ANDREA BORGARELLO FOR WORLD BANK

People taking part in a poverty-reduction trial in Niger receive cash and record-keeping booklets.

HOW TO REDUCE DIRE POVERTY

Randomized trials are changing how governments and aid organizations study — and deliver — measures to tackle inequality and poverty. **By Jeff Tollefson**

In 2012, the government of Niger began giving some of its poorest citizens free money. Over the next few years, around 100,000 participating households received 24 monthly payments of roughly US$16 — which more than doubled their typical spending power.

The programme was based on decades of evidence from carefully controlled trials, suggesting that simple cash infusions can transform lives. And Niger is not alone: cash transfers have become a popular tool as governments try to alleviate poverty.

Several years in, the effort in Niger would also serve as a crucial testing ground for a new generation of expanded assistance programmes that offer people various types of personal, social and economic support in addition to hard cash. In a report issued last year[1], the World Bank identified more than 200 such programmes in 75 countries, which collectively reach nearly 92 million people.

But that's just a fraction of the number of people living in extreme poverty. More than 650 million people across the globe get by on less than US$1.90 per day, with severe impacts on public health and social and political stability in many areas. Many countries have also witnessed deepening inequality, a trend that has only increased since the COVID-19 pandemic began (see page 638).

As in Niger, many of the latest anti-poverty programmes are grounded in science. Starting in the 1990s, researchers began to run randomized controlled trials — assigning participants to either receive an intervention or not — to test the effectiveness of various forms of help, ranging from subsidies for textbooks to direct distribution of money. Now, governments and aid organizations are starting to scale up the most promising strategies. They are also asking new questions about how to tackle inequality — and how to make sure programmes benefit those who need them most.

Some of the latest work comes from the Sahel region of Africa, where as much as 80% of the population lives in extreme poverty. Researchers from several leading non-governmental research organizations teamed up with the World Bank to work out ways to get more bang for each buck. Initial results from these trials, involving more than 50,000 households in Niger, Senegal, Mauritania and Burkina Faso, are showing the benefits of add-ons to cash transfers, such as business training and coaching to promote self confidence[2]. And the World Bank is already working with governments in eight countries across the global south to scale up — and study — similar schemes, says Arianna Legovini, an economist who heads the bank's

Development Impact Evaluation programme, headquartered in Washington DC.

Researchers recognize that meticulously planned and carefully delivered trials are not real life; nor are they easy to replicate across countries and cultures. One of the biggest challenges today, for instance, is to work out how to scale up pilot programmes to larger populations. Nonetheless, patterns are emerging: cash grants can be cheap and effective; early-childhood intervention can work; empowering women can have lasting impacts. Like many of her fellow scientists, Legovini is hopeful about the challenge of moving from science to public policy. "We're not there yet," Legovini says, "but I think we're getting better."

Cash benefits

One of the primary lessons from rigorous research into poverty reduction should not, perhaps, come as a surprise: giving people money makes them less poor. "It's almost arithmetic," says David Evans, an economist with the Center for Global Development in Washington DC.

And yet, it took years of research to allay fears that poor people, given free money, would decline legitimate work and squander their new-found resources on temptations such as alcohol and tobacco[3]. Not only did the 'labour/leisure trade-off' fail to materialize, but once economists started running trials, the opposite effect prevailed time and again: free money translated into free time, and poor people tended to use that time productively.

In one trial[4] conducted in 2011–13, economists tested a simple cash-transfer programme in Kenya. Two groups of roughly 250 participants received the equivalent of around $400, either as a lump sum or broken up into 9 equal payments; among those, 137 households received an extra $1,100 over the course of 7 months. The monthly instalments tended to promote food security, whereas lump-sum payments were more likely to be spent on durable goods such as furniture. In all cases, however, economic activity and psychological well-being improved. Subsequent work in Kenya[5], involving the infusion of about US$1,000 to more than 10,500 poor households across 653 randomized villages, suggested that the resulting increase in economic activity also benefited those who did not receive the payments.

"People are strapped, they are struggling, and when they get more money, that frees them up to do more, not less," says Dean Karlan, co-director of the Global Poverty Research Lab at Northwestern University in Evanston, Illinois, and a principal investigator on the Sahel trials. "Pretty consistently, that's what we see."

Some programmes come with conditions intended to promote education or public health, but the easiest and cheapest to administer is the unconditional cash transfer. "That's our benchmark," says Legovini. "If you can't do better than that, why bother?"

What economists have found is that often, they can do better. In 2015, Karlan was part of a team that published a landmark study[6] documenting persistent gains, in terms of income as well as physical and mental health, from a programme that offered more than just money. Piloted in six countries on three continents, the intervention provided a productive asset such as goats or chickens, as well as temporary monetary support and longer-term educational resources such as entrepreneurial training and life-skills coaching. This multi-pronged 'graduation' approach has become the gold standard, but economists are still tinkering with the model.

In the latest iteration in the Sahel[2], Karlan and his colleagues varied the interventions across more than 300 villages in which participants were already receiving small cash infusions through the government grant programme. Beginning in 2016, everybody participating in the treatment groups received business training, including an entrepreneurial course designed for illiterate people and regular sessions facilitated by local coaches. They also formed their own savings-and-loan association, designed to promote cash savings and give out loans in times of need.

In addition to the training, one group received a cash grant worth around US$310. And instead of cash, another group received exercises designed to promote interpersonal communication, community empowerment and other life skills. This second group also watched and discussed with other villagers a film about a couple who overcome various personal and economic challenges with the support of their family and community. The last treatment group received both the cash infusion and the extra psychosocial support.

Although communities that received the full treatment performed best, the results suggest that psychosocial interventions were as important as the cash infusion. Indeed, if cost effectiveness is the only consideration, the psychosocial intervention without the extra cash grant outperformed the other interventions. For Karlan, the message is clear. "We need to start thinking harder about some of these other aspects of poverty," he says. "It's not just about the money."

Scale matters

Scientists have learnt this lesson before. In a classic experiment[7] that pre-dates the current wave, paediatrician Sally Grantham-McGregor tested in-home interventions designed to bolster nutrition, mother–child interactions and cognitive development among more than 125 malnourished Jamaican children, who were aged 9–24 months at the start of the 2-year study in 1987. Two decades later, children in the treatment group earnt 25% more than their untreated peers; after three decades[8], the income disparity increased to 37%.

"When I started, I was told it was nonsense: you couldn't work with these mothers, because they were not educated enough," says Grantham-McGregor, who ran the experiment at the University of West Indies in Kingston before moving to University College London. "Now it's accepted that you can work with them, and you can have an impact."

But Grantham-McGregor's experience also demonstrates the fundamental challenges in running, interpreting and scaling up such experiments. Although she is amazed at the long-term effects of her study, she readily acknowledges that there is no way to determine what caused that impact: did the interventions work because they boosted the children's cognitive development, or changed the mothers' behaviour, or both?

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And then there's the challenge of expansion. When scientists tried to replicate the Jamaican experiment with around 700 children in Colombia and some 70,000 in Peru, the interventions had significantly smaller effects[9]. The lesson, Evans says, is both simple and daunting: scaling up interventions that depend on complex human interactions won't be easy.

"The fundamental technology is very simple for cash-transfer programmes," says Evans. "But with parent training, people are going in and building relationships and helping parents become better parents. That is more difficult."

To the extent that they rely on personal and social interventions, Evans warns that more-complex programmes such as the one in Niger could face similar challenges as governments try expanding them in the future.

Although replicating the Jamaican experience has proved difficult, Grantham-McGregor says there is little doubt that early interventions can change the lives of disadvantaged children. Her former colleagues at the University of the West Indies have developed online materials for the programme, dubbed Reach Up, that have been used by government agencies in several countries. But, she says, it's crucial to target interventions to the most disadvantaged people. "If you are interested in equity, if you can't reach them all, for God's sake reach the poorest children."

Missing targets

The need to ensure an even reach is on a lot of researchers' minds. As broader concerns

YASUYOSHI CHIBA/AFP/GETTY

A villager who took part in a universal-income study feeds chickens at her home in Kenya.

about racism, equity and inclusion have entered the spotlight in recent years, many scientists have taken a second look at randomized trials focused on issues such as poverty and public health. They have realized that these trials can systematically exclude those who need help the most.

Lawrence Mbuagbaw, a health researcher at McMaster University in Hamilton, Canada, first encountered this problem in his home country of Cameroon a decade ago, when he was studying whether text messages could help to ensure that people with HIV took their medication on time. The messaging system worked, but phone ownership was skewed towards the wealthy — and in those families that shared a phone, towards men[10]. Mbuagbaw came to realize that public-health research often reflects inequity — whether in the form of persistent technological divides, language barriers or cultural and geographic divisions — instead of tackling it.

In Cameroon, Mbuagbaw says, most of the research is conducted in French — a minority language there — and in a single region around the capital. "All of our health policy is based on research conducted in one province," he says.

And even in wealthy countries such as the United States, where most of the clinical research is conducted, many trials are run from hospitals in wealthy urban centres and consequently miss poor and often minority populations. If equity is a goal in such cases, Mbuagbaw says, then capturing a more representative population might require giving out travel subsidies or meal vouchers.

Other researchers share these concerns and are working on guidelines for designing and reporting better data from randomized trials. "Fundamentally, clinical trials are done for people who look very like me: middle-aged, affluent, fairly well-educated white males who are straight," says Shaun Treweek, a health researcher at the University of Aberdeen, UK. He rattles off examples: COVID-19 vaccine trials that excluded pregnant people, trials focusing on cognitive behavioural therapies for depression in which 93% of the participants are white, trials of all sorts that exclude older people or are limited to English speakers for no apparent reason.

Treweek and his colleagues, through an initiative called Trial Forge, have been developing a framework for clinical-trial design that aims to boost the participation of people from minority ethnic groups and other under-represented populations. The framework was launched in October 2020 and, shortly thereafter, the UK National Institute for Health Research (NIHR) adopted it as formal guidance. The message is clear, Treweek says: if you don't address questions about potential bias and diversity in your grant applications, "you are probably dead in the water".

Scientists won't always have the statistical power to assess how an intervention affects different groups of people, Mbuagbaw acknowledges. But at a minimum, they can help other researchers to do so. They can collect and report data on race and ethnicity, gender, education and socio-economic status among their participants, he says, enabling other researchers to pool data from many studies in a systematic review.

Similar concerns have been raised about global development: research into poverty interventions is often absent in the poorest countries, owing to conflict and political instability. And where there are trials, it's not always clear that the interventions being tested actually benefit those most in need.

In some cases, it's the better-off people in a given treatment group who benefit the most, says Annette Brown, principal economist at FHI 360, a company based in Durham, North Carolina, that works on global-development issues. She cites a trial[11] that began in Tanzania in 2010, in which people were given cash grants that depended on school attendance; researchers found that students from households that were better off were more likely to complete primary school than were their poorer peers.

And all too often, randomized trials of poverty interventions do not actually report information about the current wealth of the recipients or whether the interventions actually reduced poverty, says Markus Goldstein, an economist with the World Bank in Washington DC. A trial of an agricultural intervention, for instance, might focus on technology adoption while ignoring one of the most important questions: did its adoption promote wealth?

"We could do a better job of describing, at the very least, the levels of poverty of the people in our studies," says Goldstein. Karlan says no trial is perfect, and one focused on ultra-poor people could also miss the broader population of poor people. "You just have to be clear about the research you are doing," he says.

The challenges facing researchers and governments trying to tackle poverty and inequality will only increase. As efforts to scale up promising interventions continue, Legovini says, scientists must also seek to understand the long-term impacts on poor people, as well as the broader economic impact on communities. The good news is that science is no longer an afterthought in the development world. After starting the World Bank's Development Impact Evaluation programme with no staff in 2009, Legovini now has a small army of roughly 250 people, including consultants.

Moving forward, she hopes the same scientific tools will expand to cover other development programmes, including those targeted at infrastructure, climate and governance. It won't happen quickly, but Legovini thinks science can help policymakers to make better decisions across the board. "Development is complex, and we need to be committed to working in different settings and building knowledge and understanding of how to get things right."

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1. Andrews, C. *et al. The State of Economic Inclusion Report 2021* (World Bank, 2021).
2. Bossuroy, T. *et al. Nature* **605**, 291–297 (2022).
3. Evans, D. K. & Popova, A. *Econ. Dev. Cult. Change* **65**, 189–221 (2017).
4. Haushofer, J. & Shapiro, J. *Q. J. Econ.* **131**, 1973–2042 (2016).
5. Egger, D., Haushofer, J., Miguel, E., Niehaus, P. & Walker, M. W. Working Paper 26600 (NBER, 2019).
6. Banerjee, A. *et al. Science* **348**, 1260799 (2015).
7. Grantham-McGregor, S. M., Powell, C. A., Walker, S. P. & Himes, J. H. *Lancet* **338**, 1–5 (1991).
8. Gertler, P. *et al.* Working Paper 29292 (NBER, 2021).
9. Araujo, M. C., Rubio-Codina, M. & Schady, N. Working Paper Series IDB-WP-1230 (IDB, 2021).
10. Mbuagbaw, L. *et al. PLoS ONE* **7**, e46909 (2012).
11. Evans, D. K., Gale, C. & Kosec, K. Working Paper 563 (CGD, 2021).