome their natural tendency to procrastinate. The more plausible explanation is that they procrastinate *and* they underestimate the benefits.

Nudges may be especially helpful when, for whatever reason, households are somewhat dubious about the benefits of what is being proposed to them. This makes preventive care a doubly appropriate candidate for such policies: The benefits are in the future, and in any case, it is hard to understand exactly what they are. The good news is that nudges may also help with the convincing, which may jump-start a positive feedback loop. Remember the bed nets that were given to a poor Kenyan family? We argued earlier that, on its own, the income gain from the first bed net was not large enough to make the child who got one buy one for his own children: Even if the bed net led to an increase in income of 15 percent for a child, that income gain increases their probability to buy a net only by 5 percent. However, the income

effect is not the whole story: The family may observe that when they use a net, their children are sick less often. Moreover, they may also learn that it is easier to use bed nets and less unpleasant to sleep under bed nets than they had initially believed. In one experiment, Pascaline Dupas tested this hypothesis by making a second attempt to sell bed nets to the families that were previously offered very cheap or free nets, as well as to the families that were offered nets at full price and mostly did not buy one.[41] She found that families that were offered a free or sharply reduced net were *more* likely to buy a second net (even though they had one already) than the families that were asked to pay full price for the first one. Moreover, she also found that knowledge travels: Friends and neighbors of those who were given a free net were also more likely to buy a net themselves.

THE VIEW FROM OUR COUCH

The poor seem to be trapped by the same kinds of problems that afflict the rest of us—lack of information, weak beliefs, and procrastination among them. It is true that we who are not poor are somewhat better educated and informed, but the difference is small because, in the end, we actually know very little, and almost surely less than we imagine.

Our real advantage comes from the many things that we take as given. We live in houses where clean water gets piped in—we do not need to remember to add Chlorin to the water supply every morning. The sewage goes away on its own—we do not actually know how. We can (mostly) trust our doctors to do the best they can and can trust the public health system to figure out what we should and should not do. We have no choice but to get our children immunized—public schools will not take them if they aren't—and even if we somehow manage to fail to do it, our children will probably be safe because everyone else is immunized. Our health insurers reward us for joining the gym, because they are concerned that we will not do it otherwise. And perhaps most important, most of us do not have to worry where our next meal will come from. In other words, we rarely need to draw upon our limited endowment of self-control and decisiveness, while the poor are constantly being required to do so.

We should recognize that no one is wise, patient, or knowledgeable enough to be fully responsible for making the right decisions for his or her own health. For the same reason that those who live in rich countries live a life surrounded by invisible nudges, the primary goal of health-care policy in poor countries should be to make it as easy as possible for the poor to obtain preventive care, while at the same time regulating the quality of treatment that people can get. An obvious place to start, given the high sensitivity to prices, is delivering preventive services for free or even rewarding households for getting them, and making getting them the natural default option when possible. Free Chlorin dispensers should be put next to water sources; parents should be rewarded for immunizing their children; children should be given free deworming medicines and nutritional supplements at school; and there should be public investment in water and sanitation infrastructure, at least in densely populated areas.

As public health investments, many of these subsidies will more than pay for themselves in the value of reduced illness and death, and higher wages—children who are sick less often go to school more and earn more as adults. This does not mean that we can assume that these will automatically happen without intervention, however. Imperfect information about benefits and the strong emphasis people put on the immediate present limit how much effort and money people are willing to invest even in very inexpensive preventive strategies. And when they are not inexpensive, there is of course always the question of money. As far as treatment is concerned, the challenge is twofold: making sure that people can afford the medicines they need (Ibu Emptat, for one, clearly could not afford the asthma medicine that her son needed), but also restricting access to medicines they don't need as a way to prevent growing drug resistance. Because regulating who sets up a practice and decides to call himself a doctor seems to be beyond the control of most governments in developing countries, the only way to reduce the spread of antibiotic resistance and the overuse of high-potency drugs may be to put maximal effort into controlling the sale of these drugs.

All this sounds paternalistic, and in a way, it certainly is. But then it is easy, too easy, to sermonize about the dangers of paternalism and the need to take responsibility for our own lives, from the comfort of

our couch in our safe and sanitary home. Aren't we, those who live in the rich world, the constant beneficiaries of a paternalism now so thoroughly embedded into the system that we hardly notice it? It not only ensures that we take care of ourselves better than we would if we had to be on top of every decision, but also, by freeing us from having to think about these issues, it gives us the mental space we need to focus on the rest of our lives. This does not absolve us of the responsibility of educating people about public health. We do owe everyone, the poor included, as clear an explanation as possible of why immunization is important and why they have to complete their course of antibiotics. But we should recognize—indeed assume—that information alone will not do the trick. This is just how things are, for the poor, as for us.

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Top of the Class

In summer 2009, in the village of Naganadgi in the state of Karnataka, India, we met Shantarama, a forty-year-old widow and mother of six. Her husband had died four years before, entirely unexpectedly, of appendicitis. His life was not insured, nor was there any pension that the family was entitled to. The three eldest children had each gone to school at least until eighth grade, but the next two—a ten-year-old boy and a fourteen-year-old girl—had dropped out. The girl was working in a neighbor's field. We assumed that the death of the father had forced the family to withdraw the children from school and send all the older ones to work.

Shantarama set us straight. After her husband died, she had rented out the fields they owned and started to work as a casual laborer. She earned enough to take care of their basic needs. The girl was indeed sent to work in the fields, but only after she dropped out, because the mother did not want her idling at home. The rest of the children had stayed on in school—out of the three oldest children, two were still students when we met them (the oldest, who was married and twenty-two, was expecting her first child). We learned that the oldest boy was in college in Yatgir, the nearest town, studying to be . . . a teacher. The two middle children were out of school only because they absolutely refused to go.

There were several schools near the village, including a government school and a few private schools. Those two children had been enrolled at the government school, but they had both run away countless times before their mother abandoned any hope of being able to make them attend. The ten-year-old boy, who was with his mother when we interviewed her, mumbled something about school being boring.

Schools are available. In most countries, they are free, at least at the primary level. Most children are enrolled. And yet in the various surveys that we have conducted around the world, child absentee rates vary between 14 percent and 50 percent.[1] Absence often does not seem to be driven by an obvious need at home. Although some of it might reflect ill health—for example, in Kenya when children were treated for intestinal worms, they missed fewer days of school[2]—much of it probably reflects children's unwillingness to be in school (which might well be universal, as most of us will remember from our childhood) and also the fact that their parents do not seem to be able, or willing, to make them go.

For some critics, this is a sign of the catastrophic failure of an establishment-led effort to increase education from the top down: Building schools and hiring teachers is useless if there is no strong underlying demand for education; conversely, if there is real demand for skill, a demand for education will naturally emerge, and supply will follow. However, this optimistic view seems to be inconsistent with the story of Shantarama's children. There is certainly no shortage of demand for educated people in Karnataka, whose capital is Bangalore, India's IT hub. The family, with a future teacher among its members, was both aware of the value of education and willing to invest in it.

So if the failure of schools in developing countries to attract children can't be explained by problems of access, or lack of demand for educated labor, or parental resistance to educating their children, then where is the snag?

SUPPLY-DEMAND WARS

Education policy, like aid, has been the subject of intense policy debates. As in the case of aid, the debate is not about whether education

per se is good or bad (everyone probably agrees it is better to be educated than not educated). It centers instead on whether governments ought to, or know how to, intervene. And though the specific reasons invoked are different, the fault line divides the field essentially in the same place it divides it on the subject of aid, with the aid optimists being generally education interventionists, and the aid pessimists being in favor of laissez-faire.

A large majority of policy makers, at least in international policy circles, have traditionally taken the view that the problem is essentially simple: We have to find a way to get the children into a classroom, ideally taught by a well-trained teacher, and the rest will take care of itself. We will call these people, who emphasize the "supply of schooling," the "supply wallahs," appropriating the Indian term for "purveyor of" (as in the western Indian surnames Lakdawala [wood supplier], Daruwala [booze supplier], and Bandukwala [gun seller]), to avoid confusing them with supply-siders, the economists who think Keynes got everything wrong and are in fact largely opposed to any form of government intervention.

Perhaps the most visible articulation of the supply wallah position can be found in the UN's Millennium Development Goals (MDG), the eight goals that the world's nations agreed in 2000 to reach by 2015. The second and third MDGs are, respectively, to "ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling" and to "eliminate gender disparity in primary and secondary education, preferably by 2005, and in all levels of education no later than 2015." Most national governments seem to have bought into this idea. In India, 95 percent of children now have a school within a half mile or so.[3] Several African countries (including Kenya, Uganda, and Ghana) have made primary education free, and children have flooded the schools. According to UNICEF, between 1999 and 2006, enrollment rates in primary school in sub-Saharan Africa increased from 54 percent to 70 percent. In East and South Asia, they increased from 75 percent to 88 percent over the same period. Worldwide, the number of children of school age who were out of school fell from 103 million in 1999 to 73 million in 2006. In our eighteen-country data set, even among the extremely poor (those who

live on less than 99 cents a day), enrollment rates are now above 80 percent in at least half the countries for which we have data.

Access to secondary school (ninth grade and above) is not part of the MDGs, but even there, progress has been made. Between 1995 and 2008, secondary gross enrollment ratios increased from 25 percent to 34 percent in sub-Saharan Africa, from 44 percent to 51 percent in South Asia, and from 64 percent to 74 percent in East Asia,[4] despite the fact that the costs of secondary schools are much higher: Teachers are expensive, because they need to be better qualified, and for parents and children the value of the forgone earnings, and the forgone labor-market experience, is much larger because teenage children can work and earn money.

Getting children into school is a very important first step: This is where learning starts. But it isn't very useful if they learn little or nothing once they're there. Somewhat bizarrely, the issue of learning is *not* very prominently positioned in international declarations: The Millennium Development Goals do not specify that children should learn anything in school, just that they should complete a basic cycle of education. In the final declaration of the Education for All Summit in Dakar in 2000, sponsored by the United Nations Educational, Scientific and Cultural Organization (UNESCO), the goal of improving the quality of education is mentioned only in the sixth position—out of six goals. The implicit assumption, presumably, was that learning would follow from enrollment. But unfortunately things aren't that simple.

In 2002 and 2003, the World Absenteeism Survey, led by the World Bank, sent unannounced surveyors to a nationally representative sample of schools in six countries. Their basic conclusion was that teachers in Bangladesh, Ecuador, India, Indonesia, Peru, and Uganda miss one day of work out of five on average, and the ratio is even higher in India and Uganda. Moreover, the evidence from India suggests that even when teachers are in school and are supposed to be in class, they are often found drinking tea, reading the newspaper, or talking to a colleague. Overall, 50 percent of teachers in Indian public schools are not in front of a class at a time they should be.[5] How are the children supposed to learn?

In 2005, Pratham, an Indian NGO focused on education, decided to go one step further and find out what children were really learning. Pratham was founded in 1994 by Madhav Chavan, a U.S.-educated chemical engineer with an unflappable belief that all children should, and can, learn to read and read to learn. He has taken Pratham from a small Mumbai-based UNICEF-sponsored charity to one of the largest NGOs in India, perhaps in the world: Pratham's programs reach close to 34.5 million children all over India and are now venturing into the rest of the world. Under the banner of the Annual State of Education Report (ASER), Pratham formed volunteer teams in all 600 Indian districts. These teams tested more than 1,000 children in randomly chosen villages in every district—700,000 children overall—and came up with a report card. One of the leading lights of the ruling Congress-led government, Montek Singh Ahluwalia, launched the report, but what he read could not have made him happy. Close to 35 percent of children in the seven-to-fourteen age group could not read a simple paragraph (first-grade level) and almost 60 percent of children could not read a simple story (second-grade level). Only 30 percent could do second-grade mathematics (basic division).[6] The math results are particularly stunning—all over the Third World, little boys and girls who help their parents in their family stall or store do much more complicated calculations all the time, without the help of pen and paper. Are schools actually making them unlearn?

Not everyone in the government was as gracious as Mr. Ahluwalia. The government of the state of Tamil Nadu refused to believe that it was really doing as badly as the ASER data seemed to imply and ordered its own teams to conduct a retest, which unfortunately only served to reinforce the bad news. These days in India, in an annual ritual in January, ASER results are released. Newspapers express dismay at the poor scores, academics talk about the statistics in panel discussions, and very little changes.

Unfortunately, India is not unique: Very similar results have been found in neighboring Pakistan, in distant Kenya, and in several other countries. In Kenya, the Uwezo Survey, modeled on ASER, found that 27 percent of children in fifth grade could not read a simple paragraph

in English, and 23 percent could not read in Kiswahili (the two languages of instruction in primary school). Thirty percent could not do basic division.[7] In Pakistan, 80 percent of children in third grade could not read a first-grade-level paragraph.[8]

The Demand Wallahs' Case

For the "demand wallahs," a set of critics (including William Easterly) who believe that there is no point in supplying education unless there is a clear demand for it, these results encapsulate everything that has been wrong with education policy in the last few decades. In their view, the quality of education is low because parents do not care enough about it, and they don't because they know that the actual benefits (what economists call the "returns" to education) are low. When the benefits of education become high enough, enrollment will go up, without the state having to push it. People will send their children to private schools that will be set up for them, or if that is too expensive, they will demand that local governments set up schools.

The role of demand is indeed critical. School enrollment is sensitive to the rate of returns to education: During the Green Revolution in India, which raised the level of technical know-how needed to be a successful farmer and thereby increased the value of learning, education increased faster in regions that were better suited to the new seeds introduced by the Green Revolution.[9] More recently, there is the example of the offshore call centers. In Europe and the United States, they are usually vilified for taking away local jobs, but they have been part of a small social revolution in India by dramatically expanding young women's employment opportunities. In 2002, Robert Jensen of the University of California at Los Angeles teamed up with some of these centers to organize recruiting sessions for young women in randomly selected villages in rural areas where recruiters would typically not go, in three states in northern India. Not surprisingly, compared to other randomly chosen villages that did not see any such recruiting efforts, there was an increase in the employment of young women in business process outsourcing centers (BPOs) in these villages. Much

more remarkably, given that this is the part of India probably most notorious for discrimination against women, three years after the recruiting started, girls age five to eleven were about 5 percentage points more likely to be enrolled in school in the villages where there was recruiting. They also weighed more, suggesting that parents were taking better care of them: They had discovered that educating girls had economic value, and were happy to invest.[10]

Since parents are able to respond to changes in the need for an educated labor force, the best education policy, for the demand wallahs, is no education policy. Make it attractive to invest in business requiring educated labor and there will be a need for an educated labor force, and therefore a pressure to supply it. And then, the argument continues, since parents will start to really care about education, they will also put pressure on teachers to deliver what they need. If public schools cannot provide quality education, a private-school market will emerge. Competition in this market, they argue, will ensure that parents get the quality of schooling that they need for their children.

At the core of the demand wallahs' view is the idea that education is just another form of investment: People invest in education, as they invest in anything else, to make more money—in the form of increased earnings in the future. The obvious problem with thinking of education as an investment is that parents do the investing and children get the benefits, sometimes much later. And though many children do, in effect, "repay" parents for the investment by taking care of them in old age, many others do so only reluctantly, or they simply "default," abandoning their parents along the way. Even when the children turn out to be dutiful, it is not always clear that the extra bit of money that they earn because they spent that extra year in school translates into that much more for the parents—we have certainly come across parents who rue the day when their children became rich enough to move out to their own house, leaving them to their lonely elderly lives. T. Paul Schultz, a Yale economist, talks about his father, the famous economist and Nobel Laureate Theodore Schultz, whose parents were against educating him, because they wanted him to stay back on the farm.

It is true that many parents do take pride and pleasure in the fact that their children are doing well (and in sharing the good news with their neighbors). In this sense they may feel more than adequately repaid even when they don't get a penny from their children. So from the point of view of the parent, education is partly investment but also partly a "gift" that they offer their children. But there is also the flip side: Most parents are in a position of power relative to their children—they decide who goes to school, who stays home or goes out to work, and how their earnings are spent. Parents who are cynical about how much they would get out of a son's earnings once he is old enough to push back, and who do not value education for its own sake, may prefer to take him out of school and send him to work when he is ten. In other words, although the economic return to education (as measured by the extra earnings of an educated child) clearly matters, lots of other things probably matter as well, things like our hopes about the future, our expectations about our children, even how generous we are feeling toward them.

"Exactly," says the supply wallah. "This is why some parents need a push. A civilized society cannot allow a child's right to a normal childhood and a decent education to be held hostage to a parent's whims or greed." Building schools and hiring teachers is a necessary first step to lower the cost of sending a child to school, but it may not be enough. This rationale explains why most rich countries simply give parents no choice: Children have to be sent to school until a certain age, unless parents can prove they are educating them at home. But this clearly does not work where state capacity is more limited and compulsory education cannot be enforced. In such cases, the government must make it financially worthwhile for parents to send their children to school. This is the idea behind the new tool of choice in education policy: the conditional cash transfer.

The Curious History of Conditional Cash Transfers

Santiago Levy, a former professor of economics at Boston University, was deputy minister in the Mexican Ministry of Finance from 1994 to 2000, tasked with reforming the intricate welfare system, which was

made of several distinct programs. He believed that by linking the receipt of welfare payments to investment in human capital (health and education), he could ensure that the money spent today could contribute to eradicating poverty, not only in the short term but in the long term as well, by fostering a healthy and well-educated generation. This inspired the design of PROGRESA, a transfer program "with strings attached." PROGRESA was the first conditional cash transfer (CCT) program: It offered money to poor families, but only if their children regularly attended school and the family sought preventive health care. They got more money if the children were in secondary school than in primary school and if it was a girl who went to school rather than a boy. To make it politically acceptable, the payments were presented as "compensation" to the family for the wages lost when their child went to school instead of working. But in reality, the goal was to nudge the family, by making it costly for the family to fail to send their children to school, regardless of what the family thought of education.

Santiago Levy had another goal—to make sure that the program survived the change of government every few years, since each new president usually canceled all his predecessors' programs before launching his own. Levy calculated that if the program was demonstrably a great success, the new government would not find it easy to get rid of it. So he set up a pilot project, which was offered only in a randomly chosen group of villages, making it possible to rigorously compare outcomes in chosen and non-chosen villages. The pilot demonstrated beyond reasonable doubt that such a program does substantially increase school enrollment, particularly at the secondary level. Secondary school enrollment increased from 67 percent to about 75 percent for girls, and from 73 percent to about 77 percent for boys.[11]

This was also one of the first demonstrations of the persuasive power of a successful randomized experiment. When the government duly changed, the program survived, albeit renamed OPORTUNIDADES. But Levy probably did not anticipate that he had given birth to two new traditions. First, CCTs spread like wildfire all over the rest of Latin America, and subsequently to the rest of the world. Mayor Michael Bloomberg even gave them a try in New York City. And second, when

other countries launch their own CCTs, they now usually also carry out a set of randomized trials to evaluate them. In some of these experiments, features of the program are varied, to try to understand how to design it better.

Paradoxically, it was one of these replications, in Malawi, that led us to rethink the success of PROGRESA. The conditionality in PROGRESA is based on the principle that increased income is not enough and that parents need to be given an incentive. Researchers and practitioners started to ask whether an *unconditional* program could have the same effect as a conditional transfer. A World Bank study found, provocatively, that conditionality does not seem to matter at all: The researchers offered the families of school-age girls a transfer ranging between $5 and $20 USD PPP per month. In one group, the transfer was conditional on enrollment. In another, it wasn't. A third group (the control group) did not receive a transfer. The effects were large (after a year, dropout was 11 percent in the control group, and only 6 percent among those who benefited from the transfer), but they were the same for those who received the conditional transfer and for those who got the unconditional one, suggesting that parents did not need to be *forced* to send their children to school, they needed to be helped financially.[12] Subsequently, another study that compared conditional and unconditional transfers in Morocco found similar results.[13]

Several factors probably explain why the financial transfer made a difference in Malawi: Perhaps parents could not pay for school fees, or could not give up the money their children earned. Of course, borrowing to finance the schooling of their ten-year-old based on what she will make at twenty is entirely a pipe dream. The income transfer, by moving parents out of extreme poverty, may also have given the mental space to take a longer view of life: Schooling is something where the costs are paid now (you have to nag—or drag—your children into school now) and it only pays off when they are older.

For all these reasons, income per se matters for education decisions: Jamal will get less education than John because his parents are poorer, even if the income gains from education are the same for both. Indeed, in our eighteen-country data set we find that the share of spending on education increases as we move up from those who live on under 99

cents a day to those in the $6–$10 category. Given that the number of children born to each family goes down sharply with income, this means that education spending per child grows much faster than total consumption. This is the opposite of what we would expect in a world where education is an investment like any other, unless we are willing to believe that the poor are just incapable of getting educated.

This is important, because if parental income plays such a vital role in determining educational investment, rich children will get more education even if they are not particularly talented, and talented poor children may be deprived of an education. So leaving it purely to the market will not allow every child, wherever she comes from, to be educated according to her ability. Unless we can fully erase differences in income, public supply-side intervention that makes education cheaper would be necessary to get close to the socially efficient outcome: making sure that every child gets a chance.

Does Top-Down Education Policy Work?

The question, however, is whether this kind of public intervention, even if it is desirable in principle, is actually feasible. If parents do not care about education, isn't there a risk that such a top-down education drive would just lead to a waste of resources? In *The Elusive Quest for Growth,* Easterly argues, for example, that the investment in education in African countries has not helped these countries to grow.

Once again, the best way to answer this question is to study what happened when specific countries tried it. The good news is that despite the poor quality of education, schools are still useful. In Indonesia, after the first oil boom in 1973, the country's then dictator, General Suharto, decided to go on a school-building spree.[14] It was the classic top-down supply-driven program: Schools were built based on a prespecified rule that gave strict precedence to areas where the number of unschooled children was the highest. If the lack of schools in this area reflected lack of interest in education, this program should have been a miserable failure.

In fact, the INPRES (Instruksi Presiden, or Presidential Instruction) program was a great success: To evaluate it, Esther compared the wages

of adults who, as children, were young enough to have benefited from the newly constructed schools to what the immediately older generation (people who were just old enough to have missed their chance to go to these schools) was earning. She found that relative to the older generation, the wages of the younger one were significantly higher in areas where more schools were constructed. Putting together the effect on education and on wages, she concluded that every extra year of primary school due to the new school raised wages by about 8 percent. This estimate of the returns to education is very similar to what is commonly found in the United States.[15]

Another classic top-down program is compulsory schooling. In 1968, Taiwan instituted a law that made it mandatory for all children to complete nine years of schooling (the previous law only required six years of school attendance). This law had a significant positive effect on the schooling of both boys and girls, as well as on their employment prospects, especially for girls.[16] The benefits of education are not only monetary: The Taiwan program had a large effect on child mortality.[17] In Malawi, girls who did not drop out because of the cash transfer were also less likely to become pregnant. The same results were found in Kenya.[18] There is now a significant body of rigorous evidence testifying to the far-reaching effects of education.

Moreover, this research also concludes that every little bit of education helps. People who are comfortable with reading are more likely to read newspapers and bulletin boards and to find out when there is a government program available for them. People who go on to secondary education are more likely to get a formal-sector job, but even those who don't are able to run their businesses better.

It seems, then, that once again the polarized debate between philosophically opposed strategies largely misses the point. Supply and demand strategies have no reason to be mutually exclusive. Supply by itself does some good, but demand is important, too. There are indeed people who somehow find ways to get educated without any top-down help when the right jobs come to town, but for many others, the impetus from schools being built in their area can be critical.

None of this means that top-down strategies deliver as much as they could, or should. After all, as we saw, the quality of education delivered

in public schools can be dismal. The fact that students are getting *something* out of them does not mean they could not work significantly better. Could it be that demand-based approaches would work better? Private schooling is the canonical demand-driven strategy—the parents must spend their own hard-earned money to put their children into one, even though free public schools are available. Have private schools cracked the problem of the quality of education?

Private Schools

There is a surprising amount of agreement that private schools should play an important role in the process of filling the gaps in the education system. India's Right to Education Act, which was recently passed with strong support across the political spectrum (including the left, which, the world over, has traditionally opposed the role of the market), is a version of what is called voucher privatization—the government gives citizens "vouchers" to pay private-school fees.

Even before the education experts gave it the heads-up, many ambitious low-income parents around the world had decided that they had to get their children into private schools, even if they would have to scrimp for it. This has caused the surprising phenomenon of cut-price private schools all over South Asia and Latin America. The monthly fees in these schools can be as low as $1.50. The schools tend to be quite modest, often just a couple of rooms in someone's house, and the teachers are often local people who couldn't find another job and decided to start a school. One study[19] found that an excellent predictor of the supply of private schools in a Pakistani village is whether a secondary girl's school had been set up in the area a generation earlier. Educated girls, looking for an opportunity to make some money without having to leave the village, were increasingly entering the education business as teachers.

Despite their sometimes dubious credentials, private schools often work better than public schools. The World Absenteeism Survey found that in India, private schools were more likely to be found in villages where the public schools were particularly bad. Furthermore, on average, the private-school teachers were 8 percentage points more likely

to be in school on a given day than public-school teachers in the same village. Children who go to private school also perform better. In India in 2008, according to ASER, 47 percent of government-school students in fifth grade could not read at the second-grade level, compared to 32 percent of private-school students. In the Learning and Educational Achievement in Pakistan Schools (LEAPS) survey, by third grade, children in private schools were 1.5 years ahead in English and 2.5 years in math relative to children in public schools. It is true that families who decide to send their children to private schools may be different. But this could not be entirely explained by the private schools' attracting kids from richer families: The gap in performance between private- and public-school students was close to ten times the average gap between the children from the highest and lowest socioeconomic categories. And though it is not quite so large, there is still a sizable gap between children enrolled in public and private school even within the same family[20] (this may still be an overestimate of the true benefit if parents send their most talented child to private school or also help that child in other ways).[21]

So children in private school learn more than children in public schools. This does not mean, however, that private schools are as efficient as they could be. We see that they are not when we compare the effect of being in private school to the effect of simple interventions.

Pratham Versus Private Schools

Pratham, the remarkable educational NGO that runs ASER, not only exposes the deficiencies of the educational system but also tries to fix them. We have been working with them for the last ten years, evaluating almost every new edition of their program for teaching children arithmetic and reading. Our association started in the year 2000 in western India, in the cities of Mumbai and Vadodara, where Pratham was running what they called the Balsakhi (meaning "children's friend") program. The program took the twenty children in each classroom who most needed help and sent them to work with the balsakhi, a young woman from the community, on their specific areas of weakness. Despite an earthquake and communal riots, the program generated very

large gains in test scores for these children—in Vadodara, about twice the magnitude of the average gains from private schooling that have been found in India.[22] Yet these balsakhis were much less educated than the average private- (or public-) school teacher—many of them had barely ten years of schooling, plus a week's training by Pratham.[23]

Given these results, many organizations would have rested on their laurels. Not Pratham. The idea of resting anywhere, least of all on their laurels, is entirely foreign to Madhav's personality or that of Rukmini Banerji, the human dynamo who is the driving force behind Pratham's spectacular expansion. One way in which Pratham could reach more children was by having communities take over the program. In the Jaunpur District in the eastern part of Uttar Pradesh, India's largest state and one of the poorest, Pratham volunteers went from village to village testing children and encouraging the community to get involved in the testing to see for themselves what their children knew and didn't know. The parents were not thrilled by what they saw—their first instinct often was to try to smack their children—but eventually a set of volunteers from the community emerged, ready to take on the job of helping their little brothers and sisters. They were mostly young college students who held classes in the evening in their neighborhoods. Pratham gave them a week of training but no other compensation.

We evaluated this program as well, and the results were quite dramatic: By the end of the program, *all* the participating children who could not read before the program could at least recognize letters (in contrast, only 40 percent of those in the comparison villages could read letters by the end of the year). Those who could read only letters at the beginning were 26 percent more likely, by the end, to be able to read a short story if they had participated than if they had not.[24]

More recently, Pratham has shifted its focus to working with the government school system. In Bihar, India's poorest state and the state with the highest measured teacher absentee rate, Pratham organized a set of remedial summer camps for schoolchildren in which the teachers from the government school system were invited to come and teach. The results from this evaluation were surprising: The much-maligned government teachers actually taught, and the gains were comparable to the gains from the Jaunpur evening classes.

Pratham's results are striking enough that many school systems in India and around the world are reaching out to the organization. A version of the program is now being tested in Ghana, in a large-scale RCT run as collaboration between a research team and the government: Youth who are looking for a first job experience will be trained to provide remedial education in school. Delegations from the Ministry of Education in Senegal and Mali have visited Pratham's operations and are thinking of replicating the program.

This evidence poses a set of puzzles: If volunteer and semi-volunteer teachers can generate such large gains, private schools can clearly adopt the same kinds of practices and should do even better. Yet we know that in India a full one-third of fifth-graders in private schools cannot read at first-grade level. Why not? If government teachers can teach so well, why don't we see it in the school system? If such large learning gains are so easily available, why don't parents demand them? Indeed, why was it that in Pratham's Jaunpar program, only 13 percent of the children who could not read attended the evening classes?

No doubt, some of the usual reasons that markets do not work as well as they should are at work here. Perhaps there is not enough competitive pressure among private schools, or parents are not sufficiently informed about what they do. Broader issues of political economy that we will discuss later may explain the poor performance of government teachers. But one key issue is unique to education: The peculiar way in which *expectations about what education is supposed to deliver* distort what parents demand, what both public and private schools deliver, and what children achieve—and the colossal waste that ensues.

THE CURSE OF EXPECTATIONS

The Illusory S-Shape

Some years ago we had organized a parent-child collage session in an informal school run by Seva Mandir in rural Udaipur. We had brought a stack of colorful magazines and asked parents to cut some pictures out from them to represent what they thought education would bring to their children. The idea was for them to build a collage with the help of their children.

The collages all ended up looking rather similar: The pictures were studded with gold and diamond jewelry and various recent models of cars. There were other images available in the magazines—peaceful rural vistas, fishing boats, coconut trees—but if the evidence of the collages is to be believed, this is not what education is all about. Parents seem to see education primarily as a way for their children to acquire (considerable) wealth. The anticipated route to those riches is, for most parents, a government job (as a teacher, for example), or failing that, some kind of office job. In Madagascar, parents of children from 640 schools were asked what they thought a child who had completed primary education would do for a living, and what a child who had completed secondary education would do. Seventy percent thought that a secondary-school graduate would surely get a government job, when in fact 33 percent of them actually get those jobs.[25]

Yet very few of these children will make it to sixth grade, let alone pass the graduation exam that, these days, is typically the minimum qualification for any kind of job that has an education requirement. And it is not that parents are fully unaware of this: In Madagascar, where parents were asked their view of the returns to education, it was found that parents get it right *on average*. But they greatly overstate both the upside and the downside. They see education as a lottery ticket, not as a safe investment.

Pak Sudarno, a scrap collector in the slum of Cica Das in Bandung, Indonesia, who, very matter-of-factly told us that he was known to be the "poorest person in the neighborhood," explained this succinctly. When we met him in June 2008, his youngest son (the youngest of nine children) was about to enter secondary school. He thought that the most probable outcome was that after completing secondary school, the boy would get a job in the nearby mall, where his brother was already working. This is a job that he could have had already—but nevertheless, Pak Sudarno thought it was worthwhile for him to complete secondary school, even if it meant three years of forgone salary. His wife thought that the boy might be able to enter a university. Pak Sudarno felt that this was a pipe dream—but he thought that there was some chance that he could get an office job, the best job possible, for the security and respectability it offered. In his view, it was worth taking the chance.

Parents also tend to believe that the first few years of education pay much less than the next ones. For example, in Madagascar, parents believed that each year of primary education would increase a child's income by 6 percent, each year of junior high education by 12 percent, and each year of senior secondary education by 20 percent. We found a very similar pattern in Morocco. There, parents believed that each year of primary education would increase a boy's earning by 5 percent, and each year of secondary education by 15 percent. The pattern was even more extreme for girls. In the view of parents, each year of primary education was worth almost nothing for them: 0.4 percent. But each year of secondary education was perceived to increase earnings 17 percent.

In reality, available estimates show that each year of education increases earnings more or less proportionally.[26] And even for people who do not get a formal-sector job, education seems to help: For example, educated farmers earned more during the Green Revolution than uneducated ones.[27] Moreover, there are also all the other, nonfinancial benefits. In other words, parents see an S-shape where there really isn't one.

This belief in the S-shape means that unless parents are unwilling to treat their children differently from one another, it makes sense for them to put all their educational eggs in the basket of the child they perceive to be the most promising, making sure that she gets enough education, rather than spreading the investment evenly across all their children. A few doors down from Shantarama (the widow whose two children were not in school), in the village of Naganadgi, we met a farming household with seven children. None of them had studied past second grade, except the youngest, a twelve-year-old boy. They were not satisfied with the quality of the government high school, where he had spent a year. So the boy was attending seventh grade in a private boarding school located in the village. A year at school cost the family more than 10 percent of its total income from farming, a considerable commitment for just one child and clearly an impossible expense for seven. The lucky boy's mother explained to us that he was the only intelligent child in the family. The willingness to use words like "stupid" and "intelligent" to refer to one's own children, often in their presence, is entirely consistent with a worldview that puts a large

premium on picking a winner (and in getting everyone else in the family to back the winner). This belief creates a strange form of sibling rivalry. In Burkina Faso, a study found that adolescents were more likely to be enrolled in school when they scored high on a test of intelligence, but they were *less* likely to be enrolled in school when their siblings had scored high.[28]

A study of conditional cash transfer in the city of Bogotá, Colombia, found compelling evidence of the propensity to concentrate resources on one child. The program had limited funds, and parents were offered the option to enter any of their age-eligible children into a lottery. Parents of winners would get a monthly transfer as long as the child attended school regularly. Lottery winners were more likely to attend regularly, more likely to reenroll each academic year, and, in the version of the program where part of the transfer was conditional on college enrollment, much more likely to attend college. The disturbing finding was that in families that entered two or more children and one won, the child who lost the lottery was *less* likely to be enrolled in school than children in families where both lost. This is despite the increase in family income, which should have helped the other child. A winner was picked, and resources were concentrated on him (or her).[29]

Misperception can be critical. In reality, there should not be an education-based poverty trap: Education is valuable at every level. But the fact that parents *believe* that the benefits of education are S-shaped leads them to behave as if there were a poverty trap, and thereby inadvertently to create one.

Elitist School Systems

Parents are not alone in focusing their expectations on success at the graduation exam: The whole education system colludes with them. The curriculum and organization of schools often date back to a colonial past, when schools were meant to train a local elite to be the effective allies of the colonial state, and the goal was to maximize the distance between them and the rest of the populace. Despite the influx of new learners, teachers still start from the premise that their mandate remains to prepare the best students for the difficult exams that, in

most developing countries, act as a gateway either to the last years of school or to college. Associated with this is a relentless pressure to "modernize" the curriculum, toward making it more scientific and science oriented, toward fatter (and no doubt weightier) textbooks—to the point where the Indian government now sets a limit of 6.6 pounds on the total weight of the book bag that first- and second-graders can be asked to carry.

We once followed some Pratham staff to a school in the city of Vadodara, in western India. Their visit was preannounced and the teacher clearly wanted to make a good impression: His idea was to draw an enormously complex figure on the board, representing one of the fiendishly clever proofs that Euclidian geometry is famous for, accompanied by a long lecture about the diagram. All the children (students in third grade) were neatly arranged in rows on the floor, and sat very quietly. Some might have been trying to draw a simulacrum of the figure on their tiny slates, but the quality of the chalk was so low that it was impossible to tell. It was clear that none of them had a clue what was going on.

This teacher was not an exception. We have seen countless examples of this kind of elite bias among teachers in developing countries. In collaboration with Pascaline Dupas and Michael Kremer, Esther helped design a reorganization of Kenyan classrooms, taking advantage of an extra teacher to divide the class in two. Each class was separated by prior achievement, to help children learn what they did not know yet. Teachers were then randomly assigned to the "top" or "bottom" track by a public lottery. Teachers who "lost" the lottery and were assigned to the bottom track were upset, explaining that they wouldn't get anything out of teaching and would be blamed for their students' low scores. And they adjusted their behavior accordingly: During random visits, teachers assigned to the bottom track were less likely to teach, and instead more likely to be having tea in the teachers' room, than those assigned to the top track.[30]

The problem is not the high ambition per se; what makes it really damaging is that it is combined with low expectations of what the students can accomplish. We once went to see some testing of children in Uttarakand, in the foothills of the Indian Himalayas. It was a brilliant

fall day, and it was hard not to feel that the testing was something of an intrusion. The child we were trying to test certainly thought so. He vigorously nodded when we asked him whether he went to school and seemed agreeable enough when we told him we would ask him some questions, but when the interviewer handed him a sheet to read, he resolutely looked the other way, as only a seven-year-old can. The interviewer tried very hard to coax him to just glance at the sheet, promising nice pictures and a fun story, but his mind was made up; his mother kept muttering words of encouragement, but a certain half-heartedness in her efforts suggested that she did not expect him to change his mind. As we walked toward the car after the "interview," an elderly man in a short dusty dhoti (the loincloth farmers wear in the area) and a yellowing T-shirt fell into step with us. "Children from homes like ours . . . ," he said, leaving us to guess the rest. We had seen the same pessimism in the mother's face and in faces of many mothers like her: She was not going to say it, but we were wasting our time.

References to a certain old-fashioned sociological determinism, whether based on caste, class, or ethnicity, are rife in conversations involving the poor. In the late 1990s, a team led by Jean Dreze prepared a report on the state of education in India, the Public Report on Basic Education in India (PROBE). One of the findings was:

> Many teachers are anxious to avoid being posted in remote or "backward" villages. One practical reason is the inconvenience of commuting, or of living in a remote village with poor facilities. . . . Another common reason is alienation from the local residents, who are sometimes said to be squandering their money on liquor, to have no potential for education, or simply to "behave like monkeys." Remote or backward areas are also seen as infertile ground for a teacher's efforts.

A young teacher simply told the team that it was impossible to communicate with "children of uncouth parents."[31]

In a study designed to find out whether this prejudice influenced teachers' behavior with students, teachers were asked to grade a set of exams. The teachers did not know the students, but half of the teachers, randomly chosen, were told the child's full name (which includes

the caste name). The rest were fully anonymous. The study found that, on average, teachers gave significantly lower grades to lower-caste students when they could see their caste than when they could not. But interestingly, it was not the higher-caste teachers who were doing this. The lower-caste teachers were actually *more* likely to assign worse grades to lower-caste students. They must have been convinced these children could not do well.[32]

The combination of elevated expectations and little faith can be quite lethal. As we saw, the belief in the S-shape curve leads people to give up. If the teachers and the parents do not believe that the child can cross the hump and get into the steep part of the S-curve, they may as well not try: The teacher ignores the children who have fallen behind and the parent stops taking interest in their education. But this behavior *creates* a poverty trap even where none exists in the first place. If they give up, they will never find out that perhaps the child could have made it. And in contrast, families that assume that their children can make it, or families that don't want to accept that a child of theirs will remain uneducated, which tend to be, for obvious historical reasons, more elite families, end up confirmed in their "high" hopes. As one of his early teachers likes to recall, when Abhijit was falling behind in his schoolwork in first grade, everyone somehow managed to persuade themselves that this was because he was too far ahead of the class and bored. As a result he was sent up to the next grade, where, once again, he immediately fell behind, to the point where the teacher took to hiding his homework so that the higher-ups would not question the wisdom of having promoted him. If, instead of being the child of two academics, he had been a child of two factory workers, he would almost surely have been assigned to remedial education or asked to leave the school.

Children themselves use this logic when assessing their own abilities. The social psychologist Claude Steele demonstrated the power of what he calls "stereotype threat" in the U.S. context: Women do better on math tests when they are explicitly told that the stereotype that women are worse in math does not apply to this particular test; African Americans do worse on tests if they have to start by indicating their race on the cover sheet.[33] Following Steele's work, two researchers

from the World Bank had lower-caste children in the Indian state of Uttar Pradesh compete against high-caste children in solving mazes.[34] They found that the low-caste children compete well against the high-caste children as long as caste is not salient, but once low-caste children are reminded that they are low castes competing with high-caste children (by the simple contrivance of asking them their full names before the game starts), they do much worse. The authors argue that this may be driven in part by a fear of not being evaluated fairly by the obviously elite organizers of the game, but it could just as well be the internalization of the stereotype. A child who expects to find school difficult will probably blame herself and not her teachers when she can't understand what is being taught, and may end up deciding she's not cut out for school—"stupid," like most of her ilk—and give up on education altogether, daydreaming in class or, like Shantarama's children, just refusing to go.

WHY SCHOOLS FAIL

Because in many developing countries both the curriculum and the teaching are designed for the elite rather than for the regular children who attend school, attempts to improve the functioning of the schools by providing extra inputs have generally been disappointing. In the early 1990s, Michael Kremer was looking for a simple test case to perform one of the first randomized evaluations of a policy intervention in a developing country. For this first attempt, he wanted a noncontroversial example in which the intervention was likely to have a large effect. Textbooks seemed to be perfect: Schools in western Kenya (where the study was to be conducted) had very few of them, and the near-universal consensus was that the books were essential inputs. Twenty-five schools were randomly chosen out of 100, and textbooks (the officially approved books for those classes) were distributed. The results were disappointing. There was no difference in the average test scores of students who received textbooks and those who did not. However, Kremer and his colleagues did discover that the children who were initially doing very well (those who had scores near the top in the test given before study began) made marked improvement in the schools

where textbooks were given out. The story started to make sense. Kenya's language of education is English, and the textbooks were, naturally, in English. But for most children, English is only the third language (after their local language and Swahili, Kenya's language), and they speak it very poorly. Textbooks in English were never going to be very useful for the majority of children.[35] This experience has been repeated in many places with other inputs (from flip charts to improved teacher ratios). As long as they're not accompanied by a change in pedagogy or in incentives, new inputs don't help very much.

It should now be clear why private schools do not do better at educating the average child—their entire point is to prepare the best-performing children for some difficult public exam that is the stepping-stone toward greater things, which requires powering ahead and covering a broad syllabus. The fact that most children are getting left behind is unfortunate, but inevitable. The school Abhijit went to in Calcutta had a more or less explicit policy of expelling the bottom of the class every year, so that by the time the graduation exam came around, it could claim a perfect pass record. Kenyan primary schools adopt the same strategy, at least starting in sixth grade. Because parents share these preferences, they have little reason to put pressure on the schools to behave otherwise. Parents, like everyone else, want schools to deliver what they understand to be an "elite" education to their child—despite the fact that they are in no position to monitor whether this is what is actually being delivered or give any thought to whether their children will benefit from it. For example, English-language instruction is particularly popular with parents in South Asia, but non-English-speaking parents cannot know whether the teachers can actually teach in English. The flipside of this is that parents have little interest in the summer camps and the evening classes—kids who need those classes are not going to win the lottery, so what is the point?

We can also see why Pratham's summer schools worked. The public-school teacher seems to know how to teach the weaker children and is even willing to put some effort into it during the summer, but during the regular school year this is not his job—or so he has been led to believe. Recently, also in Bihar, we evaluated a Pratham initiative to fully integrate remedial education programs into government schools, by

training the teachers to work with their materials and also by training volunteers to work as teacher's assistants in these classrooms. The result was striking. In those (randomly chosen) schools that had both the teacher training and the volunteers, the gains are substantial, mirroring all the Pratham results we saw above. Where there was just teacher training, on the other hand, essentially nothing changed. The same teachers who did so well during the summer camps completely failed to make a dent: The constraints imposed by the official pedagogy and the particular focus on covering the syllabus seem to be too much of a barrier. We cannot just blame the teachers for this. Under India's new Right to Education Act, finishing the curriculum is required by law.

At the broader, societal level, this pattern of beliefs and behavior means that most school systems are both unfair and wasteful. The children of the rich go to schools that not only teach more and teach better, but where they are treated with compassion and helped to reach their true potential. The poor end up in schools that make it very clear quite early that they are not wanted unless they show some exceptional gifts, and they are in effect expected to suffer in silence until they drop out.

This creates a huge waste of talent. Among all those people who drop out somewhere between primary school and college and those who never start school, many, perhaps most, are the victims of some misjudgment somewhere: Parents who give up too soon, teachers who never tried to teach them, the students' own diffidence. Some of these people almost surely had the potential to be professors of economics or captains of industry. Instead they became daily laborers or shopkeepers, or if they were lucky, they made it to some minor clerical position. The slots that they left vacant were grabbed, in all likelihood, by mediocre children of parents who could afford to offer their children every possible opportunity to make good.

Stories about great scientists, from Albert Einstein to the Indian math genius Ramanujam, both of whom did not make it through the educational system, are of course well-known. The story of the company Raman Boards suggests that this experience may not just be limited to a few extraordinary people. A Tamil engineer named V. Raman

started Raman Boards in Mysore in the late 1970s. The company made industrial-grade paper products such as the sheets of cardboard used in electrical transformers. One day, V. Raman found a young man, Rangaswami, outside the door of the factory, asking for a job. He was from a very poor family, he said, and he had some engineering education, but just a diploma, not a proper college degree. Compelled by his insistence that he could do good work, Raman gave him a quick intelligence test. Impressed by the results, he took the young man under his wing. When there was a problem, Rangaswami would be assigned the task, and working initially with Raman, but increasingly on his own, he would come up with a creative solution to it. Raman's firm was eventually bought up by the giant Swedish multinational, ABB—it is now the most efficient of the many plants that ABB runs the world over, including in Sweden. Rangaswami, the man who could not get an engineering degree, is the head of engineering. His colleague, Krishnachari, another of Raman's finds—an ex-carpenter with little formal education—is a key manager in the components division.

Aroon, Raman's son, who ran the company before it was sold, now runs a small R&D unit with a few people who were with him at Raman Boards. His core research team of four includes two people who never completed high school, and no qualified engineers. They are brilliant, he says, but at the beginning the problem was that they didn't have the confidence to speak up, so how could one know? It is only because it was a small firm, and yet one that did a lot of R&D, that they were discovered. And even then it took a lot of patient work to discover their capabilities and they needed constant encouragement.

This model is obviously not easy to replicate. The problem is that there are no straightforward ways to identify talent, unless one is willing to spend a lot of time doing what the education system should have been doing: giving people enough chances to show what they are good at. Yet Raman Boards is not the only firm that thinks there is a lot of undiscovered talent out there. Infosys, one of India's IT giants, has set up testing centers where people, including those without much formal qualification, can walk in and take a test that focuses on intelligence and analytical skills rather than textbook learning. Those who do well get to become trainees, and successful trainees get a job. This alter-

native route is a source of hope for those who fell through the gaping holes in the education system. When Infosys closed its testing centers during the global recession, it was front-page news in India.

A combination of unrealistic goals, unnecessarily pessimistic expectations, and the wrong incentives for teachers contributes to ensure that education systems in developing countries fail their two main tasks: giving everyone a sound basic set of skills, and identifying talent. Moreover, in some ways the job of delivering quality education is getting harder. The world over, education systems are under stress. Enrollment has gone up faster than resources, and with the growth in the high-tech sectors, there is a worldwide increase in the demand for the kind of people who used to become teachers. Now they are becoming programmers, computer systems managers, and bankers instead. This is going to be a particularly serious issue for finding good teachers at the secondary level and beyond.

Is there a way out, or is the problem simply too difficult?

REENGINEERING EDUCATION

The good news, and it is very good news indeed, is that all the evidence we have strongly suggests that making sure that every child learns the basics well in school is not only possible, it is in fact fairly easy, as long as one focuses on doing exactly that.

A remarkable social experiment from Israel shows how much schools can do. In 1991, 15,000 more or less indigent Ethiopian Jews, including many children, were airlifted out of Addis Ababa in a single day and dispersed into communities all over Israel. There, these children, whose parents had completed on average between one and two years of schooling, entered elementary schools with other Israeli children, both long-term settlers and recent immigrants from Russia, whose parents had had on average 11.5 years of schooling. The family backgrounds of the two groups could not have been more different. Years later, at the point when those who entered school in 1991 were about to graduate from high school, the differences had narrowed considerably. Sixty-five percent of the Ethiopian children had reached twelfth grade without grade repetition, compared to the only slightly

higher 74 percent among the Russian emigrants. It turns out that even the most severe disadvantage in terms of family background and early life conditions can largely be compensated for, at least in Israeli schools, where the right conditions are met.[36]

Successful experiments have given us a number of ideas on how to create these conditions. A first factor is a focus on basic skills, and a commitment to the idea that *every child* can master them as long as she, and her teacher, expends enough effort on it. This is the fundamental principle behind the Pratham program, but it is also an attitude that is encapsulated by the "no excuse" charter schools in the United States.[37] These schools, such as the Knowledge Is Power Program (KIPP) schools, the Harlem Children's Zone, and others, mainly cater to students from poor families (particularly black children), with a curriculum that focuses on the solid acquisition of basic skills and continuous measurements of what children actually know. Without such diagnosis, it is impossible to evaluate their progress.

These schools have been shown, in several studies based on comparing winners and losers of the admission lotteries, to be extremely effective and successful. A study of charter schools in Boston suggests that expanding fourfold the capacity of charter schools and keeping the demographic profile of students the same would have the potential to erase up to 40 percent of the citywide gap in math test scores between white and black children.[38] The mechanism at play is exactly what we see in Pratham's programs: Children who are completely lost in the regular school system (their test scores are way behind those of other children when they enter charter schools) are given a chance to catch up, and many take it.

A second piece of good news from Pratham's work is that it takes relatively little training to be an effective remedial teacher, at least in the lower grades. The volunteers who had such dramatic effects were mostly college students and other people with a week or ten days of training in pedagogy. Moreover, this extends beyond teaching only reading and basic arithmetic. The same program in Bihar that put volunteers in classrooms also had them teach the children who could read well to use their reading skills to learn—Pratham calls this Reading to Learn, the sequel to its more basic Learning to Read—and the learn-

ing gains were substantial. Charter schools mainly use young, enthusiastic teachers, and they are able to significantly help both primary-school and middle-school children.

Third, there are large potential gains to be had by reorganizing the curriculum and the classrooms to allow children to learn at their own pace, and in particular to make sure the children who are lagging behind can focus on the basics. Tracking children is a way to do that. In Kenya, the study mentioned earlier compared two models to assign first-grade students to two separate classes. In one model, children were randomly assigned to a classroom. In the other, they were split up based on what the children already knew. When students were assigned according to their initial level, so that the teachers could address the children's needs better, students at all levels of initial achievement did better. And the gains were persistent: At the end of third grade, students who had been tracked in first and second grades were still doing better than those who had not been tracked.[39] Alternatively, one could find other ways to tailor the teaching to the needs of individual students. One possibility is to make the boundaries between the grades more fluid, so that a child whose age puts him in fifth grade but who needs to take second-grade classes in some subjects can do so without additional stigma.

More generally, a lot could be done to change the unrealistic expectations that everyone has. A program in Madagascar that simply told parents about the average income gains from spending one more year in school *for children from backgrounds similar to theirs* had a sizable positive effect on test scores, and, in the case of parents who found out that they had underestimated the benefits of education, the gains were twice as large.[40] An earlier study in the Dominican Republic produced similar results with high school students.[41] Since it is essentially free to have teachers simply pass on information to parents, this is so far the cheapest known way to improve test scores, among all the interventions that have been evaluated.

It may also be a good idea to try to set more proximate goals for both children and teachers. That way everyone can stop focusing so much on that one elusive outcome at the end of many years. A program in Kenya that offered a $20 USD PPP scholarship for the next year to girls who scored in the top 15 percent on an exam not only got

the girls to do much better, but it also put pressure on the teachers to work harder (to help the girls), which meant that boys did better, too, even though there was no scholarship for them.[42] In the United States, rewarding children for achieving long-term goals (such as getting high grades) was not successful, but rewarding them for effort on reading proved extremely effective.[43]

Finally, given that good teachers are hard to find and information technology is getting better and cheaper by the day, it seems rational to use it more. The current view of the use of technology in teaching in the education community is, however, not particularly positive. But this is based mainly on experience from the rich countries, where the alternative to being taught by the computer is, to a large extent, being taught by a well-trained and motivated teacher. As we have seen, this is not always the case in poor countries. And in fact, the evidence from the developing world, though sparse, is quite positive. We did an evaluation of a computer-assisted learning program run in collaboration with Pratham in the government schools in Vadodara in the early 2000s. The program was simple. Pairs of third- and fourth-graders got to play a game on the computer. The game involved solving progressively more difficult math problems; success in solving them gave the winner a chance to shoot some garbage into outer space (this was a very politically correct game). Despite the fact that they only got to play for two hours a week, the gains from this program in terms of math scores were as large as those of some of the most successful education interventions that have been tried in various contexts over the years, and this was true across the board—the strongest children did better, and so did the weakest children. This highlights what is particularly good about the computer as a learning tool: Each child is able to set his or her own pace through the program.[44]

This message of scaling down schools' expectations, focusing on the core competencies, and using technology to complement, or if necessary substitute for, teachers, does not sit well with some education experts. Their reaction is perhaps understandable—we seem to be suggesting a two-tier education system—one for the children of the rich, who will no doubt get taught to the highest standards in expensive

private schools, and one for the rest. This objection is not entirely unwarranted but unfortunately, the division exists already, with the difference that the current system delivers essentially nothing to a very large fraction of children. If the curriculum were radically simplified, if the teacher's mission were squarely defined as making everyone master every bit of it, and if children were allowed to learn it at their own pace, by repeating if necessary, the vast majority of children would get something from the years they spend in school. Moreover, the gifted would actually get a chance to discover their own gifts. It is true that it would take some work to put them on the same footing as those who went to elite schools, but if they had learned to believe in themselves, they might have a chance, especially if there is a willingness in the system to help them get there.[45] Recognizing that schools have to serve the students they do have, rather than the ones they perhaps would like to have, may be the first step to having a school system that gives a chance to every child.

5

Pak Sudarno's Big Family

Sanjay Gandhi, the younger son of the Indian prime minister Indira Gandhi and her heir apparent until his death in a plane crash in 1981, was convinced that population control needed to be an essential part of India's development plan. It was the central theme of his many public appearances during the period called the Emergency (mid-1975 until early 1977), when democratic rights were temporarily suspended and Sanjay Gandhi, despite holding no official position, was quite openly running things. The family-planning program must be given "the utmost attention and importance," he said in a characteristically understated quote, "because all our industrial, economic, and agricultural progress would be of no use if the population continued to rise at the present rate."[1]

India had had a long history with family planning, starting in the mid-1960s. In 1971, the state of Kerala experimented with mobile sterilization services, the "sterilization camps" approach that was to be the cornerstone of Sanjay Gandhi's plan during the Emergency. Although most politicians before him had identified population control as an important issue, Sanjay Gandhi brought to the problem both an unprecedented level of enthusiasm and the ability (and willingness) to twist as many arms as necessary to implement his chosen policies. In

April 1976, the Indian Cabinet approved a formal statement of national population policy that called for a number of measures to encourage family planning, notably, large financial incentives for those who agreed to be sterilized (such as a month's wages or priority on a housing list), and more frighteningly, authorization for each state to develop compulsory sterilization laws (for, say, everyone with more than two children). Although only one state proposed such a law (and that law was never approved), states were explicitly pressured to set sterilization quotas and fulfill them, and all but three states "voluntarily" chose targets greater than what was proposed by the central government: The targets totaled 8.6 million sterilizations for 1976–1977.

Once laid out, the quotas were not taken lightly. The chief of the Uttar Pradesh bureaucracy wrote by telegraph to his principal field subordinates: "Inform everybody that failure to achieve monthly targets will not only result in the stoppage of salaries but also suspension and severest penalties. Galvanise entire administrative machinery forthwith repeat forthwith and continue to report daily progress by crash wireless to me and secretary to Chief Minister." Every government employee, down to the village level, and not excluding railway inspectors and school teachers, was supposed to know the local target. Parents of schoolchildren were visited by teachers, who told them that in the future, their children may be denied enrollment in school if they did not agree to get sterilized. People traveling by train without a ticket—a widely accepted practice among the poor until then—were handed heavy fines unless they chose sterilization. Not surprisingly, the pressure occasionally went much further. In Uttawar, a Muslim village near the capital city of Delhi, all male villagers were rounded up one night by the police, sent to the police stations on bogus charges, and sent from there to be sterilized.

The policy appears to have achieved its immediate target, although the incentives probably also led to some overreporting in the number of actual sterilizations. In 1976–1977, 8.25 million people were reportedly sterilized, 6.5 million of them during just the period July–December 1976. By the end of 1976, in total, 21 percent of Indian couples were sterilized. But the violations of civil liberties that were an integral part of the implementation of the program were widely re-

sented, and when in 1977 India finally held elections, discussions of the sterilization policy were a key part of the debate, as captured most memorably by the slogan "*Indira hatao, indiri bachao* (Get rid of Indira and save your penis)." It is widely believed that Indira Gandhi's defeat in the 1977 elections was in part driven by popular hatred for this program. The new government immediately reversed the policy.

In one of those ironic twists in which historians delight, it is not inconceivable that in the longer term, Sanjay Gandhi actually contributed to the faster growth of India's population. Tainted by the emergency, family-planning policies in India retreated into the shadows and in the shadows they have remained—some states, such as Rajasthan, do continue to promote sterilization on a voluntary basis, but no one except the health bureaucracy seems to have any interest in it. In the meantime, however, generalized suspicion of the motivations of the state seems to be one of the most durable residues of the Emergency; for example, one still routinely hears of people in slums and villages refusing pulse polio drops because they believe it is a way to secretly sterilize children.

This particular episode and China's draconian one-child policy are the most well-known examples of severely enforced population control measures, but most developing countries have some form of population policy. In an article published in *Science* in 1994, John Bongaarts, from the Population Council, estimated that in 1990, 85 percent of the population of the developing world lived in countries where the government had the explicit view that their population was too large and needed to be controlled through family planning.[2]

There are certainly many reasons for the world at large to be worried about population growth today. Jeffrey Sachs talks about them in his book *Common Wealth*.[3] The most obvious is its potential impact on the environment. Population growth contributes to the growing carbon dioxide emissions and hence to global warming. Drinking water is getting scarcer by the day in some parts of the world, in part directly because there are more people drinking and in part because having more people means growing more food and therefore using more water for irrigation (70 percent of fresh water is accessed for irrigation). The World Health Organization estimates that one-fifth of the world's

population lives in areas where fresh water is scarce.[4] These are of course vitally important issues, and individual families deciding how many children to have probably do not fully take them into account, which is precisely why a population policy might be needed. The problem is that it is impossible to develop a reasonable population policy without understanding why some people have so many children: Are they unable to control their own fertility (due to lack of access to contraception, for example), or is it a choice? And what are the reasons for those choices?

WHAT IS WRONG WITH LARGE FAMILIES?

Richer countries have lower population growth. For example, a country like Ethiopia, where the total fertility rate is 6.12 children per woman, is fifty-one times poorer than the United States, where the total fertility rate is 2.05.

This strong relationship has convinced many, including academics and policy makers, of the validity of an old argument first popularized by the Reverend Thomas Malthus, a professor of history and political economy at the East India Company College, near London, at the turn of the eighteenth century. Malthus believed that the resources countries have are more or less fixed (his favorite example was land), and he therefore thought that population growth was bound to make them poorer.[5] By this logic, the Black Death, believed to have killed half of Britain's population between 1348 and 1377, should get credit for the high-wage years that followed. Alwyn Young, an economist at the London School of Economics, recently reinstated this argument in the context of the current HIV/AIDS epidemic in Africa. In an article entitled "The Gift of the Dying," he argued that the epidemic would make future generations of Africans better off by reducing fertility.[6] This reduction of fertility occurs both directly, through the reluctance to engage in unprotected sex, and indirectly, because the resulting labor scarcity makes it more attractive for women to work rather than have babies. Young calculated that in South Africa in the coming decades, the "boon" of a reduced population would be large enough to outweigh the fact that many of the AIDS orphans would not get a proper

education; South Africa could be 5.6 percent richer in perpetuity as a direct consequence of HIV. He concluded by observing, no doubt for the benefit of his more squeamish readers, "One cannot endlessly lament the scourge of high population growth in the developing world and then conclude that a reversal of such processes is an equal economic disaster."

Young's article generated a heated controversy that centered on whether the HIV/AIDS epidemic indeed causes a decline in fertility. Careful follow-up[7] has since refuted this claim. However, people were mostly willing to concede his other premise—that a cut in fertility would make everyone richer.

Yet this is less obvious than it sounds. After all, there are many times more people on the planet today than when Malthus first formulated his hypothesis and most of us are richer than Malthus's contemporaries. Technological progress, which did not figure in Malthus's theories, has a way of making resources appear from nowhere; when there are more people around, there are more people looking for new ideas, and so perhaps technological breakthroughs are more likely. Indeed, for most of human history (starting in 1 million BC), regions or countries that had more people were growing *faster* than the rest.[8]

The case is therefore unlikely to be settled on purely theoretical grounds. And the fact that today countries with higher fertility rates are poorer doesn't tell us that they are poorer because of high fertility: It could instead be that they have high fertility because they are poor, or some third factor could cause both high fertility and poverty. Even the "fact" that periods of rapid economic growth often coincide with sharp declines in fertility, as in Korea and Brazil in the 1960s, is ambiguous at best. Did families start having fewer children when growth accelerated, perhaps because they had less time to take care of them? Or did the reduction in fertility free up resources for other investments?

As we have had to do many times already, we need to shift perspective, leave the large question aside, and focus on the lives and choices of poor people—if we want to have any hope of making progress on this issue. One way to start is by looking at what happens within the family: Are large families poorer because they are large? Are they less able to invest in the education and health of their children?

One of Sanjay Gandhi's favorite slogans was "A small family is a happy family." Accompanied by a cartoon image of a beaming couple with their two plump children, it was one of the most universal sights in late 1970s India. This could have been the illustration of an influential argument offered by Gary Becker, a Nobel Prize–winner in economics. Families, Becker argued, face what he called a "quality-quantity trade-off." That is, when there are more children, each of them will be of lower "quality" because the parents will devote fewer resources to feeding and schooling each of them properly.[9] This would be particularly true if the parents believed, rightly or wrongly, that it is worth investing more in the most "gifted" of their children, which, as we have already discussed, is what happens in the S-shaped world. Some children could then end up being entirely denied their life chances. If children born into large families are less likely to receive proper education, nutrition, and health care (what economists call investment in human capital), and if poor families are more likely to be large (say, because they cannot afford contraception), this creates a mechanism for the intergenerational transmission of poverty, in which poor parents beget (many) poor children. Such a poverty trap could potentially provide a rationale for a population policy, an argument that Jeffrey Sachs makes in *Common Wealth*.[10] But is it actually true? Do children who grow up in larger families have obvious disadvantages? In our eighteen-country data set, children born into large families do tend to have less education, though this is not true everywhere—rural Indonesia,[11] Côte d'Ivoire, and Ghana[12] are among the exceptions. However, even where it is true, there is no presumption that it is *because* the children have many siblings that they are poor and less educated. It could just be that poor families who choose to have many children also do not value education as much.

To test Becker's model and find out whether an increase in family size leads to reduced investment in children's human capital, researchers have tried to focus on instances where the increase was in part beyond the control of the family. Their results are surprising: In such cases, they found no evidence that children born in smaller families are really more educated.

One example of a situation where a family ends up with more children than it expected, given that most of the world's poor do not use

fertility-enhancing therapies, is the birth of twins: If the family was planning to have two children, for example, but twins are born at the second birth, the first child then has one more sibling than he or she would otherwise have had. The sex composition of children is another factor. Families often want to have both a boy and a girl. This means that a couple whose second child was of the same gender as their first is more likely to plan for a third than a family that already has a boy and a girl.[13] In many developing countries, parents are also more likely to have an additional child if they have not yet had a boy. Compare a girl who is a first child, and has one female sibling, with one who has a male younger sibling: The former is more likely to grow up with two or more siblings than the latter, for the purely accidental reason (at least till the advent of child sex-selection technologies) that she had a younger sister rather than a younger brother. A study in Israel that focused on these sources of variation in family size found, surprisingly, that large family size appears to have had no adverse effects on the education of the children, even among Israeli Arabs, who are mostly very poor.[14]

Nancy Qian found an even more provocative result when she looked at the effect of the one-child policy in China. In some areas, the policy was relaxed to allow a family whose first child was a girl to have a second child. She found that girls who, because of this policy, got a sibling they would not otherwise have had received *more* education, not less,[15] in apparent defiance of Becker's theorem.

Another piece of evidence comes from Matlab, Bangladesh. This area was the setting for one of the most impressive experiments in voluntary family planning in the world. In 1977, a sample of half of 141 villages was selected to receive an intensive family-planning outreach program called the Family Planning and Maternal and Child Health Program (FPMCH). Every two weeks, a trained nurse brought family-planning services to the homes of all married women of childbearing age who were willing to receive her. She also offered help with prenatal care and immunizations. Perhaps not surprisingly, the program led to a sharp reduction in the number of children. By 1996, women in the program areas between the ages of thirty and fifty-five had about 1.2 fewer children than those in the areas that didn't get the program.

This change was accompanied by a drop in child mortality by one-fourth, but since the program also directly intervened to improve child health, there is no reason to attribute the increase in child survival to the change in fertility. Yet despite the facts that fertility decreased and lots more money was spent on making children healthier, by 1996, there was no significant difference in the height, weight, school enrollment, or years of education achieved for either boys or girls. Again, the quality-quantity relationship seems to be absent.[16]

Of course, these three studies alone may not be the last word, and there is certainly a need for more research, but for now, our reading of the evidence, contrary to what Sachs argues in *Common Wealth*, is that there is no smoking gun to prove that larger families are bad for children. As such, it is hard to justify top-down family planning as a means of protecting children from having to grow up in large families.

That family size does not adversely affect children seems counterintuitive, however: If the same resources have to be shared among more people, some of them at least should end up with less. If children do not suffer, who does? One possible answer is the mother.

The Profamilia program in Colombia suggests that this is definitely something to worry about. Launched by a young obstetrician named Fernando Tamayo in 1965, Profamilia was the major provider of contraception in Colombia over the next few decades and is one of the longest-standing family-planning programs in the world. By 1986, 53 percent of Colombian women of reproductive age were using contraceptives, mainly obtained through Profamilia. And women who had access to family planning as teenagers through this program had more schooling and were 7 percent more likely to work in the formal sector than those who did not.[17]

Along similar lines, the Bangladeshi women who benefited from the program in Matlab were heavier and taller than those in the comparison group and also earned more. The availability of contraception gives women more control over their reproductive lives—they can decide not just how many babies to have but also when to have them. And there is clear evidence that getting pregnant too early in life is very bad for the health of the mother.[18] Moreover, early pregnancy, or even get-

ting married, often results in dropping out of school.[19] But to locate the case for family planning in society's desire to protect the mother raises an obvious question: If getting pregnant at the wrong time is not in her interest, why does it happen? More generally, how do families make fertility decisions, and how much control do women have over these decisions?

DO THE POOR CONTROL THEIR FERTILITY DECISIONS?

One reason the poor may not be able to control their fertility is that they may not have access to modern contraception methods. According to the official UN report on progress toward the Millennium Development Goals, filling "unmet demand" for modern contraceptives could "result in a 27 percent drop in maternal deaths each year by reducing the annual number of unintended pregnancies from 75 million to 22 million."[20] Poor and uneducated women are much less likely to use contraception than richer and more educated women. Moreover, in the last decade, there has been no increase in the use of modern contraception among poor women.

Yet, low *usage* is not necessarily a sign of *lack of access.* The same kinds of demand-supply wars that have animated the field of education have their equivalents in the family-planning arena and, perhaps not surprisingly, the supply and demand wallahs are often the same people. The supply wallahs (such as Jeffrey Sachs) emphasize the importance of access to contraception, noting that people who use modern contraceptive methods have much lower fertility rates; the demand wallahs retort that this relationship just reflects the fact that those who want to reduce fertility mostly find their way to the right kind of contraception without any outside help, so just making contraception available will not do very much.

To find out whether it was the case, Donna Gibbons, Mark Pitt, and Mark Rosenzweig painstakingly matched the data on the number of family-planning clinics available at three points in time (1976, 1980, and 1986) in each of several thousand Indonesian subdistricts to village-level survey data on fertility.[21] Unsurprisingly, they found that regions that had more clinics had lower fertility. However, they also

found that the decline in fertility over time was unrelated to the increase in the number of clinics. They concluded that family-planning facilities were provided where people wanted them, but that they had no direct effect on fertility. Demand wallahs, 1; supply wallahs, 0.

The Matlab program has long been the poster child for the supply wallahs. Here at least, they argue, there is incontrovertible evidence that the availability of contraceptives makes a difference. As we saw, women age thirty to fifty-five in 1996 had on average 1.2 fewer children in treatment areas than those in control areas. But the program in Matlab was doing much more than just making contraceptives available. One of its key components was the biweekly visit by a female health worker to households where women were in purdah and therefore limited in their mobility, bringing the discussion of contraception to places where it used to be taboo. (This also made the program expensive—Lant Pritchett, then a World Bank economist, estimated that the Matlab program cost thirty-five times more per fertile woman and per year than the typical family-planning program in Asia.)[22] Thus, it is plausible that the program directly altered the households' desired number of children, rather than just giving them some tools they could use to control their fertility. Moreover, since about 1991, fertility has stopped falling in the program areas, and the difference between program areas and other control areas has started to narrow. In 1998, the last year for which we have data, the total fertility rate was 3.0 in the program areas, 3.6 in the control areas, and 3.3 in the rest of Bangladesh.[23] The Matlab program may have simply accelerated a trend toward fertility reduction that was happening in the rest of the country. So at best, this one seems to be a draw.

The study of the Colombian Profamilia program also concludes that the program had very little effect on overall fertility. Access to Profamilia led women to have only about 5 percent fewer children in their lifetimes, which is less than one-tenth of the total fertility decline since the 1960s. Demand wallahs, 2; supply wallahs, 0.

Thus, the data seem to squarely hand victory to the demand wallahs: Contraceptive access may make people happy by giving them a much more convenient way to control their fertility than the available alternative. But it appears to do, in itself, little to reduce fertility.

Sex, School Uniforms, and Sugar Daddies

What better access to contraceptives can do, however, is help teenagers postpone pregnancies. The Profamilia program did that in Colombia and helped women get better jobs down the line. Unfortunately, in many countries, teenagers are barred from accessing the family-planning services unless their parents give official consent. Teenagers may be the most likely to have an unmet need for contraception, mainly because many countries do not recognize the legitimacy of their sexual desires or assume that they have so little control that they would not be able to use contraception properly. The result is that teenage pregnancy rates are extremely high in many developing countries, particularly in sub-Saharan Africa and in Latin America. According to WHO, the rate of teen pregnancy is above 10 percent in Côte d'Ivoire, Congo, and Zambia; and Mexico, Panama, Bolivia, and Guatemala have rates between 8.2 and 9.2 births per 100 adolescent women (in the United States, which has one of the highest teen pregnancy rates in the developed world, there are 4.5 births per 100 adolescent women).[24] Further, the little that seems to be done about this issue or the related issue of the spread of sexually transmitted diseases (including HIV/AIDs) tends to completely miss the mark.

Esther found a clear example of the consequences of this kind of misguided effort in Kenya. With Pascaline Dupas and Michael Kremer, she followed schoolgirls—initially ages twelve to fourteen, who had never been pregnant.[25] One, three, and five years down the road, average pregnancy rates among them were 5 percent, 14 percent, and 30 percent, respectively. Early pregnancies are not only undesirable in and of themselves, but they are also a marker for risky sex, which in Kenya means a higher risk of contracting HIV/AIDS. The official strategy to address this problem in Kenya, the result of a delicate balancing act negotiated among civic groups, various churches, international organizations, and the government, mostly emphasizes that sexual abstinence is the only foolproof solution. The standard message spells out a clear hierarchy of strategies: Abstain, Be faithful, use a Condom . . . or you Die (or in other words, ABCD). In schools, children are taught to avoid sex until marriage, and condoms are not discussed. For many years, this

trend was encouraged by the U.S. government, which focused its AIDS prevention money on abstinence-only programs.[26]

This strategy presumes that adolescents are not responsible or smart enough to weigh the costs and benefits of sexual activity and condom use. If this were indeed the case, scaring them away from sex altogether (or at least from sex outside marriage) would be the only way to protect them. But several simultaneous experiments that Esther, Pascaline Dupas, and Michael Kremer conducted in Kenya suggest that, quite to the contrary, adolescents make carefully calculated, if not fully informed, choices about whom to have sex with and under what conditions.

In the first study, the ABCD strategy was evaluated by arranging for teachers in 170 randomly chosen schools to be trained in teaching the ABCD curriculum. Not surprisingly, this training increased the time spent on AIDS education in schools, but there were no changes in reported sexual behavior or even in knowledge about AIDS. In addition, when measured one, three, and five years after the intervention, pregnancy rates among adolescents were the same in schools where teachers were trained and where they were not, suggesting no change in the extent of risky sex.

The effects of the two other strategies that were tried in the same schools could not have been more different. The second strategy just involved telling the girls something they did not know: the fact that older men are more likely to be infected with HIV than younger ones. A striking feature of HIV is that women from the ages of fifteen to nineteen are five times more likely to be infected than young men in the same cohort. This seems to be because young women have sex with older men, who have comparably high infection rates. The "sugar daddies" program simply informed students about what kind of people are more likely to be infected. Its effect was to sharply cut down sex with older men (the "sugar daddies") but, also interestingly, to promote protected sex with boys their own age. After a year, the pregnancy rates were 5.5 percent in schools that had not received the program and 3.7 percent in schools that had received it. This reduction was mainly attributable to a reduction by two-thirds in pregnancies where an older male partner was involved.[27]

The third program just made it easier for girls to remain in school by paying for a school uniform. Teenage pregnancy rates in the schools where uniforms were offered fell from 14 percent to 11 percent after a year. To put it slightly differently, for every three girls who stayed in school because of the free uniform, two delayed their first pregnancy. Intriguingly, this effect was entirely concentrated in the schools where the teachers had not been trained in the new sex-education curriculum. In schools that had both the HIV/AIDS and the uniforms programs, girls were no less likely to become pregnant than those in the schools that had nothing. The HIV/AIDS education curriculum, instead of reducing sexual activity among adolescents, actually *undid* the positive effect of the uniform distribution.

Putting these different results together, a coherent story starts to emerge. Girls in Kenya know perfectly well that unprotected sex leads to pregnancy. But if they think that the prospective father will feel obliged to take care of them once they give birth to his child, getting pregnant may not be such a bad thing after all. In fact, for the girls who cannot afford a school uniform and therefore cannot stay in school, having a child and starting a family of her own may be a relatively attractive option, compared to just staying at home and becoming the general "Hey, you" for the whole family, the usual outcome for unmarried out-of-school teenage girls. This makes older men more attractive partners than young boys who cannot yet afford to get married (at least when the girls don't know that they are more likely to have HIV). Uniforms reduce fertility by giving girls the ability to stay in school, and thus a reason not to be pregnant. But the sex-education program, because it discourages extramarital sex and promotes marriage, focuses the girls on finding a husband (who more or less has to be a sugar daddy), undoing the effect of the uniforms.

One thing is relatively clear: For the most part, poor people, even adolescent girls, make conscious choices about their own fertility and sexuality and find ways—though perhaps not pleasant ways—to control it. If young women get pregnant even though it is extremely costly for them, it must reflect someone's active decision.

Whose Choice?

One issue that immediately arises when we think about fertility choice, however, is whose choice? Fertility decisions are made by a couple, but women end up paying most of the physical costs of bearing children. Not surprisingly, their preferences for fertility end up being quite different from those of men. In surveys on desired family size in which men and women are separately interviewed, men usually report a larger ideal family size and consistently a lower demand for contraception than their wives. Given the potential for disagreement, how much say a woman has within the household will clearly matter. It is plausible, for example, that a woman who is much younger than her husband or much less educated (both consequences of early marriage) will find it harder to stand up to her husband. But it also depends on whether she can find a job, her freedom to divorce, and her survival options in the case of divorce. These contingencies, in turn, depend on the legal, social, political, and economic environment she and her husband inhabit, which can be affected by public policy. In Peru, for example, when former squatters were handed out property rights, fertility declined in households that got a title (compared to those that got nothing), but only if the woman's name was included on the title along with that of the man.[28] One likely explanation is that with her name on a property title, the woman acquired more bargaining power in the family and was therefore able to weigh more heavily in the decision on family size.

The conflict between husbands and wives also implies that whereas the availability of contraceptives per se may not do very much to reduce fertility, small changes in the *way* in which they are made available can potentially have larger effects. Nava Ashraf and Erica Field provided 836 married women in Lusaka, Zambia, with a voucher guaranteeing free and immediate access to a range of modern contraceptives through a private appointment with a family-planning nurse. Some women received the voucher in private. Some received the voucher in the presence of their husbands. Ashraf and Field found that this made a huge difference: Compared to cases where husbands were involved, women who were seen alone were 23 percent more likely to visit a

family-planning nurse, 38 percent more likely to ask for a relatively concealable form of contraception (injectable contraceptives or contraceptive implants), and 57 percent less likely to report an unwanted birth nine to fourteen months later.[29] One of the reasons the Matlab program changed fertility choices more than other family-planning programs is probably also that by visiting the women in their houses, presumably when the husbands were away, the female health worker may have enabled some of them to adopt family planning without his knowledge. In contrast, women whose mobility was restricted by the custom of purdah (which forbids a woman to leave the house without her husband) would have had to be accompanied by their husbands to go receive the services at a central location, and this might have changed their decision.

A possible explanation for the relatively large effects of the Matlab program, especially early on, is that it accelerated social change. One reason the fertility transition takes time is that people other than the wife and husband have a say about it. Fertility is in part a social and a religious norm, and deviations from it do get punished (by ostracism, ridicule, or religious sanctions). Therefore, it matters what the community deems to be appropriate behavior. In the treatment areas in Matlab, this change was faster than elsewhere—the community health worker, who tended to be a relatively well-educated and assertive woman, was both the embodiment of the new norm and the carrier of news about the shifting norms in the rest of the world.

Kaivan Munshi studied the role of social norms in the contraception decisions in Matlab. He cites a young woman who described how her peer group discussed "how many children we would have, what method would be suitable for us . . . whether we should adopt family planning or not, all these topics. . . . We used to know from people that they used (contraceptives). If a couple takes any such method, the news somehow spreads."[30]

Munshi found that in Matlab villages where there was a community health worker, women were more likely to adopt contraceptives if village members of their own religious group had had higher contraceptive use over the previous six months. Even though both Hindus and Muslims within the village had access to the same health worker and

had exactly the same access to contraceptives, Hindus adopted contraceptive use when other Hindus were doing so and Muslims adopted contraceptives when other Muslims did. The contraceptive adoption by Hindus had no effect on the adoption by their Muslim neighbors, and vice versa. This pattern, Munshi concludes, must mean that the women were progressively learning about what was acceptable behavior within their communities.

Negotiating shifts in the social norm within traditional societies can be a very complex business. It is not easy, for example, to ask certain questions (Is contraception against religion? Will it make me permanently barren? Where can I find it?) because the act of asking itself reveals your inclinations. As a result, people often pick up things from the most unlikely sources. In Brazil, a Catholic country, the state has carefully stayed away from encouraging family planning. However, television is very popular, in particular the telenovelas (soap operas) that air on prime time on one of the main channels, Rede Globo. From the 1970s through the 1990s, access to the Rede Globo channel expanded dramatically, and with it the viewership of the telenovelas. At the telenovelas' peak popularity in the 1980s, the characters in the soaps tended to be very different from the average Brazilian in terms of both class and social attitudes: Whereas the average Brazilian woman had almost six children in 1970, in the soap operas most female characters under the age of fifty had none, and the rest had one. Right after soaps became available in an area, the number of births would drop sharply; moreover, women who had children in those areas named their children after the main characters in the soap.[31] The novelas ended up projecting a very different vision of the good life than the one that Brazilians were used to, with historic consequences. This was not entirely accidental—in Brazil's straitlaced society, the soap opera ended up being the outlet of choice for many creative and progressive artists.

At the risk of sounding, perhaps one time too many, like the "two-handed economists" who irritated Harry Truman, the answer to the question "Do the poor control their family decisions?" thus seems to proceed in two steps. At the most obvious level, they do: Their fertility decisions are the product of a choice, and even the lack of availability of contraception does not seem to be a big constraint. At the same

time, what leads them to make these choices may be in part factors that are outside their immediate control: Women, in particular, may be pressured by their husbands, their mothers-in-law, or social norms to bear more children than they would like. This suggests a very different set of policies than those adopted by Sanjay Gandhi, or by the well-intentioned international organizations today: Making contraception available will not be sufficient. Affecting social norms may be more difficult, although the example of TV in Brazil shows it can be done. But the social norms may also reflect economic interests in a society. To what extent do the poor want many children simply because it is a sound economic investment?

CHILDREN AS FINANCIAL INSTRUMENTS

For many parents, children are their economic futures: an insurance policy, a savings product, and some lottery tickets, all rolled into a convenient pint-size package.

Pak Sudarno, the scrap collector from the Cica Das slum in Indonesia, who was sending his youngest child to secondary school because that seemed to him to be a worthwhile gamble, had nine children and a large number of grandchildren. When we asked him whether he was happy that he had had so many children, he said "absolutely." He explained that with nine children, he could be sure that at least a couple of them would turn out fine and take care of him when he was old. Clearly, having more children also increases the risk that something will go wrong with at least one of them. In fact, one of Pak Sudarno's nine children suffered from severe depression and had disappeared three years before. He was sad about that, but at least he had the other eight to console him.

Many parents in rich countries don't need to think in quite these terms because they have other ways to deal with their waning years—there is Social Security, there are mutual funds and retirement plans, and there is health insurance, public or private. In the coming chapters, we will discuss at some length why many of these options are not really available to someone like Pak Sudarno. For the time being, we will just observe that for most of the world's poor, the idea that children (and

family beyond children—siblings, cousins, and so forth) will take care of parents in old age and during times of need is the most natural thing. In China, for example, more than half the elderly lived with their children in 2008, and that fraction increases to 70 percent for those who had seven or eight children (this was before family planning, when having many children was actually politically favored).[32] Elderly parents also received regular financial help from their children, particularly boys.

If children are in part a way to save for the distant future, we would expect that when fertility drops, financial savings go up. China, with its government-enforced restriction on family size, provides us with the starkest example of this phenomenon. After encouraging high fertility rates immediately after the revolution, China started encouraging family planning in 1972, then introduced the one-child policy in 1978. Abhijit, with two Chinese-born coauthors, Nancy Qian (an only child born in the one-child policy era) and Xin Meng (one of four children born before it began) examined what happened to savings rates after the introduction of family planning.[33] Households that had their first child after 1972 have one less child on average than those who had that child before 1972, and their savings rates are approximately 10 percentage points higher. These results imply that up to one-third of the phenomenal increase in savings rates in China in the past three decades (the household savings ratio increased from 5 percent in 1978 to 34 percent in 1994) can potentially be explained by the reduction in fertility induced by family-planning policies; the effect was particularly strong for households that had a daughter rather than a son at first birth, consistent with the view that sons are supposed to be the ones who take care of parents.

This is a huge effect, but of course the Chinese "experiment" is somewhat extreme: It was a large, sudden, and involuntary reduction in family size. Something similar happened in the Matlab area in Bangladesh, however. By 1996, families in villages where contraception had been made available had significantly more assets of all kinds (jewelry, land, animals, house improvements) than families in the comparable villages where it was not available. On average, a household in the treatment area had 55,000 takas' more worth in assets ($3,600 USD

PPP, more than twice the GDP per capita of Bangladesh) than those in control areas. There is also a link between fertility and the amount of money given to parents by their children: Those in the treatment areas received on average 2,146 takas less in transfers from their children every year.[34]

The very strong substitution between family size and savings may help us explain the surprising finding that having fewer children does not translate into healthier or better-educated children: If parents who have fewer children expect lower money transfers in the future, they also need to save more in anticipation, and this cuts into the funds they have available for investing in the children they have. Indeed, if investing in children tends to have a much higher return than investing in financial assets (after all, feeding a child is not that expensive), families may actually be poorer in a lifetime sense when they have fewer children.

The same logic also tells us that if parents don't expect their daughters to be nearly as useful in taking care of them as their sons—say, because they have to pay a dowry to get their daughters married or because women are expected to get married and once married, their husbands have economic control over them—parents will be less invested in the lives of their daughters. Families not only choose an optimal number of children, they also choose the gender composition. We typically think of our children's gender as something we don't get to decide, but that turns out to be untrue: Sex-selective abortions, which are now widely available and extremely cheap, allow parents to choose whether they would rather abort a female fetus. As the stickers pasted on the dividers in Delhi's main road advertising (illegal) sex-determination services put it: "Spend 500 rupees now and save 50,000 rupees later" (on dowries). And even before sex-selective abortion was an option, in environments where a whole range of childhood diseases can easily turn fatal if not properly dealt with, there was always neglect, deliberate or otherwise, which can be an effective way to get rid of any unwanted children.

Even if their children don't die before or after birth, when parents prefer boys, they may have children until they have the number of boys they want. This means that girls will tend to grow up in larger families,

and many of the girls will be born in a family that really wanted boys. In India, girl babies stop getting breast-fed earlier than boys, which means that they start drinking water earlier and have accelerated exposure to waterborne life-threatening diseases like diarrhea.[35] This is mostly the unintended consequence of the fact that breast-feeding acts as a contraceptive. After the birth of a girl (particularly if she has no brothers), parents are more likely to want to stop breast-feeding earlier in order to increase the wife's chances of getting pregnant again.

Whatever the exact mechanics of discrimination against baby girls (or potential baby girls), the fact remains that the world has many fewer girls than human biology would predict. In the 1980s, in a now classic article in the *New York Review of Books*, Amartya Sen calculated that there were 100 million "missing women" in the world.[36] This was before sex-selective abortion was available—and things have only gotten worse since. In some regions in China, there are today 124 boys for every 100 girls. Between 1991 and 2001 (the date of the latest census in India), the number of boys under seven per 100 girls the same age increased from 105.8 to 107.8 for India as a whole. In Punjab, Haryana, and Gujarat, three of India's richest states but also three of the states where discrimination against girls is believed to be the greatest, there were respectively 126.1, 122.0, and 113.8 boys per 100 girls in 2001.[37] Even according to self-reports, which almost certainly underestimate the phenomenon, the number of abortions is particularly high in those states: In families with two daughters, 6.6 percent of pregnancies ended in an induced abortion and 7.2 percent in a "spontaneous" abortion.

But this is less of a problem where girls are more valuable either in the market for marriage or in the labor market. In India, girls are not supposed to get married within their own villages. Typically, there are designated areas, not too close to the village but not too far away, into which a majority of the girls will marry and move. As a result, it is possible to look at what happens when there is economic growth in this marriage "catchment" area, which presumably makes it easier to find a prosperous family to marry a daughter into. Andrew Foster and Mark Rosenzweig studied this and found that the mortality differential between boys and girls decreases when a girl's marriage prospects are brighter; in contrast, economic growth *in the village,* which increases

the value of investing in boys (because they stay home), leads to a widening of the mortality gap between boys and girls.[38]

Perhaps the most striking illustration of how a household's treatment of girls responds to the relative values of boys and girls comes from China, which has one of the largest imbalances between boys and girls. During the Maoist era, centrally planned agricultural production targets focused on staple crops. In the early reform era (1978–1980), households were allowed to produce cash crops, including tea and orchard fruits. Women tend to be more useful than men in the production of tea, which needs to be plucked with delicate fingers. In contrast, men are more useful than women in the production of orchard fruits, which involves lifting heavy loads. Nancy Qian showed that when we compare children born in the post- and pre-reform periods, the number of girls in the tea plantation regions (hilly and rainy) increased, but it went down in the regions that were more suitable for orchards.[39] In regions that were not particularly suitable to either tea or orchards, where agricultural income increased across the board without favoring either gender, the gender composition of children did not change.

What all of this underscores is the violence, active and passive, subsumed within the functioning of the traditional family. This was, until fairly recently, ignored by most (though not all) economists, who preferred to leave that black box closed. Yet most societies rely on the goodwill of the parents to make sure that children get fed, schooled, socialized, and taken care of more generally. Given that these are the same parents who contrive to let their little girls die, how much faith should we place in their ability to get this done effectively?

THE FAMILY

For the sake of their models, economists often ignore the inconvenient fact that the family is not the same as just one person. We treat the family as one "unit," assuming that the family makes decisions as if it were just one individual. The paterfamilias, the head of the dynasty, decides on behalf of his spouse and his children what the family consumes, who gets educated and for how long, who gets what kind of bequest,

and so on. He may be altruistic, but he is clearly omnipotent. But as anybody who has been part of a family knows, this isn't quite how families work. This simplification is misleading, and there are important policy consequences from ignoring the complicated dynamics within the family. We already saw, for example, that giving women access to a formal property title is important for fertility choices, not because it changes her view on how many children she wants but because it makes her views count more.

The realization that the simplest model was missing important aspects of how the family works led to a reassessment in the 1980s and 1990s:[40] Family decisionmaking came to be seen as the result of a bargaining process among family members (or at least between the two parents). Both partners negotiate over what to buy, where to go on vacation, who should work how many hours, and how many children to have, but do so in a way that serves both of their interests as well as possible. In other words, even if they disagree on how the money should be spent, if one of them can be made happier without hurting the other one's well-being, they would make sure it is done. This view of the family is usually referred to as the "efficient household" model. It recognizes that there is something special about the family—its members, after all, did not meet just yesterday and are presumably tied together for the long term. It should therefore be possible (and in their interest) to negotiate over all their decisions to make sure that they do as well as they can, as a family. For example, if the family runs a small enterprise (be it a farm or a small business), it should always try to make as much money from it as possible, and only afterward find a way to split up the gains among its members.

Christopher Udry tested this prediction in rural Burkina Faso, where each household member (the husband and the wife, or wives) works on a separate plot.[41] In an efficient household, all inputs (family labor, fertilizer, and so forth) should be allocated to the various plots in a way that maximizes total family earnings. The data squarely rejected this view: Instead, plots farmed by women were allocated systematically less fertilizer, less male labor, and less child labor than plots farmed by men. As a result, these households systematically produced less than they could have. Using a little bit of fertilizer on a plot increases its

productivity a great deal, but increasing the amount beyond that initial level does not do very much—it is more effective to use a little bit of fertilizer on all the plots than a lot of fertilizer on just one plot. But most of the fertilizer in the Burkina Faso households was used on the husband's plot: By reallocating some of the fertilizer plus a bit of labor to the wives' plots, the family could increase its production by 6 percent without spending an extra penny. Families were literally throwing money away because they could not agree on the best way to use the resources they had.

The reason they were doing so also seems clear: Even though they are part of the same family, what the husband grows on his own plot seems to determine what he gets to consume, and likewise for his wife.[42] In Côte d'Ivoire, women and men traditionally grow different crops. Men grow coffee and cocoa, whereas women grow bananas, vegetables, and other staples. Different crops are affected differently by the weather: A particular rainfall pattern may result in a good year for the male crops and a bad year for the female crops. In a study with Udry, Esther found that in good "male" years, more is spent on alcohol, tobacco, and personal luxury items for men (such as traditional items of clothing). In good "female" years, more resources are spent on little indulgences for women but also on food purchases for the household. What is particularly odd about these results is that spouses do not seem to be "insuring" each other. Knowing that they will be together for a long time, the husband could gift his wives some extra goodies in a good male year in return for some extras when the weather goes the other way. Informal insurance arrangements of this kind *between households* of the same ethnic group are not uncommon in Côte D'Ivoire,[43] so why do they not operate within the family?

One finding in Côte d'Ivoire gives us a useful hint about why families are different. There is a third "player" in the family drama—the modest yam, nutritious and easy to store, a staple food in the area. Yams are typically a "male" crop. But as the French anthropologist Claude Meillassoux explains, it is not a crop that the husband can freely sell and spend.[44] Yams are meant for the basic sustenance of the household. They can be sold, but only to pay for school fees or medical care for the children, not to buy a new blouse or some tobacco. And indeed,

when there is a good year for yams, the family does consume more yams, which is perhaps not surprising, but spending on food purchased in the market and on education also increases. The yam makes sure that everyone in the family is properly fed and educated.

Thus, what makes the family special is not that its members are effective in negotiating with each other: Quite the contrary—they operate by observing simple, socially enforceable rules such as "Thou shalt not sell thy child's yam to buy new Nikes" that safeguard their basic interests, without having to negotiate all the time. Other results also make more sense viewed in this light. We saw that when women make more money on their plots, the family eats more. This may be a product of another rule that Meillassoux describes: It is the woman who is in charge of feeding the family; her husband gives her a fixed amount of money for that, but then it is her job to figure out how to do it best.

The family is bound together then, not in perfect harmony or by the ability to always divide up resources and responsibilities efficiently, but by a very incomplete, very coarse, and often very loose "contract" that defines the responsibilities of each member toward the other members. It is likely that the contract has to be socially enforced, because children cannot negotiate with parents, or wives with husbands, on an equal basis, but society gains from all members of the family having something like a fair share of resources. The incomplete nature of the contract probably reflects the difficulty of enforcing anything more sophisticated. There is no way for anyone to make sure that parents feed their children the right number of yams, but society may be able to sanction or show disapproval of parents who are seen selling yams to buy sneakers.

One problem with rules that rely on social norms for enforcement is that these norms change slowly, and therefore there is always the risk that the rules are entirely out of sync with reality, sometimes with tragic consequences. In Indonesia in 2008, we met a middle-aged couple at their house, a small white-and-green bamboo structure built on pillars. Right next to it stood another white-and-green house, much larger, airy, made of concrete. It belonged to their daughter, who worked as a maid in the Middle East. The couple was obviously very

poor: The husband had a persistent cough and a headache that never seemed to go away, which made it hard for him to work. But he could not afford to see a doctor. Their younger child had dropped out of school after middle school because they could not afford his bus fare to the city. Suddenly, a four-year-old came into the room: She was visibly healthy, well fed, and dressed nicely in a pretty dress, with shoes that had little lights in them that went on and off as she ran around the room. It turned out that her grandparents were taking care of her while their daughter was away. Her mother sent money for the child, but nothing extra for the husband and wife. It seemed that they were the victims of some norm that had not yet shifted—married daughters were still not expected to take care of their parents, despite the obvious inequity it implied, but grandparents continued to feel obligated to take care of their granddaughters.

Despite the many obvious limitations of the family, society does not have another viable model for bringing up children, and though one day social pension programs and health insurance might free the elderly in today's poor countries from relying on their children for old-age care, it is not entirely obvious that it would make them (or their children) happier. The right space for policy is not so much to replace the family as it is to complete its action and, sometimes, protect us from its abuses. Starting from the right understanding of how families function is crucial in being able to do so effectively.

It is, for example, now widely recognized that public support programs that put money in the hands of women, like the Mexican program PROGRESA, for example, may be much more effective in directing resources toward children. In South Africa, at the end of apartheid, all men over sixty-five and women over sixty who did not have a private pension became eligible for a generous public pension. Many of these old people lived with their children and grandchildren, and the money was shared with the families. But it is only when a grandmother lived with a granddaughter that the granddaughter benefited: Those girls were significantly less likely to be stunted. Pensions received by a grandfather had no such effect. And there is more: Only if the pension was received by the girl's *maternal* grandmother was this effect seen.[45]

At least one of the two of us is inclined to interpret this evidence as saying that men are just a lot more selfish than women. But it may also be that this is where the norms and social expectations, which we argued play an important role in family decision-making, kick in. Perhaps women are expected to do things for the family when they get some windfall cash and men are not. If this is the case, not only who gets the money, but how it is earned, will also matter: Women may not feel that the money they have earned from their own work or their small business "belongs" to their family or their children. Paradoxically, it may be precisely because of women's traditional role in the family that public policy can get some mileage by empowering them.

We now return to the question of whether the poor really want such large families. Pak Sudarno wanted nine children. His large family was not the product of lack of self-control, lack of access to contraception, or even a norm imposed by society (although the fact that he got to make this decision may have been; his wife did not tell us what she would have wanted herself). At the same time, he believed that having nine children made him poor. So he did not really "want" so many children. He only needed nine children because there was no other way for him to be sure that at least one of them would support him later in his life. In an ideal world, he would have had fewer and tried to raise them as well as he could, but he would not have had to depend on them later.

Although many elderly people in the United States would prefer to spend more time with their children and grandchildren (at least if sitcoms are to be believed), the fact that they have the option of surviving on their own—thanks in part to Social Security and Medicare—may be very important for their dignity and their sense of self. It also means that they do not need to have lots of children in order to ensure that there will be someone to take care of them. They can have the number of children they really want, and if it turns out that none of them are willing or able to take care of them, there is always the public fallback.

The most effective population policy might therefore be to make it unnecessary to have so many children (in particular, so many male

children). Effective social safety nets (such as health insurance or old age pensions) or even the kind of financial development that enables people to profitably save for retirement could lead to a substantial reduction in fertility and perhaps also less discrimination against girls. In the second part of the book, we turn to how this can be done.