9

TO LEARN

The Importance of Showing Up

In September 2000, the UN launched an ambitious campaign against poverty by announcing the Millennium Development Goals (MDGs), a set of eight development benchmarks that, if achieved, would constitute a drastic reduction in suffering and privation around the world. It was a big plan on a big stage, and a lot of people were enthusiastic about it. The declaration containing the MDGs was adopted by 189 nations and signed by 147 heads of state and governments.

Such a consensus was a watershed moment in the global conversation about development and poverty. At last, the world's movers and shakers were in agreement (not perfect agreement, of course—many griped about their favorite initiatives being left out), if not about the principles that ought to guide development or the broad issues in most dire need of attention, then at least about specific targets and clearly defined indicators to measure them. Now, some argue that support for goals and targets can be too easily won—and means little—when the supporters themselves face no immediate consequences for failure. To quote Esther Duflo, "Nobody is going to come from Mars and say, 'You didn't reach the goals, so we will invade'—there is no onus [on the UN to reach them]."

In any event, one thing everybody could get behind was schooling, an easy rallying point. (After all, have you ever seen a political advertisement that announced a stand against *education*?)

Right near the top of the list of MDGs—second only to "Eradicate extreme poverty and hunger"—is "Achieve universal primary education." There are good reasons for the high ranking, not least of which is the fact that education trickles down into many of the development outcomes we care about. Educated people have better jobs, better health, and greater gender equality. Many also argue that education is an end in itself, that literacy and numeracy are essential to an active mental life that is ultimately its own reward. So, politically, education was an easy win for the UN.

Things were not so clear for Anthony, who lived in a small village in central Ghana. Like the UN, Anthony was convinced that education was valuable, both for its own sake and for the doors it would open in the future, and so he wanted more. Unfortunately, dignitaries' signatures alone couldn't help him.

Had he been asked to, though, he certainly could have appended his name to the UN's landmark declaration; when Jake met him he had just finished practicing his penmanship.

Jake's mom had come to visit him in Ghana during his time as a research assistant there. They had traveled along the pitted highway up to Lake Bosumtwi, a vast silvery disc bounded by the steep crater walls of an extinct volcano. They drove along the water's edge on a dusty track that came over a rise and curved to a stop in a flat dirt basin shaded by tall, wide trees. The village kids must have heard the car coming, for they were on it before it pulled to a stop. They were a motley crew, different shapes and sizes: tall, skinny teenage boys projecting authority, rambunctious younger boys terrorizing one another, prepubescent girls with little brothers and sisters on their hips. You could tell from the commotion that they didn't get too many visitors.

Jake and his mom were swept up in the little crowd and guided by some of the older boys through the trees and a small

reed marsh beyond to the shore of the lake, where they were invited to stand and marvel. They did. One teenage boy, who looked to be about seventeen years old, walked up while Jake was looking out over the water and tapped him on the shoulder. He was smiling hugely. He said, "Good afternoon!"

"Good afternoon. Thank you for bringing us to the lake."

"Oh, this lake." He pointed and looked past his outstretched finger over the water and kept smiling. "That is Lake Bosumtwi."

"Yes, I've heard."

"And I am Anthony."

"Hello, Anthony. It's nice to meet you. I'm Jake."

"*Tjchek*?"

"Or Jacob. Jacob is fine too."

"Oh, Mister Jacob! We are very glad to meet you." Anthony was still smiling. He had big, smooth, almond-shaped eyes that darted around and flashed excitedly.

"I'm glad too. You can just call me Jacob, though. I don't need to be Mister."

But the die had been cast. To Anthony, Jake was Mister Jacob that day and all the days that followed. When they were leaving the village a half hour later, he said *Mister Jacob* when he asked for Jake's mobile phone number, and when he took it down in his foolscap notebook he wrote "Mr. Jacob" next to it in neat, deliberate print with a blue ballpoint pen. That was when he showed off the pages of penmanship practice. It was mostly his name written over and over, spaced out evenly across the lines so they were arranged in tidy columns. "I did them this morning," he said.

Anthony called Jake a couple weeks later. He said he wanted to discuss something very important, and that he would come to Accra for a meeting. Because coming to the capital would cost him about six dollars (not to mention eight hours in a rickety

van), Jake suggested that they should talk it out over the phone, but he wouldn't budge. He would be there on Friday, he said.

Friday came and rain poured down so that the streets rushed like muddy streams in the spring melt. Somehow, Anthony fought his way out of the morass of the capital's central *trotro* station, with its scores of lurching, skidding vans, and up the hill to the General Post Office, where Jake found him sitting under the awning at the appointed hour. His clothes were wet, but not muddy, and he wore the same wide smile under his darting eyes.

They stood beneath the awning, and sheets of water fell on three sides. They almost had to yell to be heard over the rain. Anthony described his predicament. He was just finishing the SSS (Senior Secondary School) exams, which would determine his eligibility for tertiary education—university, polytechnic, or vocational training college—and he was worried. His parents, he explained, had put all their educational eggs in one basket, and the basket was almost empty.

Anthony was not the only child in his family, but he was the eldest—and, for the moment, the only one destined for SSS and beyond. His parents knew they did not have the money to send all their children to school beyond JSS (Junior Secondary School), so they pooled their limited resources and invested in him. His siblings' sacrifice meant that Anthony could continue on, at least for a while. For their part, the parents reasoned that the younger kids weren't dropping out for good; rather, once Anthony finished college and got a job befitting a graduate, he would earn enough to send his brothers and sisters back to school.

The family had recently made a heroic push, scraping and saving to pay the SSS exam fees, and now there was nothing left. High scores on the SSS exam could potentially lead to a scholarship to a tertiary institution, but first he had to apply. Each application carried a $40 fee. That's where Jake came in.

How could he refuse? If $40 (or $80, or $120) was really the missing link in a chain that would pull Anthony and his siblings up the educational ladder, then surely it was a worthwhile expense. But, like any good donor, Jake had some questions. First and foremost was: Where do you want to go for college, and why?

Jake hoped this would be a good conversation starter, but it stopped Anthony dead in his tracks. For a moment his smile fell and he looked out at the rain, still sloshing down in buckets, still deafening. Then he recovered himself and reeled off the names of three prominent institutions: a liberal arts university, an engineering polytechnic, and a college that trained teachers. He said, "I want to attend university so I can get my degree. That way I will develop myself and find better work."

"But those places you named are all very different. One trains teachers and another trains scientists. What is it you want to study? And what kind of work do you want to do in the future?"

"By all means, I will study geography. As for the work, I can be in a company. I would be a manager."

"A manager of what?"

"Oh, any kind of company will be fine. Or a bank."

It was becoming clear that Anthony didn't know exactly what he wanted. The trickiest part, it seemed, was right in front of him. Anthony didn't have a good sense of what tertiary education was about—of what one puts in and what one gets in return. Specifically, he never talked about acquiring expertise or skills that would ultimately find application in a job. But he spoke with great reverence about the college degree (*any* college degree) as if it were a very powerful talisman that would automatically confer wealth and prestige on its owner. His smile came back whenever he talked about it. The particulars—subject matter, educational institution, future employer—faded away. The value of higher education, it

seemed, resided wholly in gaining access to the mysterious power of the degree. It was not something he had ever thought to question.

That's not a strike against him; of course, the same is true of millions of high school graduates headed off to college, both in the United States and beyond. Many of us (Jake and me included) didn't settle on a specific career path before we finished high school. We pursued college degrees because we knew they were good to have, even if we were not sure exactly how we would use them. When we got to university we tried new things, stumbled on an interesting field of study, fell into a job—our paths were improvised and meandering. But it seemed that, with so much of his family's resources invested in his education, so much of their future hanging in the balance, and so minimal a cushion for mistakes, Anthony might have done well to have some kind of strategy.

So Jake pressed him on it, little by little. He tried working through it backward: Start with a realistic goal ("to get a job in a bank") and identify the best way to achieve it (study business, finance, or accounting at a four-year university). He tried working through it forward: Start with what you like to do ("play soccer"), now try again ("help my brother with his maths"), and see where you might end up if you followed that path (teaching math at a primary or secondary school).

At no time that afternoon were the contours of Anthony's future revealed in a flash, but he allowed that he had never thought about things in this way before. He was slowly edging toward a plan.

They had been talking for nearly an hour. It was getting late, and although they had stood under the balcony the whole time, they were both wet. Slowly but surely, the splatter from a gutter's gushing downspout had doused them. Anthony said he had to return to the *trotro* station so he wouldn't miss the last van heading north. His big, darting eyes looked out through the rain

and down the street coursing with muddy water, all bound for the bottom of the hill and the impossible bog of the station. Jake asked whether he had plans to return to Accra, so that they could talk more and decide how to proceed.

"Talk more?" he asked. "I thought you would help me with the application fees."

"But where are you going to send the applications? Have you already decided after our conversation?"

Here was the smile and the confidence; this was a question he was ready for. "Yes. I will send them to the three"—and here he reeled off the same three names again—"as I said before. So the cost is three times forty, or one twenty."

Jake was crestfallen. "But what about all we talked about? About planning a course of study and planning how it will lead toward a specific job?"

"Oh, by all means Mister Jacob, it will, it will." Smiling, waving his hands. "Anyway I didn't know we were talking about this very application period. I thought it was all in future. But please, Mister Jacob, the application is now, so I'm sure I can count on you?"

Anthony was probably not satisfied walking back through the rain with a measly fifteen dollars to cover his travel and food; and fortunately the story does not end here. We will see Anthony again soon. But we have heard enough already to open a window on one of the most pressing and pervasive problems with education for the poor.

Step One: Adding Students

Honestly, we can't claim to understand exactly how education—real learning—arises. But we do know some things about it. We'll start with the obvious: In schools, education is something that happens between teachers and students. We can be confident

about that much. But although students are an essential ingredient in the recipe, at least 115 million school-age children around the world aren't in school. Why not?

One explanation is price: It's just too expensive to send them. In some countries, the government does not provide any free public schooling, even at the primary level, and in these cases the cost of private school tuition alone puts education out of reach for many. But there are fewer and fewer such countries, and they account for only a fraction of missing education worldwide. Much of the problem is in countries where education is readily available—at least in theory. Ghana, for instance, technically provides free public education all the way through the end of SSS (equivalent to high school). So why should Anthony's parents be unable to afford secondary education for their children?

The answer, which is by no means unique to Ghana, is that even free schooling isn't completely free. First, there is the opportunity cost of education—that is, the money a student *could be earning* were he not in the classroom. And there are plenty of regular, explicit costs too. Students need to provide their own uniforms, notebooks, textbooks, pens and pencils, lunch money, and bus fare. Then there are PTA fees, additional charges for exam preparation (even, in the Ghanaian case, when it is conducted during regular school hours), and registration fees for nationwide standardized tests like Anthony's SSS exams.

The burden of these ancillary costs is enough to keep many poor children out of school. This is a dark cloud, but it has a silver lining. It implies that the will and desire for education is already there. Parents might not send their kids to school for lack of resources, but they would if they could. On its own, that's little more than cold comfort; fortunately, it also points the way to a solution. If people want education but can't afford it,

development programs could help bring more students in just by making it cheaper.

The other good news is that we can do more than speculate. Dozens of programs around the world aim to get more kids into classrooms by lowering the costs associated with schooling, and a number of them have been rigorously evaluated. These run the gamut of scale and complexity, from programs distributing single uniforms to pupils all the way up to nationwide initiatives with crossovers into public health. Let's look at a few.

Clothes Make the Student

Michael Kremer, the Harvard economist who conceived the space shuttle theory of development we saw in the last chapter, remains convinced that the basics really matter. The O-rings have to work. He and two students, David Evans and Muthoni Ngatia, suspected that simple things—uniforms, textbooks, notebooks, and the like—were the missing link. Maybe students who didn't have these materials were embarrassed to come to school. They proposed to test a simple solution with an RCT. They would give out uniforms for free to some students, and see whether their attendance improved.

They partnered with ICS Africa (the same organization that had worked on the Savings and Fertilizer Initiative we saw in the last chapter), which ran a sponsorship program for primary school students in western Kenya. The program used some of its donors' money to buy one uniform per year for sponsored students and to pay for some schoolwide benefits—a grant for classroom construction and books, several visits per year from a pair of trained nurses, and instruction from an agricultural representative who organized student clubs to grow crops on school grounds. The

schoolwide benefits were made available equally to all students, not just those who received sponsorships.

Twelve primary schools were chosen to participate in the RCT, and there were enough sponsorships to cover about half of the students. Recipients were chosen: First, students who had lost one or more parents were identified and selected; then the remaining sponsorships were allocated by lottery. Field officers made unannounced visits to the school to track the attendance of both sponsored and unsponsored children. They also monitored all students' performance on annual standardized tests.

Over the course of three years under the program, those who had received uniforms from ICS came to school more than their classmates who hadn't. At the beginning of the program, the absence rate hovered around 18 percent—so most students had been missing about one day of school per week. Based on the tracking data, the researchers found that receiving a uniform cut that number by 7 percentage points—more than a third.

Breaking down the students into subgroups, they saw another striking result. Among those receiving uniforms from ICS, the gains in attendance were concentrated around students who did not own even a single uniform when the program began. These students' absence rate dropped by 13 percentage points—more than two-thirds!—while the change in attendance for students who had at least one uniform at the outset was small and statistically indistinguishable from zero.

It looked like the researchers' initial suspicion was right. Providing one uniform to a student who had none made a big difference, but giving an additional uniform to a student who already had at least one did not.

Kremer's team and ICS had hit on a commonsense solution—one that many of the students' mothers surely would have applied

themselves, if they had had the means. They recognized that kids were embarrassed to go to a school where they stood out, and helped them feel more comfortable. To use Kremer's space shuttle analogy, providing uniforms to students who had none ensured that one of the many O-rings on the line to education held its seal.

Cutting Checks

Providing free uniforms is one way to get kids into classrooms, but it is certainly not the only way—and it may not be the best. What we really want to know is, for each dollar spent, what approach gives us the biggest education gains? We cannot evaluate a single idea and go home. At the end of day we have to choose between many seemingly good ideas. And that's where the uniform result gets turned inside out.

Another approach to making education cheaper is to do so directly, by paying people in return for going to school. Programs like these are called "conditional cash transfers," because they consist of direct payments to participants, conditional on their behavior. One success story of poverty alleviation through education is Mexico's Progresa program (now called Oportunidades), a government-run conditional cash transfer program that pays poor mothers if their children maintain a minimum of 85 percent attendance at school.

When it was begun in 1997, Progresa was one of the largest and most ambitious programs of its kind ever attempted. It came with a hefty price tag, and the government wanted to know just how much good it was doing with all that money. So they partnered with economists and designed an RCT to measure impacts on education and integrated it seamlessly with the phase-in of the program. In fact, the design turned a budget constraint into an advantage: At the outset there wasn't enough money to launch Progresa in all

495 targeted communities, so they randomly selected two-thirds of communities to receive the program right away, and monitored the rest as a control group for a two-year period. At the end of that time, when funds were available, Progresa was implemented in the control communities. Thus, they were able to perform a rigorous evaluation without excluding anyone they wished to help.

Paul Schultz, an economist at Yale University, crunched the numbers on Progresa's impact on school enrollment. It had been a home run. As expected, eligible students in participating communities were significantly less likely to drop out. The decrease in dropouts was spread across grade levels, but was concentrated where it needed to be—among secondary school students, who had had the highest dropout rates prior to the program.

Demonstrating effectiveness on such a large scale also caught people's attention. The Mexican government was rightfully applauded for having had the foresight to integrate an evaluation into its launch. More important, countries around the world started following Mexico's example. Today, thanks largely to Progresa, Colombia, Honduras, Jamaica, Nicaragua, Turkey, and a number of other countries are delivering similar conditional cash transfer programs to millions of families.

From Good to Better

The Subsidios program in Bogotá, Colombia, is one of Progresa's descendants. In the initial planning phase, the government had imagined a program that closely followed the Mexican example: Eligible families would receive monthly transfers if their children maintained 80 percent attendance or better. They also took a cue from Mexico's success and engaged a team of economists—Felipe Barrera-Osorio of the World Bank, Marianne Bertrand

of the Chicago Graduate School of Business, Leigh Linden of Columbia University and IPA, and Francisco Pérez-Calle of G|Exponential—to design an evaluation.

The economists saw an opportunity to make a good idea even better. They suggested that the government of Bogotá test out two tweaks that might improve the program's effectiveness without greatly increasing its price. The first variation was simply a change in timing: Instead of collecting the full payment each month, a third of the money would be held in a savings account, payable at the time of year when students reenrolled in school. The second variation actually changed the structure and conditions of payment. As in the first, eligible families received two-thirds of the regular amount each month, but in this variation they received a large bonus if the student graduated. If, after graduation, she matriculated immediately to a tertiary institution, they could collect the bonus early; if she didn't matriculate, they had to wait an additional year before collecting it.

Both of these variations come straight out of behavioral economics. They recognize that people do not make choices based solely on the dollar value of incentives, but that timing matters too. Think back to Vijaya, the flower seller we met in chapter 7, whose pocket money was never safe from her husband's unquenchable thirst. A standard Progresa-style conditional cash transfer program might not have served her family very well (though her drunkard husband probably would have liked those big monthly checks), but timing tweaks like these could have made a big difference.

The timing of the lump-sum bonus payment to coincide with students' reenrollment period was also a potential plus. It lightens the burden of the out-of-pocket expenses necessary at the beginning of a school year, and so increases the likelihood that families will make those essential purchases. Just think how

much easier back-to-school shopping seems when you've just cashed a big check.

The researchers rolled the basic program with the first variations into a single RCT so they could be compared side by side, and conducted a second RCT to evaluate the second variation. They tracked both attendance and enrollment for about thirteen thousand students: eight thousand who had each been randomly assigned to one of the three treatments (the standard program and the two variations), and five thousand who were monitored as a control group. After a year of observation it was clear that, on the whole, the incentive approach worked, as it had in Mexico. Students eligible for the treatments had about 12 to 26 percent fewer absences than their counterparts in the control group.

There was also evidence that the variations worked better than the standard conditional cash transfer program—that Bogotá had indeed found ways to improve on the successful Progresa model. Specifically, both variations had bigger impacts on matriculation rates than the basic Progresa-style program. It turned out that students eligible for the basic treatment were no more likely to enroll for the following year than control students, while those receiving the variations were significantly more likely to do so. What's more, the vast majority of the increase in year-to-year matriculation was driven by students who were predicted most likely to drop out. That means the incentives were reaching the people who needed them most.

But the most striking difference between the standard program and the two behaviorally motivated variations was in tertiary institution enrollment. Here the impact of the basic program was statistically indistinguishable from zero, while the variations increased enrollment substantially. Starting from an enrollment rate of 21 percent in the control group, both variations were big

improvements: The first increased tertiary enrollment by almost half, and the second more than tripled it!

We don't want to get lost in the numbers, but it is important to see just how powerful the details—like timing—can be. Like many other behavioral nudges we have seen so far, Bogotá's variations on the basic conditional cash transfer program have me excited. They are elegant and clever. More important, they are attractive to policymakers and practitioners, who understand—and would rather avoid—the challenges inherent in completely overhauling programs or designing new ones from scratch.

Subtle improvements like these, which leverage the importance of timing in household decision making, can have tremendous consequences.

The Surprise Knockout: Deworming

When all is said and done, there is one school attendance program that stands head and shoulders above the rest; and, to be honest, it snuck up on researchers unexpectedly.

Michael Kremer was at work again in Kenya, this time with Edward "Ted" Miguel of UC Berkeley, on the unseemly problem of worms—hookworm, roundworm, whipworm, and schistosomiasis. Many of us know these characters primarily as the villains of travelers' stories, where they usually amount to an annoyance; but they are a far more tragic reality of everyday life for billions, especially in developing countries. They infect one in four people worldwide.

Heavy worm infections can bring on symptoms like severe abdominal pain, anemia, and protein malnutrition, which might put a person out of commission; but the vast majority of cases are milder. Ironically, this is a big part of the problem. Worms can cause

a general and persistent malaise—lethargy, slight queasiness—that people get used to. Many live with it all the time.

Biologically, the worms are parasites that live and breed in human and animal feces. They are typically contracted when people come into contact with fecally contaminated water or soil. The particulars of transmission vary slightly from worm to worm, but they're all devastatingly easy to catch. Depending on the species, ingesting motes of contaminated dirt by eating with unwashed hands, playing in fresh water, or even walking barefoot through puddles near where infected people or animals have defecated—any of these commonplace behaviors could result in infection. It doesn't take much imagination to see why worms are a scourge of children in developing countries.

Fortunately, a highly effective treatment exists for these parasites—a single deworming pill that eradicates roughly 99 percent of worms currently in the body and provides protection for about four months. Even better, the total cost of manufacturing, transporting, and administering the treatment to at-risk children is about twenty cents per pill.

From a public health perspective, providing such an inexpensive cure to anybody who wants it is practically a no-brainer, purely on the basis of benefits to the individual, but there is actually a stronger case for giving deworming pills away. The spread of worms is a chain reaction: Worms spread through contaminated soil and water; soil and water become contaminated through the presence of contaminated feces; feces are contaminated only if the people producing them have worms. So when more people in a community are infected, they create a hazardous environment for everyone else. Conversely, when fewer individuals are infected, the rest of the community is safer too.

A case like this, where the general public benefits when an individual gets treatment, practically cries out for an intervention. We should do whatever we can to get people dewormed—not just for their own sake, but for everybody's. This sound reasoning was one of the factors that led Kremer and Miguel to get involved in evaluating a program that provided deworming pills for free to students in primary schools in western Kenya in 1998.

They partnered again with ICS (the same organization that gave away school uniforms) and devised a simple program. ICS officers would first meet with students' parents at the school to describe deworming and secure their consent. Then they would return and administer the pills to all the students whose parents had agreed. Most parents (about 80 percent) signed their children up.

Kremer and Miguel designed a study to test the impact of the program on both health and education outcomes. ICS had identified seventy-five primary schools to work with, and the researchers divided them into three groups. Twenty-five schools would get the program in 1998, twenty-five schools in 1999, and the remainder in 2001. Like the Progresa evaluation in Mexico, the phase-in design allowed ICS to provide treatment to everybody they wanted (albeit over time), and also generate rigorous evidence about their program.

Given the proven effectiveness of deworming medication, the researchers fully expected to see noticeable gains in students' health. They were not disappointed. The program cut the total number of worm infections in half—not just for those who took the pills, but for *all* the students in the schools where they were offered. It was the story of cascading community benefits, just as they had hoped: Disrupting the cycle of infection made even those who weren't taking the pills better off. There were simply fewer worms around to infect people.

But another result emerged that took them by surprise, at least in its magnitude: Students started coming to class more. A

lot more. The absence rate in program schools fell by about a quarter. Much to their—and the students'—satisfaction, ICS had hit on a tremendously powerful way to get kids into classrooms.

Dollar for dollar, it's no contest. The other attendance programs did work, but compared with deworming they cost an arm and a leg. Crunching the numbers, an additional year of school enrollment from Progresa comes out to about $1,000 a head. Generating an extra year of school attendance with the uniform-giveaway program costs roughly $100 per student. An additional year of attendance from deworming costs $3.50. Yes, you read that right.

Sure enough, the remarkable results of Miguel and Kremer's initial study made their way around the development world. Soon there was interest in school-based deworming far beyond the Kenyan bush. Miguel and Kremer were confident in the research they had done, but they weren't ready to recommend school-based deworming always and everywhere. They recognized that a single evaluation could only tell them so much.

At the end of the day, they had a sizable piece of hard evidence to support a simple theory: Where school absenteeism and worm infection rates are high, school-based deworming can be a powerful attendance driver. As with any scientific theory, the only way to add credence to theirs was to put it to the test again.

They didn't have to wait long. In 2001, just as the Kenyan study was wrapping up, Miguel, along with Gustavo Bobonis of the University of Toronto and Charu Puri-Sharma of India's Niramaya Health Foundation, designed an RCT to evaluate a deworming program for preschool students in Delhi, India. Here they were up against more than intestinal worms, which afflicted about one in three students. The other problem was anemia, another bane of children in developing countries that can be

reliably treated for pennies (in this case, with iron supplements) but rarely is. A staggering 69 percent of preschool students in their study suffered from the disease.

The program ran much like the Kenyan one: Program officers sought permission from students' parents, then administered deworming, iron, and vitamin A pills three times per year at schools. Sure enough, absence rates fell by about 20 percent—about the same amount they had fallen in Kenya.

Replicating the initial Kenyan result greatly strengthened the case for scaling up school-based deworming around the world. With a sensible theory—that school-based deworming can work in settings where worm infections are common—and mounting evidence to support it, advocates were soon beating the drums and calling from the hilltops. Their arguments were further bolstered by research by Hoyt Bleakley at the University of Chicago on historical data from the American South, where the Rockefeller Foundation's efforts to eradicate hookworm in 1910 led to higher incomes in the long run. Evidence still rolling in from Kenya corroborates this story. Follow-up surveys with participants from Kremer and Miguel's original deworming study found that, a decade later, students who had been assigned to the early treatment groups (and had thus received two or three additional years of school-based deworming treatment) were working 13 percent more hours and earning 20 to 29 percent more income than their late-treatment counterparts. Those are big, long-lasting gains from a few twenty-cent pills.

Happily, all this good news has grabbed people's attention. School-based deworming has been one of the great recent success stories of evidence-based decision making in development, with upward of twenty million students in 26 countries dewormed in 2009 alone.

Anthony Again

When we left Anthony he was walking through the rain down the hill toward the *trotro* station, hurrying to make it there in time for the last van heading north out of Accra. He had no free uniform, no merit scholarship, and no conditional cash transfer bonus waiting for him; but he did have aspirations and a potential benefactor, and these were better than nothing. Some weeks later, after more discussion (this time, thankfully, by phone), Jake agreed to pay the fees for two applications. One went to the four-year liberal arts university, and the other to the two-year training college for teachers. Anthony was on tenterhooks waiting for his admissions letters.

In mid-June he called to say he had been accepted to the training college, and a few weeks later came the news that he "might have a chance" at the university. He sounded excited. When Jake asked what "might have a chance" meant, he explained that some applicants are accepted outright, others rejected, and still others offered "a chance" to matriculate—meaning they can bribe an admissions officer to get a spot. Apparently it would have been gauche for the officer to name a specific price, but Anthony figured a couple hundred dollars would do the trick.

Now the picture was becoming clear, and it looked lousy. Jake told Anthony he was willing to cover tuition, but not a bribe. But Anthony was adamant that it wasn't really a bribe per se. This was how things worked. Still, Jake was disgusted just thinking about it—a big, smiling man closing his meaty hand around a stack of bills in some sweaty back office while Anthony stood nervously, also smiling, his eyes darting so as not to fix on the money. Besides, where would it end? Anthony conceded that students who slip in through the back door are sometimes called upon for more palm greasing later.

So Anthony settled for his second choice, the teacher training college. The good news was that simply being enrolled there gave him the opportunity to begin working right away, as a part-time teacher at a private elementary school. He found a job in a village not far from the college and began working that summer. He caught up with Jake some months later when he called to ask for a loan to cover his rent. He had been keeping a single room in a boardinghouse near the school.

Jake was confused. "Anthony, why can't you pay it yourself? Haven't you been earning money from teaching?"

"Yes, Mister Jacob, yes. I have been earning money from teaching. But it is just that I have not been getting it."

"Not getting what?"

"The money."

"I don't understand. Have you been paid?"

"Yes. No. That is, the school proprietor, the one who is owing us money. He said he wanted to pay us, the teachers, but he is not having anything."

"Oh. How can he do that? How can he ask you to work if he doesn't have money to pay you?"

"Yes, that is our challenge. As for the payment, he said he cannot give us what he himself does not have."

"Well, when was the last time you received a paycheck?"

"I am still waiting on that one."

Anthony had been working four months and hadn't seen a dime. He and the other teachers had a plan, though, and their plan made sense. If the proprietor couldn't pay, they wouldn't work. It was that simple. The only loose end, it seemed, was the students.

Step Two: Getting Teachers into Classrooms

As was said earlier, though we cannot claim to know the whole recipe for education, we are sure of at least two ingredients: students and teachers. So far in this chapter we have visited a number of innovative programs that helped to fill up classrooms. But there is a question on the lips of all those kids—in Anthony's school, for instance—who look up from their desks at an empty blackboard. Where is the teacher?

If you listen closely, you might hear this question being asked in Hindi. India has about a quarter-billion school-age children, many of whom suffer from teacher absenteeism on a regular basis. A series of unscheduled visits to rural schools across the country found that a quarter of teachers were missing, and that fully half of those who were in their classrooms were not teaching! That probably helps to explain some dismal facts about the state of learning in the country: A nationwide 2005 survey found that 65 percent of public school students in grades 2 through 5 couldn't read a simple paragraph, and 50 percent couldn't do basic arithmetic.

Those are bad numbers and they reflect grim realities for those children who do make it to school on time. Why should the teacher be an adversary, and not an ally, in the fight for education? Of course, teachers aren't *supposed* to skip school, but the fault is not entirely theirs. Some of the blame belongs to the principals and administrators who either fail to check that their classrooms are staffed, or, worse, who tolerate teacher absenteeism. Which is not to say that their jobs are easy either: Even with the right rules in place, monitoring teacher attendance in small rural schools is tedious and time-consuming.

A Picture Is Worth a Thousand Rupees

Seva Mandir, an Indian NGO, knows a thing or two about these problems. It runs about 150 small schools in the remote, hilly country outside Udaipur, a beautiful and ancient city in Rajasthan, a state in western India. The schools are one-room affairs in tribal villages with a single teacher each. Seva Mandir's response to the problem of teacher absenteeism was to innovate.

Working with Esther Duflo and Rema Hanna, an economist at Harvard University, they hit on a potential solution in a combination of monitoring and incentives. Since checking attendance directly was too cumbersome, they devised a clever way for teachers to do it themselves, using disposable cameras that cost a couple dollars each. At the beginning and end of each school day, a student was chosen to photograph the teacher and the rest of the class together. The cameras marked each photograph with a tamperproof time and date stamp. This way Seva Mandir administrators at the head office could verify weeks' worth of teacher attendance all at once by reviewing a roll of film.

Having cameras serve as their eyes in the field solved the monitoring problem, but they still needed to give teachers a reason not to get caught playing hooky. The program needed teeth. So Seva Mandir decided to tie teacher salaries to their attendance records. Under the old regime teachers were paid a thousand rupees (about $23) per month, provided they showed up at least twenty days, and warned that they could be dismissed for skipping. In practice, though, firings were very rare, even when it was clear they were well-deserved. The new plan was to pay a flat five hundred rupees ($11.50) per month for teaching ten or fewer days, plus an additional fifty rupees ($1.15) for each day over ten. The cameras were exactly the tool they needed to enforce the new incentive structure.

They thought they were onto something, but they would not be content with a hunch. As an organization, Seva Mandir is as serious about evaluation as it is about innovation. Its management firmly believes that the best way to help the poor is by drawing resources toward programs that have been proven effective, and repairing or abandoning programs that haven't. Duflo and Hanna coordinated an RCT and randomly assigned half of more than a hundred Seva Mandir schools to switch to the new system. The rest were monitored as a control group.

It didn't take any subtle analysis to see what was happening. The combination of cameras and incentives caused teachers to show up more—a lot more. Absences were halved, from 42 percent in comparison schools to 21 percent in the ones using the new system. Although student attendance rates didn't change in response to the program, the increase in teaching days alone meant that students were getting almost a third more instruction than under the old regime. Further, a series of unannounced field visits to the schools confirmed that teachers were actually teaching during these additional days, and not just showing up.

Everything came together at test time, when students at the camera schools performed markedly better than their counterparts under the old system. Encouraged by the hard evidence from the evaluation, Seva Mandir made the program standard policy for all its schools. The gains in teacher attendance persisted, and children continue to reap the benefits today.

When You Need More Than Attendance

In Mumbai, the issue was not that teachers were missing school; it was that schools were missing teachers. There were just more students than could be effectively taught.

Pratham, an Indian NGO, took a commonsense approach to the problem. If we don't have enough teachers, they figured, let's get more. In partnership with the government schools, they developed a program that pulled the lowest-achieving students out of class for two hours each school day to work on basic competencies with an instructor hired and trained by Pratham. The instructors were called *balsakhis*—Hindi for "the child's friend."

Esther Duflo, with fellow MIT economist Abhijit Banerjee, Shawn Cole of the Harvard Business School, and Leigh Linden of Columbia University, set up a study to find out whether, and how, the *balsakhi* program affected students' learning. They tested by monitoring test scores over two years for about 350 schools, roughly half of which had been randomly assigned to receive the program. As expected, the struggling students in *balsakhi* schools who were pulled out for remedial instruction did better. Even the optimists were surprised by the size of the improvement, though receiving instruction from a *balsakhi* produced just as big an increase in test scores as half a year of regular schooling.

On the Right Track

Clearly, the students targeted by the *balsakhi* program benefited from the extra attention they received. But one might have expected to see impacts across the board—even for students who never needed remedial instruction—since pulling out the low achievers effectively cut class size in half for two hours per day. Proponents of small classes have long argued that fewer pupils per teacher leads to more learning through increased individual attention, and instruction tailored to meet the needs of each student.

When smaller classes are created by dividing students according to their ability, the technique is known as tracking. Advocates

contend that tracking allows teachers to more effectively tailor their instruction to the level of the students. In contrast, when faced with a wide range of student ability, they are forced to "teach to the middle," leaving the struggling students overmatched and the stronger ones underserved. The opposing argument is that everyone benefits from sharing a classroom with the best and brightest, and so dividing classes by ability robs weaker students of a valuable resource.

The jury is still out on the value of tracking in general, but we can say one thing about it: In many contexts, it's a viable alternative. For a school already hiring additional teachers to reduce class size, tracking—by grouping students according to their grades on a prior year-end test, for instance—is cheap and easy. It can also be very powerful.

The *balsakhi* program in Mumbai was essentially a part-time tracking scheme. For two hours each school day, classes were effectively tracked when the weaker students were pulled out for remedial instruction. But students who didn't meet with the *balsakhis* appeared not to benefit much. In fact, the researchers couldn't rule out the possibility that the program had no effect on them at all. As we saw, there were some significant positive impacts from the program in general, but the evaluation can't say whether tracking in particular was an important part of the explanation, since it looked at the whole package: two hours' daily instruction from a specially trained *balsakhi* for some students, plus smaller classes and part-time tracking for all. To say more, we need an RCT that isolates the impact of tracking by itself.

Unsurprisingly, Esther Duflo, Pascaline Dupas, and Michael Kremer were hot on the trail, this time in Kenya. They partnered again with ICS Africa, now familiar from the uniform giveaway

and deworming programs, and designed another RCT. ICS was rolling out a program that identified primary schools with just one first-grade teacher and gave them grants to hire an additional one, effectively dividing each first grade class into two sections.

It was a golden opportunity to test tracking directly. In half the schools, students were assigned to sections based on their grades in the previous term. In the remaining schools, students were randomly assigned to sections. So the only difference between schools was the method of assignment into sections—by rank versus by chance—which gave the researchers just what they wanted.

The program was a success. In tracking schools, students' test scores in *both* sections improved more, on average, than those of their counterparts in nontracking schools. So, unlike in the *balsakhi* program, benefits seemed to accrue to all students—not just lower achievers. Another powerful piece of evidence came from students near the middle of the ability spectrum: They improved similarly, whether they were assigned to the higher or lower section. The top students in the lower sections and the bottom students in the higher sections fared equally well. That was a big win for tracking, as it suggested no students were losing out.

Which is not to say that opponents' arguments don't hold water; in fact, the study found evidence that smart kids *do* positively affect their classmates' learning. Presumably, students in the low sections of the tracking schools were missing out, but it appeared that their losses were overshadowed by the gains from teachers tailoring instruction to the level of students. The test scores supported this story: low-section students improved more in basic competencies, while high-section students improved more on advanced topics.

This approach is now one of IPA's scale-up efforts, with

a recent launch of a large pilot in Ghana under the leadership of research director Annie Duflo. If it proves successful in this context, the groundwork has been laid for a nationwide scale-up and for replication in other countries, with the generous support and enthusiasm of the Children's Investment Fund Foundation in the United Kingdom.

Another Surprise Knockout

Most education programs—and all the ones we've seen thus far—focus on getting teachers and students into schools. It does stand to reason. As I said at the beginning of the chapter, those are two ingredients virtually everyone can agree on.

Mark Twain was always an oddball, and, were he alive today, he might not be part of the consensus. He famously admonished, "Never let your schooling interfere with your education." Maybe he knew something others didn't about the elusive key to learning, or maybe he was just talking about the importance of life experience. But he probably wouldn't have guessed how apposite his comment would be to some corners of the world a century after his utterance. If he could see the decrepit schoolhouses of Uttar Pradesh, India, I bet he would have some even stronger things to say.

The school system in Uttar Pradesh was broken. There were spectacular failures of education across all subjects and grade levels. A 2005 survey of children aged seven to fourteen produced some dismal figures: One in seven kids couldn't recognize a written letter, one in three couldn't read numbers, and two-thirds were unable to read a short story written for first-graders. The survey also found that students' deficiencies went largely unnoticed by their parents. In the most severe cases, where children couldn't

recognize written letters, only a third of parents knew the extent of the problem. Most thought their children could read just fine.

This was in spite of a government program that sought to get local communities involved in making schools better. The vehicle for participation at the local level was the Village Education Committee, made up of three parents, the head teacher of the village, and the head of the village government. As the primary bridge between the villagers and the district-level education administration, the committees served many functions, from monitoring and reporting on classroom activities to hiring and firing teachers and allocating federal funds to schools. There seemed to be opportunities for regular people to make a difference in education, either by working through committee members or simply by joining.

Maybe those opportunities were mirages, or maybe people were just apathetic. Maybe both. Whatever the case, it is no surprise that parents were also neglecting the Village Education Committees, given the extent to which they were misinformed about their own kids' schooling. Ignorance about the committees was almost universal, with fewer than one in twenty parents aware of the their existence.

Incredibly, this ignorance extended to the committee members themselves! When asked which organizations they belonged to, barely a third of members mentioned the Village Education Committee; when specifically prompted about it, one in four still had nothing to say. What little awareness members had about the committees was mostly superficial. Almost nobody understood the roles and responsibilities of the committee. Only one in five members knew that they were entitled to government money at all, and just one in twenty-five knew they could request funds to hire additional teachers. The upshot was that Village Education

Committees were utterly ineffectual, and students were deprived of a valuable advocate.

Pratham, India's largest educational NGO, wasn't content to let the children of Uttar Pradesh suffer. They believed that if the villagers (including committee members) learned about the powers and duties of the committees, maybe they would respond. So Pratham partnered with researchers Abhijit Banerjee, Esther Duflo, and Rachel Glennerster, and with Stuti Khemani of the World Bank, to test three programs designed to kick village education into gear.

In the first and most basic program, Pratham organized a series of neighborhood-level meetings that culminated in a village-wide meeting to discuss the state of education, the role of the Village Education Committee, and the educational resources available from the federal government.

The second program had all the elements of the first, plus training on a testing tool that let villagers assess the level of students' learning. The assessments were conducted in each neighborhood and compiled in "report cards," which were discussed at the village-wide meeting. Villagers were also trained on a monitoring tool that allowed them to track progress in students' achievement over time.

The third program had all the elements of the second, plus training in Pratham's "Read India" program, a group-based reading skills curriculum. Once trained, villagers were encouraged to set up reading camps for local students and run them as volunteers.

Pratham chose 280 villages in Uttar Pradesh and randomly assigned a quarter to receive each program. The remaining quarter were monitored as a control group. After the programs had been running for a year, they surveyed to see what had changed.

Their first finding was encouraging: Across all three programs, the village meetings had been well-attended, with over a hundred villagers participating on average. On closer inspection, though, it looked like the meetings might have been a waste of time. There was a marginal increase in awareness of the Village Education Committees, but it was tiny relative to meeting attendance figures—so small, in fact, that it actually implied that many of the villagers who showed up never even learned of the committees' existence.

Whatever the impact on awareness, the functioning of the committees and the schooling situation—the real objects of the initiatives—were unchanged. There was no increase in the hiring of teachers, no change in parents' engagement with schools (e.g., visiting, volunteering, donating), no evidence of children switching schools, and no change in student or teacher attendance. It is hard to conclude anything except that the meetings had failed.

Fortunately there were some bright spots in all the darkness, and perhaps a key to the secret ingredient in the recipe for education. While the committees remained utterly useless, reading camps thrived. Of the sixty-five villages that had been offered training in Pratham's Read India program, fifty-five had started camps, serving an average of 135 children per village. The camps were tremendously successful, especially for the people who needed it most. Children who, at the outset, couldn't identify written letters, got a huge boost from the reading camps—they all learned to do so. By comparison, less than half of comparable children from non-reading-camp villages made the jump.

The wild success of the reading camps gives us reason to be hopeful. Even where schools are practically useless, and where parents are at best unable to coordinate their noble efforts at improvement (and at worst utterly apathetic), there are still ways to help. We just have to think outside the box—or, in this case, outside the schoolhouse.

Finding the Secret Ingredient

Students and teachers are easy to agree on; the pixie dust that makes the whole thing work is not. Some of the most promising results come straight out of left field.

We have to cast a wide net for solutions in education. The incredible impact of deworming on students' attendance and the power of reading camps to boost reading levels is proof positive that routes to learning don't all start and end in the classroom.

We in developed countries feast on quality education all the time, but in some sense we don't know what we're eating. One reason why it's so hard to identify the secret ingredient(s) is that school systems in rich countries typically have a great many things that their poorer counterparts lack, from well-appointed classrooms to healthier students to functioning PTAs. That means teasing out the effect of any one input alone just by looking at a well-functioning system is often impossible. (Indeed, the same difficulty also applies to research about improving farming, banking, health care, and other areas of life that touch us all, rich and poor alike.)

What we *can* do is go to the field and test. Little additions and changes, one or two at a time, to find out what makes education tick. We have touched here on some innovative ideas—but this is only the beginning. For starters, millions of schools around the world are still in dire need of the two most basic components: students and teachers. How many stories like Anthony's are out there?

Of course, questions also remain about textbooks, school lunches, classrooms, desks, and countless other inputs. The more we learn through rigorous testing and evaluation, the more of these we start to get right, and the closer we come to a recipe for education that nourishes everybody.

10
TO STAY HEALTHY

From Broken Legs to Parasites

For just over a year, Jake lived in a tidy compound house on Ring Road in Accra, Ghana. On a friend's recommendation he hired a housekeeper to clean and do laundry twice a week. Her name was Elizabeth, and in January 2008, she hurt her leg.

Jake found out about the incident a few weeks after it happened, when he called Elizabeth to ask why she hadn't been coming by the house to clean. He said, "Elizabeth, I haven't been seeing you recently."

"Oh, Brother Jake. I'm sorry I haven't been coming. I broke my leg."

"Elizabeth! What happened?"

"I was at market and I fell inside a ditch."

"Oh! I'm so sorry. Have you seen a doctor?"

"Yes, I went to hospital."

"And the doctor told you your leg is broken?"

"Yes. He said I have twisted it. Near the foot."

"Oh, so it is twisted. But is the bone itself broken?"

"Yes. The bone is not broken."

They had reached the limit of their ability to communicate over the phone. It was clear they would need the benefit of hand gestures to get the point across. Elizabeth said she was well enough to come the following Monday to clean. Then she would tell him the whole story.