Achieving Lasting Impact at Scale:
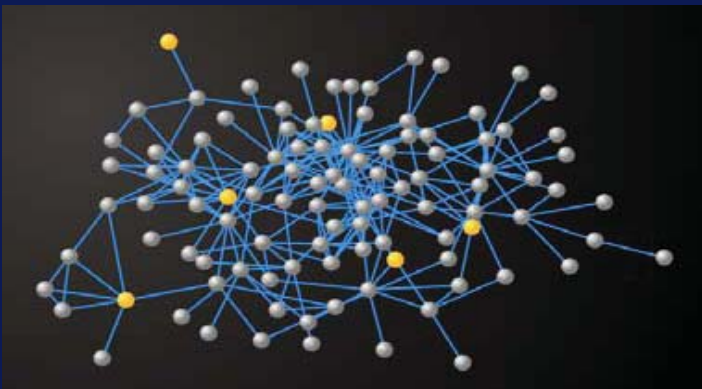
Behavior Change and the Spread of Family Health Innovations in Low-Income Countries

Introduction

Two days is not a lot of time, but perhaps 200 "conversation-days" is.

When 100 people – each an expert in his or her field – gathered together for two days in Seattle on November 1-2, 2011, they were contributing to a conversation that was several years old and will continue for several more. It was about how to achieve lasting impact on family health at scale.

Much has been said, and much remains to be said, so it is too early to draw conclusions. But the product of these discussions has the potential to radically change approaches to family health, and to greatly reduce preventable maternal and child deaths.

But before I begin to explain why I am so excited about the possibilities, let me say a little about how we got to Seattle and how I came to be synthesizing what we have learned so far.

It is not necessary to be super smart to recognize that money alone is insufficient to solve the world's great problems, such as the millions of children who die needlessly each year. The Bill & Melinda Gates Foundation can bring a lot of resources to bear on any challenge – but it also knows that progress depends on exploiting the best available knowledge.

So, in 2008, when the Foundation began in earnest to think about how it might play its part in meeting the United Nations' Millennium Goals Four and Five – to reduce child and maternal mortality and to achieve universal access to reproductive health – it began with the evidence base. The Family Health team at the Foundation rapidly uncovered more than 700 relevant papers from micro-economics, political science, sociology, psychology and other disciplines. They read the papers and began to invite some of the authors to come to Seattle to discuss their ideas.

A lot was learned. But the knowledge tended to be over-complicated. It often focused on the things that interest academics, which are not always the most relevant for practice. It generally drew on experiences in economically advantaged contexts.

These first explorations prompted a more systematic review of the literature. Several studies were commissioned, two of which got a good airing in Seattle. The first sifted through what is known about the social and behavioral changes that will be necessary to deliver biomedical interventions leading to sustainable population-based improvements in family health. The second examined what works in scaling up evidence-based interventions in low-income countries.

At the same time the Foundation was testing its emerging ideas on what it called "tracer innovations": products, practices, or platforms that had the potential to improve family health at scale and also to produce learning for future investments. Such was the impetus for the Bill & Melinda Gates Foundation's support for the project Alive and Thrive, which promotes breastfeeding and child nutrition in Bangladesh, Ethiopia, and Vietnam, and its funding of other major initiatives to improve reproductive health and save newborn lives in Bihar, Ghana, Mexico, and Central America.

By this stage, the Foundation was involved in a lot of transactions – with the experts, with the international aid community, with the governments of countries testing the tracer innovations, and with the grantees implementing or evaluating them.

But more could be learned from a conversation among these communities than from a series of bilateral exchanges. When Jeff Raikes became the Foundation's CEO, he brought with him a lot of ideas with fancy names (like "solution leverage") that had helped him and Bill Gates make Microsoft one of the biggest scale-up successes in history. These are ideas I will explore in more depth later in this synthesis.

For now, all that needs to be said is that the Bill & Melinda Gates Foundation came to realize that its progress depended on bringing together a diverse group of

experts to take a look at age-old problems through different lenses.

And this is where I join the story. The group I lead at the Social Research Unit at Dartington in the UK acts as a broker of knowledge, seeking to make ideas, evidence, and action more than the sum of their parts. This task demands exchanges among all of the people with a role to play in improving children's lives. But different disciplines, academic traditions, and cultures use their own languages, their own sets of nouns, verbs, and adjectives. While the sounds may be similar, the meanings are different – so some translation is needed. (I think of this process of translation as like helping a Spaniard talk to an Italian. The structure of the language is the same, as are many of the words, but the scope for misunderstanding, particularly in the spoken word, is huge.)

My role, Dartington's role, has been to facilitate the conversation, to find common agreement about the most important words and what they mean, so that we can put our newly shared vocabulary to use to produce solutions that would not have emerged from reviews of the evidence, or evaluations of large grants in Africa, Asia, and Central America, or from one-to-one meetings with experts in the World Bank, governments, or aid agencies.

Seattle was the first of many conversations that will, we hope, lead to significant improvements in child and maternal health throughout the world. I am mindful that our meeting room in Seattle was hardly big enough to accommodate a tenth of the people who can contribute, which is why there will be many other opportunities to take part in important discussions this year and next.

Center stage at Seattle was a framework for thinking about the scaling of impact in the Global South that emerged from one of the systematic reviews described above and prepared by a team from Yale University. Betsy Bradley and her colleagues had been asked by the Bill &

Melinda Gates Foundation to go out into the world and bring together what is known about how health innovations scale up in low-income countries. They were asked to develop an "actionable framework," which means a way of thinking, of framing a problem, that could be used in real-world settings by people investing to improve global family health.

Gentle pressure-testing of this model acted as a catalyst for what turned out to be about 50 important ideas about how to achieve lasting impact at scale, the core theme of this conversation.

Because no synthesis can encompass all that happened in those 200 conversation-days, I offer here a review. I bring to the task the frailties of potential misunderstanding, of personal excitement and impatience and optimism. I also bring the strengths of a content-neutral approach. I aim to report what I heard, not what I hoped to have heard. I am trying to hold up a mirror for the people who joined in the meeting, to provide a window for those who could not attend but are anxious to find out how it went, and to find words that will help us talk and understand each other a little better in the future.

Michael Little,
the Social Research Unit at Dartington

Contents

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Gary Darmstadt, Melinda Gates, Bill Novelli, and Nicholas Christakis trade ideas on behavioral change and social networks at the Seattle convening

Photo: Bill & Melinda Gates Foundation / Natalie Fobes

I. Starting the conversation

How can we make progress on improving the health of mothers and children around the world? Money, science, and political will are essential, but none is enough on its own. Real progress may come from bringing the best minds together, exploiting our diversity, working with users – and taking to heart a song about mustard seeds and sunflower oil

Convening in Seattle, November 2011

In the mid-1990s, Bill and Melinda Gates read a *New York Times* article on the widespread death of children in developing countries from diarrhea caused by rotavirus. As Bill Gates put it, this was a killer disease that could be treated for about the same price as a US citizen would spend on a cup of coffee. The story stimulated the Gates family to act. They shifted the mission of their Foundation to include global health, and both Bill and Melinda Gates began to work full-time on the challenge.

The Gates Foundation may be the world's largest philanthropic foundation, but even its resources are too small to radically reduce infant mortality and improve maternal health around the world. Success demands progress on many fronts. Invention, such as the production of new vaccines, is a given.

Innovation, to make effective prevention and treatments applicable to the diverse contexts in which children and mothers die around the world, is another.

Fundamental to success is the idea of scale. It is not enough to beat the rotavirus with one child, or a village of children, or even tens of thousands of children. To stop diarrhea claiming the lives of children under five it is necessary to beat the rotavirus *half a million times every year* in at least two continents. Since diarrhea is just one preventable cause of death for eight million children under five each year, the task is bigger still.

The breadth of the challenge led to the idea of **catalytic philanthropy**. The Foundation could not solve the problem by itself, but it could act as a catalyst to spur others with even greater resources – including governments – to a collective and effective response.

Part of the Foundation's commitment has been to start a conversation that would draw in expertise from around the world. The colloquy got underway in earnest in Seattle in November 2011 with a meeting that brought together more than 100 experts: specialists in family health and government; experts in public and private sector scale-up; scientists who explore behavior change, social networks and the spread of ideas; philanthropists seeking to pump-prime invention and innovation; ministers, public servants, practitioners, and policy makers responsible for delivering change.

By design, the initial discussions were broad and wide-ranging. There was no attempt to over-define the words that would be most frequently used over the two days, such as "scale," "diffusion," and "dissemination." (Appropriate as this flexibility was at the first stage, participants felt that more precision will be needed on these and other concepts if future exchanges are to be productive.)

The inputs to the convening were also intentionally broad. There were contributions from academia, the business community, the media, philanthropy, government and practice.

Two systematic reviews of the evidence commissioned by the Bill & Melinda Gates Foundation provided a focal point for extended discussions. A team from Yale University, led by Professor of Public Health Betsy Bradley, examined nearly 1,500 articles seeking to understand what works in scaling up evidence-based interventions in low-income countries. Doug Storey, from Johns Hopkins University, used a similar method to examine another 600-plus articles. His goal was to better understand social and behavior change necessary to deliver biomedical interventions leading to sustainable population-based improvements in family health.

Permitting an open space for ideas should not be confused with wooly thinking. As Melinda Gates put it in her opening remarks, "I hope you challenge the status quo, because that is what we need to break through." The Foundation is optimistic about reducing infant mortality and improving maternal health, but it is also impatient. It is looking for solutions sooner, not later.

Even as the conversation was being framed, I saw three themes emerging. **Catalysis** was the first. The meeting was a spark-plug seeking to fire a chain of other reactions. Second, **optimism** ran forcefully through the discussions. The problems we seek to solve seemed insurmountable – except when we reflected on the amount of intellectual firepower that could be brought collectively to bear. Finally, **impatience** also featured strongly. Most participants had worked long and hard to make significant but small inroads into the challenges of family health, innovation and scale. Most believe that the time may be right for a quantum leap, and that such a leap requires a collective effort.

MELINDA GATES, *Co-chair of the Bill & Melinda Gates Foundation*

After a long flight, conference introductions can be a little bit tedious. It is a ritual of courtesy to hear from the benefactor, but one does not expect to learn much. Not so with Melinda Gates. She knew about this stuff, and she cared about it. She was connected with the people in Africa and Asia she was trying to help, and she connected us to them. By the time she had finished talking, I felt I knew what the problem was, and I was keyed up and ready to play my part in finding the solution. She lifted the room.

Melinda reminded us of the epidemiology. Each year eight million children die before their fifth birthday. She referred to the *Lancet* article in 2005 that showed that the majority of these deaths take place in the first days of life.

What makes Melinda impatient is that most of these deaths are preventable by simple means. A clean and dry umbilical cord. Keeping the baby warm and free from infection. Breastfeeding and skin to skin contact. Using sunflower seed oil and not mustard oil to massage the baby.

But how do you help mothers to do what is best for their children? This is the scale impact challenge.

Melinda had us listen to a song from Uttar Pradesh where women sing about using sunflower seed oil for baby massage. It sounds corny as I report it here, but I can still hear the tune as I write. More importantly, Indian mothers may hear it in their own heads and hum it as they think about how to care for their child.

We saw another video, this time of an Ethiopian pop star, who stood atop a mountain and belted out fantastic melodies with messages about child health.

When it comes to finding ways to achieve lasting impact at scale, all the people stuff is as important as all the science. That, I think, is what Melinda was trying to convey.

Mother and child health: The problems for which we seek a solution

The day before the convening began, the world's population officially hit seven billion. There was much myth-building about the identity of this child. Was the seven billionth inhabitant of our planet baby Danica from the Philippines, or baby Nargis in Uttar Pradesh? Lost in this melee of claims about the birth of one child was the stark fact of the death of 21,000 young children – those who died of preventable causes before their fifth

birthday on the same day that Danica and Nargis came into the world.

Reducing infant mortality and boosting maternal health has been a life's work for most of the experts at the November convening, which is why so many were prepared to travel such long distances and give their time.

What exactly is the problem for which we seek a solution? The most specific exposition of the objective is contained in the United Nations' Millennium Goals Four and Five: **To reduce by two-thirds between 1990 and 2015 the under five**

mortality rate, to shrink by three-quarters maternal mortality, and to achieve universal access to reproductive health.

Progress is being made, but the world is in danger of missing both targets. As Melinda Gates blogged on Day One of the convening, "In 1960, about 20 million children died before they turned five years old. By 2010, that number was reduced to less than eight million. This is undeniable progress. But the fact that almost eight million children still die each year highlights the tremendous amount of work that still lies ahead. How will we continue to bring this number down?"

Some of the solutions are well known. Vaccines do exist, and can help to save lives of children from the one-month mark onward. Many family health interventions, such as making sure the umbilical cord is clean and dry to prevent infection, can help to reduce the 40 percent of under-five deaths that take place during the first month of life.

In fact, a lot is known about *impact*. What's missing from the equation is *scale*. As Melinda Gates put it at the convening, "How do we scale impact?"

To the untrained eye, the solution to many of the problems of mother and child health is simple. Is it not just a matter of telling a mother that exclusive breastfeeding for the first two years of life will probably lead to her child being healthier? Is it any more complicated than increasing the number of health practitioners in the community, getting more advice and the right drugs to the right people at the right time?

Unfortunately, simple and effective solutions to major social problems, whether getting people to use seat belts in cars, stop smoking, drink alcohol sensibly, eat a balanced diet, resolve family conflicts amicably – or any number of changes that would improve people's health – are generally difficult to spread. As human beings, we don't always know what is best for our own health or our children's health. And even when we know, we are often stubborn or unable to change.

In the technical terms used by the late sociologist Everett Rogers, the challenge is a matter of effective dissemination and diffusion of effective interventions. Jeff Raikes put it differently, also using Rogers' words, when he said that the Bill & Melinda Gates Foundation has to do what Microsoft did in its early days: it has to work out how to "accelerate the 'S' curve" – that is, to speed the process by which a trickle of early adopters becomes a flood of mainstream users, until finally the market is saturated by the no-longer-new product or idea.

JEFF RAIKES, *CEO, Bill & Melinda Gates Foundation*

I came off the stage just before Jeff Raikes came on, so I was sitting quite close. I was looking at him thinking, my god, this man is like Henry Ford, or Cyrus McCormick, except he is still alive; in fact, he looks like he is only just getting going. Every world-changing success story like Microsoft has a Raikes, the power behind the scenes who does the less sexy but crucial bit of the operation. Towards the end of his speech, when he pointed at me like a politician would point and said, "We are going to work this out and make this happen," I was practically off my seat, ready to do my bit.

He talked a lot about Microsoft, and the ingredients in Microsoft's successful scale-up. He talked about the "big bets" that they made in the early days of Microsoft – bets that made the most not only of radical shifts in technology, but also of a business model that got that technology to billions of people.

Raikes believes in functional collaboration. He has prospered from it. Around three-quarters of a million companies around the world make their own business out of Microsoft. Raikes got his company into enterprise consulting, selling IT architects to its suppliers, creating a network that leveraged solutions to common problems. It wasn't the most lucrative part of Microsoft's business, but it primed the pumps for scale.

These ideas translate into the Bill & Melinda Gates Foundation's approach to philanthropy. They are not a charity, filling gaps; or a builder of organizations, backing potential leaders. They aim to be a catalyst for the field.

So, for Raikes at least, the convening was a huge step forward. It brought together a large multi-disciplinary group, the beginnings of a network. We were already engaged in problem-solving rather than the art of intellectual persuasion.

And it sent out a signal about the direction being taken by the Bill & Melinda Gates Foundation. It had been known for its "upstream" work, backing invention and innovation, but it also wants to do well "downstream," helping every person and organization that can help to scale impact on global family health to do a better job.

Scaling impact means understanding how new ideas become accepted and healthy behaviors become widely adopted. The problem is to work out how effective ideas and solutions are passed from village to village, neighbor to neighbor, mother to child.

Hold on to what we know, but look at it differently

As diverse participants made their contribution to the convening, there was one common denominator. Nobody said, "Let's carry on doing what we did before." Most people recognized – even welcomed – the need to adapt and develop.

For instance, Jeff Raikes talked about the changes in the Bill & Melinda Gates Foundation's approach. He said, "We have been known for being an 'upstream' organization; now we are a 'downstream' organization as well." He meant that the Foundation has previously provided support for invention (like the development of vaccines) or innovation (finding new ways of getting those inventions to the people for whom they are intended) – but now they have also begun to engage with the delivery, at scale, of products, practices, and platforms with proven impact on family health.

Similarly, Don Berwick said something world-shattering that we would not have expected to hear from one of the world's greatest advocates for scientific method. He told the conference that, so rapid is the progress needed in worldwide health, both to achieve the UN's Millennium Goals and to advance the US health care system, it is no longer feasible to rely on "sequential evaluation" – if indeed it ever was.

By sequential evaluation, he meant the careful, step-by-step, "scientifically rigorous" process by which an invention is tested experimentally, many times, before it is rolled out to an expectant population. Many of us have come to take for granted the overriding scientific need for careful evaluation, but, Don Berwick told us, scale demands dynamic evaluation that can keep up with the even more overriding human need for progress, now. Scale demands greater risk taking, backing the "big bets" that seem most likely to pay off.

Overall, I sensed in the discussions a need to hold on to everything we know, but to look at it radically differently. Betsy Bradley reminded the audience that the "sequence" that leads from invention to mass adoption is actually not a sequence.

Many participants said it, but Doug Storey got there first: every time, *pull* (finding ways to help the people who will benefit from the innovation to want, to demand, to insist on getting the innovation) beats *push* (elbowing the novel approach into the life of a reluctant user).

Many of the participants work at the center of a universe – of government, of a large intermediary, of a delivery agent, or at the heart of major philanthropy. But scale requires engagement with the edges of these universes, with the local world inhabited by the people we seek to help.

One might have seen the convening as an opportunity to develop a master strategy, but nearly every head in the room nodded when Don Berwick said that "strategy is for amateurs but logistics is for professionals."

If the convening was the start of a longer conversation about how to scale impact, we found ourselves re-learning how to have that conversation. We need to challenge the status quo, as requested by Melinda Gates; and we need to do it with urgency and in a way that leads to concrete, effective action.

Exploiting the diversity of "We"

Many of the participants at the convening would have seen an advertising poster, at the airport or around about Seattle, on

INVENTION VS. DISSEMINATION

Many great scale-up successes are the result of a plural approach: one part invention, and one part dissemination.

Henry Ford didn't invent the motor car, and he wasn't even the first to use mass production. But he refined assembly line techniques and got the product to the world.

Cyrus McCormick made the harvest reaper that transformed the United States from a country of agriculture to one of industry, but the invention spread only after he found a financial model that allowed farmers to purchase his machine.

Toyota made the 50-year journey from successful sewing machine producer to the world's most successful motor car company not only with the quality of its products, but also with its method of getting the car to the driver "just in time."

In each case, it took more than a good invention to achieve scale.

Photo: The McCormick-Deering reaper at work in an Idaho wheat field, circa 1920. www.waterarchives.org

EVERETT ROGERS, *Sociologist and author of* Diffusion of Innovations

There was a ghost in the room for the Seattle convening. Sociologist Everett Rogers died in 2004, but his ideas, first and famously set out in his 1962 book *Diffusion of Innovations*, continue to influence.

Rogers is best known for classifying people's responses to innovation, showing how our awareness, interest, testing and adoption lead us to be, for example, "early adopters" of some new ideas but "laggards" when it comes to others.

Diffusion of Innovations is one of the most widely cited books in academia, and while there was no reference at the convening to Rogers personally, his words ("dissemination" and "diffusion," for example) and propositions (such as the "S" curve that predicts the speed with which a new product will be adopted) were common parlance.

After the convening, prompted to look at Rogers' work afresh, I was struck by how useful his theories have been to successful scaling, particularly in the field of technology. I was surprised to find that his broad-ranging interests had extended to public health in the Global South: he contributed to a radio drama that sought to improve family health in Tanzania.

I also had a moment of reflection about what would be occupying Rogers if he were still working today. Influenced, no doubt, by his farming background, he devoted his life to understanding how individuals respond to innovation. I suspect that, given a longer life, he might have shifted his gaze to the way in which groups – families, communities, villages and townships, organizations and governments – react to innovation.

Had he been in Seattle, I feel sure Rogers would be urging us to look closer at the role of intermediary organizations. He worked at Ohio State University where the "agricultural extension" service, which sat between the scientists in the laboratory and the farmer, helped to boost the rural economy. Rogers attributed the success of the extension service to its social structure; the people who met with the farmers were a lot more like farmers than scientists, and so farmers trusted them. Which organizations are ready to take this role in scaling impact on family health?
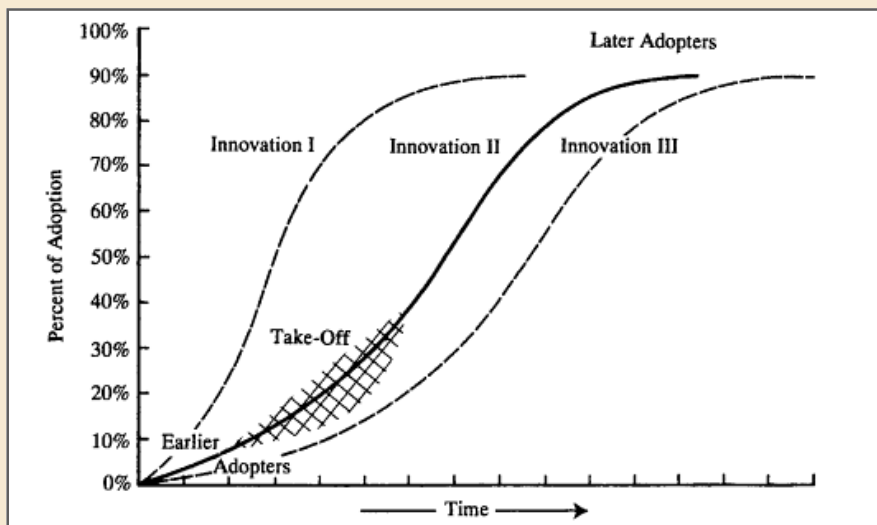
From Everett M. Rogers, *Diffusion of Innovations*, 5th Ed. New York: Free Press, 2003 [1962].

behalf of Rotary International. Bill Gates stares out of the poster and tells us, "We are this close to ending polio." His thumb and forefinger are placed either side of the words "this close."

The Gates Foundation is making a huge contribution to this dream, as, no doubt, are Rotary International. But it was the pronoun "We" that caught my eye. Eradicating polio demands that a lot of people do many things differently.

There was an impressive "We" at the Gates convening. Experts in child health sat alongside business leaders. Politicians and policy makers shared the platform with media experts. Many branches of academia were represented, and participants came from all corners of the globe.

But more important, the convening brought to prominence some interesting ideas about how best to exploit the diversity of "We." It became plain that people who have been successful at scale understand that the solution to *my* problem can be informed by the solution to *your* problem. The scale maestros have come to understand that talking to *you* about how to address *your* challenges will help *them* to address *their* challenges. In this case, listening to others is not a matter of being nice or respectful. It's a matter of getting the best solution. This way of thinking has a name. It is referred to as "solution leverage."

Solution leverage is closely linked to the prospect of "integrated innovation." Integrated innovation acknowledges that, on the supply chain running from initial invention to impact at scale, what I do at point A has consequences for people working at points B, C, and D in the same process. Integrating the innovation means a possible win at each of these points.

At the convening, there were many examples of actions at one stage of the innovation-to-scale journey spilling over into consequences for others later on. For example, philanthropy can pursue integrated innovation when it does more

than provide funding – when it instead tries to understand fully the needs and motivations of its grantees. Similarly, if investing in a platform like community health workers seems like an effective way to scale up health interventions, we will have more chance of succeeding in our investment if we can understand more deeply the motivations and rewards, in terms of income, status and aspirations, for the people who will fill the role.

One way to achieve solution leverage or integrated innovation is to "crowd-source." It's a matter of getting the myriad of actors on the highways and byways that lead from invention to mass take-up involved in a conversation about their respective challenges.

One might think of the Seattle convening as a conference, the beginning of a conversation. Or it might be described as a crowd-sourcing event. And as we continue the exchange maybe we can get better at bringing together ideas about how we solve contrasting obstacles.

For sure, many will have arrived in Seattle with some sense of the solution, as I admit I did – whereas I suspect most will have left reflecting on the need to build new collaborations and to think anew. ●

Andrews Yemetey from Ghana Infant Nutrition discusses the benefits and proper techniques of breastfeeding with Estherlyne Larkai as she feeds her daughter at the Osu Maternity Home in Accra, Ghana. Andrews encourages men to be involved in breastfeeding so that mothers have the necessary support.

Photo: Bill & Melinda Gates Foundation / Olivier Asselin

II. Impatience

Why do we keep imagining we can tell people what's best for them? Why do we keep inventing ideas thousands of miles from the people who will use them? Participants were impatient to learn from errors and obstacles – and to start taking up the huge opportunities to scale that are bound up in everyday behaviors

There are times when the challenge of scale becomes overwhelming. However, one thing I set against these undeniable frustrations is the firepower – intellectual and practical – gathered at the convening. And among those at the convening, there was an impatience to act, even when this means acting on imperfect information, a feeling that was explicitly encouraged in the keynote speeches at the end of the convening.

In this section, I draw attention to some of the big obstacles that we began to address in Seattle – barriers to understanding scale that we will continue to climb as the conversation continues in Ethiopia and India. For example, we need to take a catholic approach to evidence, while appreciating the benefits of scientific learning. We have to learn how to inject rigor and logic into non-

linear thinking. We should understand that flexibility in strategy and logistics may be a sign of mastery, not a sign of error. We have to move silo dismantlement from a cliché to a reality, finding an esperanto that allows us to work across the boundaries of nations, disciplines, sectors, and organizations.

Above all, we have to discover, in quick time, what can be counted as sufficient knowledge to inform some big bets on scaling impact, building the beginnings of a platform for future learning as we act to do more to achieve Millennium Goals Four and Five.

Learning from experience: Plural evidence

What more can we really learn about scale? During the course of the

conference, we got a taste of just how much knowledge is already available. We processed the findings from two systematic reviews covering more than 2,000 articles and heard from the leading experts in their fields. We reflected on countless exemplars from the real world – the world we seek to reach. As Doug Storey claimed, "We don't need more research."

I left the convening, as no doubt did many others, with a head bursting with information, thinking there is not much more to know, that it's just a matter of doing more with what is already known.

But as soon as I began to process what I learned in Seattle, I changed my mind. Not only do we know next to nothing about scaling, we are still working out how to articulate the challenge. Despite how much we know, we are far from understanding the process of scale as we desperately need to do.

Where will we get the knowledge we need? Over and over again, participants at the convening reminded us that we can learn from what has gone before.

We can **learn from success**. Child and maternal mortality rates have dropped significantly in several places since the introduction of the Millennium Goals. Although we quite rightly focus on the way that progress is too slow in areas such as sub-Saharan Africa and southern and western Asia, it is good to pause and reflect on how remarkable it is that Millennium Goal Four – reducing mortality of under-five-year-olds by more than two-thirds – is likely to be met in Latin America, East Asia, and North Africa.

The private sector boasts a plethora of scale triumphs, which often marry a breakthrough *process* to a breakthrough *product*. And the public sector has its own list of large-scale wins: consider the introduction of national health services, the provision of universal education, early years support, and national insurance schemes. Like the private sector, the state is no slouch when it comes to scale.

Many participants reflected on the opportunity to **learn from failure**. Sometimes the failure comes from a great idea that, for cultural or practical reasons, doesn't catch on and spread. The very promising idea of community health workers has taken root and taken off in some regions and countries, but not others. Why?

Other failures are the result of interventions that were successfully scaled up – but at a terrible human cost. Between 1870 and 1950 Britain exported, unaccompanied by their parents, hundreds of thousands of children to Canada, Australia and Zimbabwe, a mostly disastrous policy that took off because it was backed by people of strong social standing, made use of existing supply chains, spoke to the contemporary zeitgeist that impoverished kids deserved a fresh start, and connected a demand for cheap labour in the "new world" with a supply from the "old world." What will be the unforeseen risks and human costs of the interventions we pursue?

The obstacles to successful scale also provide a promising source of knowledge. Exclusive breastfeeding is widely considered one of the cheapest and most effective ways to improve infant health. But getting mothers to choose breastfeeding means beating the competition – and in many parts of the world, the competition is formula milk. Ironically, formula milk is one of the world's great scale success stories. Its producers got millions of the world's mothers to buy a product in place of the traditional, free, and mostly healthier alternative. How did they do it?

Finally, we can **learn from non-interventions.** Often, behaviors spread without any apparent push from a deliberate intervention. No grand design led to the rise of birth control, for example. Indeed, the spread of the practice, thanks to the demand by women and couples for ways to control their fertility, has occurred despite strong social and religious forces.

Figuring out lessons from the past will inform our future. However, underpinning a general readiness to highlight what we don't know was a deeper debate about how we go about filling these gaps in learning. How do we balance the immense value of collected scientific research, with the demand to acknowledge that traditional scientific approaches may not be the only, or even the best, way to approach the complex problems of scale?

COMPETING AND ADOPTING: Purple GV vs. Chlorhexidine

Most societies have a method for treating the severed umbilical cord of a newborn child. In relatively clean contexts, the best advice is to let the cord dry on its own. In less clean contexts, infections spread through the cord kill tens of thousands of children. Chlorhexidine, a cheap antiseptic, is a low-cost, effective way of preventing post-natal mortality. But it is little used.

In some parts of the world, the popular solution is to daub the child with Gentian Violet. GV is not a quack medicine; it does have antibacterial and antifungal properties and can be used to treat mouth ulcers, impetigo, thrush or yeast infections, and a host of other maladies. It is listed by the World Health Organization.

However, GV isn't a panacea. I thought of the medicine in the 1985 Big Audio Dynamite song "Medicine Show." That one was "multi-purpose in a jar, if you ain't ill it will fix your car" and "if you've got straight trousers it will give you flares." In fact, one thing Gentian Violet does *not* do is to prevent against infections of a severed umbilical cord.

Even though GV doesn't do much good for newborns, the bright purple smear sends out a clear, but falsely reassuring, signal that *something* has been done. And many people believe in it.

So, how can Chlorhexidine begin to compete with Gentian Violet? Tom Henrich came up with an imaginative solution. Why not put Chlorhexidine in the GV? GV offers the reach, the brand recognition, and the supply chain. Chlorhexidine brings the health benefits for the newly born child.

Photo: Bill & Melinda Gates Foundation / Sarah Elliott (Ethiopia, 2009).

Systematic reviews are valuable, but they are not nearly sufficient for a subject as dynamic and wide ranging as scaling impact. While we do need the best science to underpin invention, the application of invention to billions of people – making a lasting impact at scale – requires a more pluralistic approach to evidence, and an abundance of standards that we can apply to the bounty of questions and challenges that face us.

If it's not linear, what is it?

The team from the Yale School of Public Health, led by Betsy Bradley, gave us permission to stop thinking linearly. Our gut leads us to start with the invention, make sure it is effective, get it ready for

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THE YALE FRAMEWORK: The non-linear AIDED model of impact at scale

A focal point of the Seattle conversation was a framework to think about impact at scale that was created by the team from the Yale School of Public Health, emerging from their systematic review of previous research.

Not everyone liked the Yale framework, and its role in the convening was too prominent for some participants' tastes.

The benefits of other existing frameworks were cited. But the conceptual model for the determinants of diffusion created by Trisha Greenhalgh, of Barts and the London Medical School, was the only competitor to be rooted in empirical evidence. However, unlike the Yale model, her work is based on studies from wealthy nations. All the other frameworks brought to notice by participants were primarily focused on the way individuals adapt innovations, whereas Yale explicitly focused on the way in which groups – communities, villages, governments – respond to innovation.

Nonetheless, there was uniform appreciation for the non-linear approach intrinsic to the Yale framework. In the real world, we don't really start at A and progress neatly to Z in a tidy, step-wise way. As the diagram indicates, we should think instead in terms of loops, adjustments, adaptations, and feedback – and we should give ourselves permission to follow as many loops as we need in order to get optimal results.

The model's other undisputed merit is that it starts with the user group adopting the innovation, not with the innovation itself. At every step, it focuses on the habits and preferences of local users in their own contexts.

I find the Yale model most useful when I translate it into a series of questions. Because the model is non-linear, and every stage relates to the others, I must ask *all* of these questions at *every* stage. (I feel reasonably comfortable adapting Yale's ideas in this way, since they tell us to expect every innovation to be adapted by its users!)

Engage: What will help the user group to make the innovation a part of daily life, an instinct, second nature?

Innovate: How are you encouraging, with marketing and packaging, for example, the user group to adapt the product, platform, or practice for their local context?

Devolve: How are you preparing for *pull*, for the moment when you let go, stop pushing, and allow a myriad of user groups to take this innovation to a place you cannot envisage?

Assess: What are you doing to estimate the user group's receptivity to the innovation, to calculate demand and work out how it might be enhanced?

Develop: How are you building support in the contexts in which the innovation operates, breaking down resistance, getting local leaders onside, tapping into local norms?

Progression through AIDED components is not linear

Assess → Innovate → Develop → Engage → Devolve
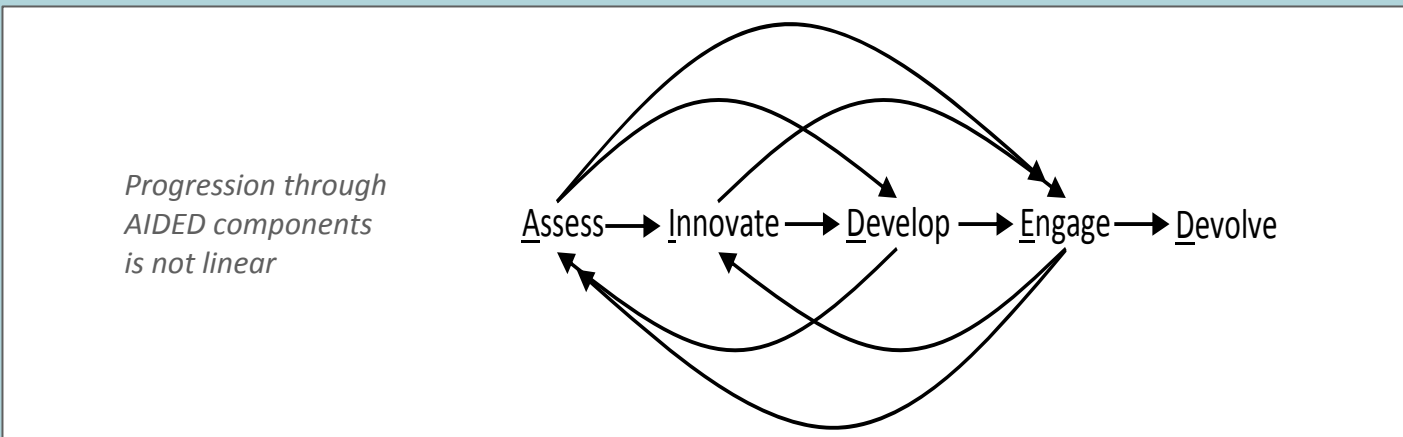
market, and then prepare each link in the supply chain for their role in getting it to the end user. Our instincts tell us to start with A and find a direct route to Z.

Our intuition also tells us that the world doesn't really operate this way. Participants had contrasting views about the Yale framework. Most liked it; a few people hated it. Most welcomed the way the framework made it legitimate to think about change as non-sequential – as something other than an orderly march from invention to success.

I am resistant to complexity theory. Too often it feels like a cop-out. So when Betsy Bradley talked about "complex adaptive systems," meaning the many moving, dynamic parts to which innovations must attach if they are to be successfully scaled, I admit I recoiled a little.

But again and again we were presented with empirical examples of systems that really are complex, dynamic, and non-linear. Sociologist Everett Rogers' "S" curve – the curve that describes how new ideas catch on slowly at first, then faster and faster, until only a few laggards are left – is itself complex and dynamic. Scale maestros consider how to accelerate the "S" curve, how to push an idea through its tentative early phases until the concept turns a corner and the numbers of joiners skyrocket. This is itself not a linear process. Similarly, statisticians often think of dynamic systems using Bayesian probability, which allows updating of hypotheses in the light of each new bit of data.

Nana Twum-Danso captured the mood of many working in the worlds we seek to impact at scale when she said, "We are coping with complexity. Every day demands constant re-alignment, checking-in, balancing the need to be faithful to the core while having sufficient adaptability to give ourselves an even chance of success."

Don Berwick pulled a huge rug of safety from under our feet when he described

"sequential evaluation" as toxic to scale. Most evaluation methods prefer to find out if something works step by step – testing just one change at a time, testing first with 500, and then 5,000, and then 500,000 people. But this method just won't do, Don said, in the world of scale.

To bring great ideas to scale at anything like the speed we need, we have to be willing to make multiple changes and to adjust along the way. Then the thing being assessed is dynamic – but the way we have come to think about evaluation is too static.

DON BERWICK, *Administrator for the Centers for Medicare and Medicaid*

The smartest people say so much with so few words. Don Berwick pitched up and said he couldn't add much to what had been a hugely informative and important conversation, and then proceeded, in the course of 30 minutes, to say a dozen things that made me think I needed to re-evaluate everything I have ever done. He took our world, tipped it upside down, and then put it the right way up again to see what was still standing.

Berwick is the impatient optimist personified. He told us we had to get busy. The US health care system is facing some stark choices, and making the wrong choice will badly damage an already damaged economy and harm the fragile existence of many individuals.

The big choice for the programs Don oversees – Medicare, Medicaid, and the Children's Health Insurance Program – is to cut existing provision or to improve efficiencies by improving and scaling what is already done. We would clearly get better outcomes by scaling efficiently, but if we take too long to work out how to improve and scale, the ticking political clocks will force us to cut. We may have to make good, bold, informed guesses fast, rather than waiting while we pin down every loose end.

Don then rattled off a list of "toxins" that poison the well of health improvement and scale around the world. Some people think *incentives suffice* – they don't. Some people say *teaching is sufficient*, when it is just the start. There is too much *insensitivity to local context*, when context is king. There is an *over-emphasis on central control*; we have to learn to let go. For some reason there is a belief that *third party learning is better than peer learning* – it's not. There is a fixation on *perfecting the intervention before it is scaled*, when it is pretty obvious that successful scale is going to involve the adaptation of the intervention. These and other toxins, Berwick demanded, have to be neutralized.

The last toxin was *sequential evaluation*, the idea that we invent, test in the lab, experiment on a trial population, evaluate barriers to implementation, and slowly, methodically, move out from scientific core to the people who might benefit on the edges of the scientific universe.

He said we needed a new palette of evaluation methods, ones that are fast in tempo, responsive to local settings, and designed with health improvement and scale in mind.

Many people could have said this. No doubt some have said it. But these were Don Berwick's words, and they should make a huge difference to the way in which we think about scaling impact.
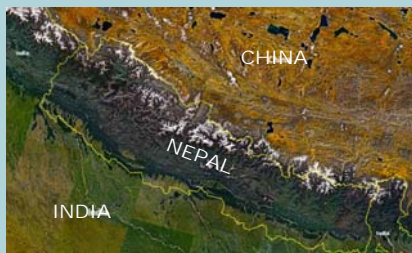
The antiseptic Chlorhexidine has been well tested. Randomized controlled trials show modest but significant reductions in infection transmitted to newborns via the umbilical cord.

One of the trials took place in Nepal. A few miles across the border in India, children – tens of thousands of children – die from infections transmitted via the umbilical cord. Surely the exciting news about this cheap, available, and effective disinfectant will be taken up across the state line? Not quite. Nepalese evaluations don't count in India. In fact, something evaluated across the border can sometimes excite the skepticism of Indian drug licensing authorities.

To a scientist, the location of a trial may not matter. If Chlorhexidine has antibacterial properties in Nepal, there is every reason to think it will have these same properties in India. To someone wanting to scale impact, the location of the trial matters a lot. Not so much for the result, but for the likelihood of that result leading to action.

Photo: Image from NASA Landsat 7

A recurrent theme, sitting between the Johns Hopkins and Yale reviews, was how to marry our thinking about individuals with how we think about groups of individuals. Both are the focus of work to scale impact, and each has its own dynamic and rules.

However, our problems aren't over once we agree that the worlds we're addressing are complex, and the processes to go to scale are dynamic and non-sequential. We don't know how to incorporate complexity into our thinking about scale, and we don't quite comprehend what the non-sequential looks like. Ashok Alexander asked early on Day One what others asked several times as the convening progressed: "How do we think about speed, sequence, and sustainability in the context of scale?" Ashok wanted to know how quickly objectives could reasonably be achieved, while at a post-convening meeting Philip Setel asked when can we be sure that an initiative has failed.

The convening was populated by classically trained people, ready to think logically, to test ideas against data, to translate propositions into budgets that can be properly accounted for, prepared to break down silos and to exercise a host of other skills demanded of contemporary leaders. All of this remains relevant, but new mastery is required, too: for example, to examine data for patterns, not answers, to embrace change and not use an agreed strategy as a crutch, to be prepared for the dynamics of scaling impact, to welcome unpredictability.

And, as I shall go on to say, not to let these new challenges become the enemy of action.

From arm's length to linking arms: Functional collaboration

Getting an invention to billions of people involves many organizations and disciplines, and it requires working across the globe, across nation states and cultures. It has become cliché to say that

we need to break down silos, but scaling impact almost demands firing a charge through every system, department and process.

The convening led me to understand that this charge comes more in the form of a common way of thinking than in a contractual or transactional relationship between partners. This idea can be illustrated with respect to public-private collaborations.

There were a lot of business leaders in the room. A crude view might be, "Let the private sector take over the business of pushing new inventions to scale. After all, it has been responsible for the game-changing victories of recent history." But a more sophisticated, and more useful, view might be, "How does the private sector think – and which bits of that thinking are going to help us with our challenges?"

Business process is clearly applicable. Marti Van Liere from Uniliver was among many who talked about the need for better business planning, market segmentation, and aspirational marketing.

Part of the requirement is quite basic. Mukesh Chawla pointed out that knowing who will pay – the user, an agency working on behalf of the consumer, or central or local government – frames much of the decision-making about scaling impact. Yet those responsible for getting innovations to a broad market are generally operating with too little information on cost, be it unit cost, start up cost, or opportunity cost. Rather surprisingly, while participants at the convening were calling for better information on costs and benefits of competing investment opportunities to aid their work, there is little available that is relevant to Millennium Goals Four and Five.

Similarly, a concept like "diminishing returns" is fundamental to good business planning, but it has not yet been translated for use in social decision-

making. The words "supply chain" were frequently used during the convening, but not always with the sophistication logistics experts would apply to multi-national business planning. Those working to scale impact on family health are beginning to segment their markets, but perhaps without the ruthlessness that the private sector might apply.

It became apparent from the convening that there was a dearth of effective intermediary organizations that could support the scale of impact on family health in the way that venture capital or business incubation has emerged to support private investment.

This application of ideas from one sphere (such as the private sector) to another (say, catalytic philanthropy aimed at scaling impact) is challenging. The concepts require translation. A supply chain for getting the antiseptic Chlorhexidine to the people attending a newborn baby will, by definition and by design, differ from a supply chain for getting a microprocessor to market. Once translated, the concepts need to be integrated into a broad way of thinking that also encapsulates ideas from other spheres – government, community, science, and so forth – that will contribute to the ultimate goal.

This challenge of scale is not going to be solved by transferring responsibility to, say, the private sector, or simply applying unrefined ideas from the private sector alone.

As the conversation gets underway, we are beginning to understand the need for **functional collaborations**: collaborations that are limited to those points of connection that are essential to achieve an agreed collective goal, and which are underpinned by a way of thinking expressed through a commonly understood vocabulary that links more than it divides.

## Perfection is the enemy of the good: Making informed big bets

We couldn't begin to resolve all the challenges in Seattle, but participants were still, quite rightly, impatient to get on. Every day we continue to work this out, another 21,000 children under the age of five die. The strong sense was this: we can't afford to wait until we've worked out all the details.

And so the convening ended with a huge sense of the compulsion to act. Don Berwick captured the mood when he juxtaposed the challenge to scale impact on global family health with the challenge to save the ailing US health care system. With the latter, he said, we have two options. We can cut. Or we can achieve efficiencies by scaling innovation. We could spend a lot of time carefully analyzing how to scale innovation – but if we spend too much time in careful analysis, the political pressure to cut will win. Therefore, although we have imperfect information, we should get on and scale.

Don Berwick was followed by Jeff Raikes, who reminded us of the big bets

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M. RASHAD MASSOUD, *Director, USAID Health Care Improvement Project*
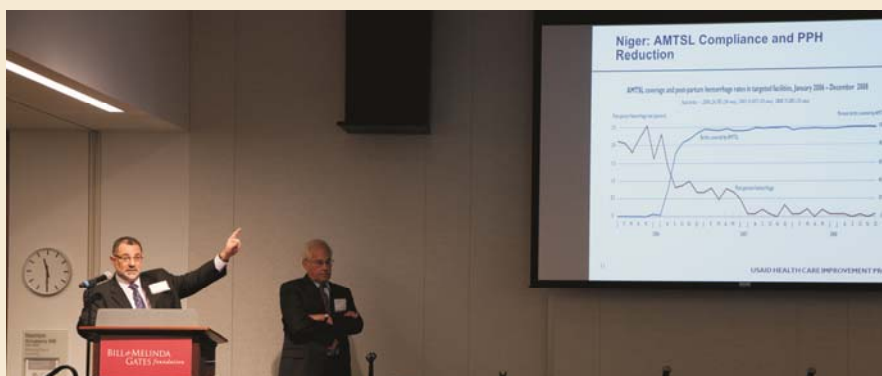
To illustrate the potential of scaling impact and health improvement, Don Berwick invited M. Rashad Massoud to the podium to talk about Active Management in the Third Stage of Labor, or AMTSL. This is a health process that includes the use of the drug oxytocin to induce contractions immediately after the delivery of the baby, followed by careful treatment of the umbilical cord, massage of the mother's abdomen immediately after delivery of the placenta, and continued assessments for up to two hours.

While there is nothing particularly remarkable about any of the individual components of AMTSL, putting them together into a simple protocol has been shown to reduce blood loss after delivery and therefore reduce the most common cause of maternal death in childbirth. It is a high-impact intervention, but it has to be made to work in context.

Rashad described the application of the protocol in Niger. At first, AMTSL was not being used for every patient – not because medical staff were unaware of its benefits, but because the temperature-sensitive oxytocin was kept refrigerated at pharmacies, which were only open in the daytime. The drug was unavailable for women giving birth at night.

In the graph to which Rashad points above, the blue line shows the increase in the use of AMTSL; the red line shows the drop in post-partum hemorrhage. The big jump in success a few months after the start of the project came as the result of a small adaptation – the placement of coolers in maternity wards to keep the oxytocin cool, suddenly making this life-saving procedure reliably available to every mother.

NEAL BAER, *Television Producer and Pediatrician*

WHAT'S THE STORY, NEAL?

One of the pleasures of life is being asked to do good works, like moderate a panel that comprises people like Neal Baer. He showed us a 90-second clip from one of the TV shows he has produced, *Law and Order*, and within seconds – I was sitting with him looking at the audience – he had everyone fully engaged in a social issue entirely unrelated to scale.

His message was simple. We force-feed ourselves facts and figures but we relate best to stories. Baer puts it more eloquently than I can in his Impatient Optimists blog entry:

"Stories are the currency of our lives, they are the measure of our days. We are nothing without our stories, because stories encapsulate our fears, our failures, our dreams, and our desires. We understand and make sense of our own lives by telling stories about ourselves and others. People who can't tell stories, like those afflicted with Alzheimer's disease, are lost to us."

Just as the challenge to sequential evaluation does not impel us to abandon science, and the value of starting with the user is not an excuse to forget the innovation, Baer is not asking us to ignore facts and figures. They are fundamental, he says, to helping us to grapple with complex social issues. But every fact hides a story, and each story has the power to make us see a different point of view: the perspective of the protagonists.

Baer gave us some practical examples of how to use storytelling in the service of scale. He noted how few stories in his native Los Angeles newspapers were about the world that the Seattle conference participants cared about most, so he arranged a trip for journalists to visit Africa and Asia. They became captivated by this new world, engaged with the people who lived there, and were motivated to retell the stories they heard. Before long, LA column inches were being devoted to the lives of people thousands of miles away.

The media that are available to collect and relate stories are more varied than at any point in history – yet relatively little use is made of the opportunity to spread ideas that may improve human health and happiness.

The minute I walked off the stage with Baer, I found myself reflecting not only on an idea – about the words that might make a common language in which we can talk to each other and tell our stories – but also on particular stories, and on their lead characters.

Some examples: Dai Hozumi collects stories from Japanese women's blogs about how they parent; Kaosar Afsana finds a verse in the Koran that helps boost breastfeeding rates in Bangladesh; Kristen Tolle builds a machine to help preserve a dying language in a far-off world.

I don't have space here to develop these narratives, but I came away from Seattle with the seed, planted by Baer, that more needs to be done to collect and share the stories of the people who are working to improve the health of mothers and children around the world. They can inspire, teach, and shake us into new ways of thinking and acting.

that paid off for Microsoft. In retrospect, it is obvious now that the company's ground-breaking software, multiplied by the radical approach to licensing software, equals one of the planet's most successful companies – but it wasn't obvious when the big bets were being placed.

Bill Gates and Jeff Raikes gambled. However, they weren't buying lottery tickets; their wagers were well informed. And they paid off. Of course, we should bear in mind that others, with equally ground-breaking products, lost their deposit.

Scaling impact demands a similar approach. As I found out at the convening, it is not a fine science. By default, there has to be scope for the invention to be adapted by and for the user. These adaptations will occur again and again – and the results are not predictable. The sum total of change will, almost inevitably, produce more failures than successes.

Any action, therefore, will be a wager. It involves a bet on the product (will it take a big chunk out of child or maternal mortality rates?) and on the delivery of that product (are we giving it the best chance of success?)

So what do those backing a "scale impact" horse have to know before they place their bet? The convening in Seattle began to sketch out the main headings.

First, there is a need to know that the product, practice, or platform works on a small scale, and has the potential to work at a large scale. Small scale effectiveness can be estimated through conventional means, say a series of experimental trials, but large scale will involve factoring in the simplicity of the product, the potential demand and the extent to which adaptation is likely to undermine impact. (Indeed, what we know about adaptation gives us two pieces of the jigsaw that so far fail to fit neatly into the puzzle. On one hand, we have authoritative evidence that adaptation at small scale leads to

poor outcomes; and on the other, we know adaptation is a necessity for success on a large scale.)

Second, there is a clear mandate to engage the user, which means engaging with both groups – governments, intermediaries, delivery agents, communities – and individuals. Success can be enhanced by working out if the agents in the supply chain are ready to make their contributions.

Third, these estimations will act as a backdrop to another primary calculation: will the product continue to spread once the initial catalyst has been withdrawn? An informed "scale impact" gambler will lay money on products for which there is a strong *pull*, where *push* is minimized, and the satisfied customer becomes the primary force for continued take-up.

Finally, before pulling the trigger on the scale gun, there will be clarity about what is generic and what is context-specific. As Rajeet Pannu explained, this is something that pharmaceutical giants have worked out. They separate processes that apply to every product, such as drug safety, from those that apply to specific products, such as meeting country-defined licensing procedures.

As the conversation continues, this list of knowledge needed to inform investment decisions will be refined. But even now there is sufficient information to build a portfolio of investments, perhaps including some safe bets that have a high chance of giving a relatively low pay-off, and some long shots that will make a big difference in the unlikely event that they hit the target.

Cutting through these discussions was an acknowledgement that attempts at scale will involve failure. This sounds like an obvious thing to say, until one reflects on the "planning every detail to achieve success" mentality that has hampered many previous attempts to make major steps towards Millennium Goals Four and Five. ●

PIECES THAT DON'T FIT THE PUZZLE

The convening generated many pieces of a jigsaw puzzle, but unsurprisingly, given the limited time available, failed to make them all fit. We have not worked out, for example, how the good empirical evidence that adaptation in small-scale experiments generally reduces impact can be congruent with the equally sound research showing that adaptation is fundamental to impact at scale. Is adaptation to be avoided or encouraged – or both in turn?

Similarly, innovations that have been tested to perfection in experiments have often proved difficult or impossible to scale. This paradox has led, quite understandably, to searching questions about the sequential evaluation model. But the absence of perfection does not imply an absence of science or rigorous testing. This piece in the puzzle requires that we learn, in theory and from practice to practice, what is core to an innovation and what is adaptable; or, putting it more technically, it requires that we understand the critical components of an innovation.

Another tension emerges with the finding by the Yale team that impact at scale means starting with the user – working out what she wants and will use – and not starting with the innovation. But by default, the user must have some *thing*, some innovation to consider, before she can decide whether she would want it or use it.

Some of these challenges are little more than "chicken or egg" philosophical conundrums that will matter little in the real world. But some point to the limits of our understanding and the need for greater discovery.

Community members participate in discussions after watching video documentaries screened by the Self Employed Women's Association in an urban slum. (Ahmedabad, India, 2010)

Photo: Bill & Melinda Gates Foundation / Prashant Panjiar

III. Optimism

We know that impacts on family health are contagious – and we believe we can figure out how contagion works, and how to use it. Knowing that we need to turn our usual thinking on its head and start with the community, not with the innovation, is itself grounds for optimism

Since the convening was the start of a longer conversation, it would be unrealistic to expect it to conclude with a prescription, or even a book full of prescriptions. But it did give much reason for optimism. The discussion sent out a number of clear signals about what kinds of activity are likely to underpin the scaling of impact or, at very least, what we need to learn in order to get better at the task.

Much of this is about sequence. When it comes to social innovation, improving human health and development, the starting point is usually the development of the "thing" – the drug, the therapy, the new process – that is found to produce better outcomes. But scaling impact may require a different sequence. Successful scaling demands that we begin with the idea of scale in mind, and then find a "thing" that may be possible to scale, as

well as to have an impact in the context for which it is designed.

That means engaging with the people who will benefit from the innovation, and with those who help to deliver the innovation, creating the funding arrangements, dealing with logistics, and most importantly, acting as the point of contact with the end user. As I go on to describe, the point of connection is emotional as well as structural. Moreover, it will be rooted in and adaptable to the contexts in which the impact will be scaled. *Context is king*. These words chimed well with the Seattle participants.

Design with scale in mind

A constant message in the variety of discussions at the Seattle convening was this: design with scale in mind.

To those who were at the convening, or to many of those who join this conversation, this will seem such an obvious thing to say that it is hardly worth saying. But, when it comes to social issues such as reducing maternal and infant mortality, the archetype has been to start with an invention, to test it in controlled conditions, to pilot it, and then to try to roll it out. This slow road usually begins in a place of learning and ends, often in failure, with the people we are trying to help in the place where they live.

Yale were the innovators in getting us to abandon this paradigm. Betsy Bradley and her colleagues said it once, and they said it a dozen times, and then the rest of us started saying it on their behalf: start with the community, not with the innovation.

Design Kias, not Cadillacs

I'll say it again: start with the community, not with the innovation. Start with the mothers whose babies are suffering because of dirty water in baby formula, not with the benefits of breastfeeding.

Start with hospitals that fail to stem the transmission of infection after birth, not with the potential of Chlorhexidine. Start with the village without clean water, not the miracle to clean that water invented in the US.

This simple inversion of the perspective leads to radical changes in the behavior and potential for success for those seeking to scale impact. Those starting with an innovation are, quite naturally, often most interested in finding people who need the innovation, and in discovering whether the innovation can produce the results: the focus remains on the innovation. Those starting with the community have a very different focus – one that tends to zero in on the people, the users. They will want to know the potential demand for the innovation. Even if it is technically effective, will anyone use it? If not, what kinds of things will be used – and can these achieve the desired impact?

Nana Twum-Danso put it most starkly. She said we are dealing with huge problems. So why are we putting so much resource into designing a range of Cadillacs when the market demands a Kia? Ken Leonard was also direct in his observation that we don't really have anything to scale until we understand the desires, motivations, and choices of the user.

Inverting the perspective, so that it focuses on what the consumer will use and not on what we want to supply, can lead to radical solutions. For example, Lisa Howard-Grabman reported back on how her discussion group had begun to examine how households and communities could become effective producers of health, effectively switching the focus from health services to people's health, and from professional intervention to individuals' and communities' day-to-day practices.

Rightsizing

There was much talk about "rightsizing." This is a very American word. It assumes that what is on offer is *not* the right size, and that it has to be made the right size to do the right job. People have got used to rightsizing their computers to do what they need; companies rightsize their suppliers. The smart producer works out what the consumer wants and does the rightsizing for them.

Doug Storey picked up this theme when he said that there was no single effective method of scaling impact that he could identify in the research literature. Rather, it is a matter of finding the right match between a scaling strategy and the product. That means understanding the communities we seek to reach.

Noshir Contractor expanded on this theme, distinguishing between scale that is incremental (bleeding an idea from a central source to a welcoming market), disruptive (shaking up the market with a radical product that requires people to think differently), and wholesale (attractive to governments or international NGOs that will take the responsibility for getting the innovation to "their" markets).

For many of us, the innovation is our comfort zone. The Seattle convening told us to step outside that comfortable place, and go to the user – the user as an individual, and the user as a community.

It's all about hearts and minds

As part of my preparation for the Seattle convening, I brought together a group that put leading business people whose fortunes owed much to their ability to scale alongside leading policy makers

DOUG STOREY, *Associate Director for Communication Science and Research, Johns Hopkins Bloomberg School of Public Health Center for Communication Programs (CCP)*

He looks like a down to earth sort of guy, ready to roll his sleeves up and get on with the work. Doug Storey played a significant part at the convening, not only with his address but also in helping to organize group discussions on social behavioral change.

The core of Doug's contribution was to report on a systematic review of social and behavioral change approaches that were community-based, rooted in interpersonal communication, and focused on groups, media and social marketing, or behavioral economics.

We all knew it, but Storey said it. Two-thirds of the research on social and behavioral change comes from the economically developed world, yet we seek solutions to challenges in the Global South. We hope and sometimes assume that findings translate from one context to another, but we don't know.

Doug Storey tapped into or set in motion many streams of thought that I suspect will continue from the Seattle convening into future conversations. He used the phrase "mass producing the personal," referring to the obvious tension inherent in trying to reach millions of people with products that appear to be tailored to the individual. He referred to the need to "rightsize," fitting scale strategies to the impacts we seek. And he was one of the first to mention the absence of data on cost.

HERD IMMUNITY: Can we do it better with network knowledge?

If we immunize 85 percent of a population against measles, the remaining 15 percent who do not receive the shot will also be protected. We call this herd immunity. When it comes to some diseases – mumps, for instance – we can get away with vaccinating just three-quarters of a population. Below this threshold contagion lurks.

Nicholas Christakis uses his network analysis to produce a different take on the same idea. If we do not know who is associating with whom, then we have to do a lot of inoculation. Since we don't want to take any chances, we play safe and draw a high threshold that we know from experience to be effective.

If we knew more precisely how members of a community were associating with each other, we could vaccinate just those people with the greatest potential to protect others, those whose networks were the most pervasive.

In this way, herd immunity thresholds might be greatly reduced, possibly to as low as 40 or 50 percent.

At left: A woman delivers vaccines house-to-house (Sokoto, Nigeria, 2009). Photo: Bill & Melinda Gates Foundation / Prashant Panjiar

who had transformed the experience of people using public systems. I wanted to learn about the technical aspects of the challenge, the metrics, the strategies, the economics and so on.

And I did learn several important technical lessons. But the most important lesson was that successful scale is all about changing hearts and minds. Spreading success means tapping into and making use of the instincts of the end user, and the people who are going to get the products or practice to the end user.

The emphasis on hearts and minds was repeated many times in Seattle. We have to connect at an emotional level with the people whose behavior we seek to change. Those people include not only the end user – new mothers living in impoverished conditions, for example – but also the people who sit between the innovation and the end user. These "in-between" people include intermediary organizations as well as those living in the same community as the end user, whether religious leaders, business leaders, the new mother's husband, mother, mother-in-law, sister.

If people believe in the innovation – if they form an emotional connection to the innovation – it will spread.

Greg Allgood works for Procter & Gamble, the fifth most admired company in the world, according to *Fortune* magazine. It is a multi-national with revenues that regularly exceed $80 billion. P&G employs over 100,000 people and it would be easy, Allgood told us, for them to be constantly looking into the upper echelons of the company for their direction. But every day, he said, they will encounter something in the course of their work that reinforces the mantra that "the consumer is boss."

Catching a healthy cold: contagion and networks

Scaling impact involves changing ordinary behaviors of individuals, and changing the norms in the groups to which individuals belong. One way to think about these changes is to see them as something "catching," a contagion – and to try to use the phenomenon of contagion deliberately for positive ends.

When new behaviors spread, they often do so through social networks, as Nicholas Christakis showed us. He made the simple point that networks can magnify any phenomenon. Moreover, they can do this quite effectively with little or no deliberate, external stimulus. We might call it natural contagion.

There is good evidence that obese people tend to know more obese people than non-obese people do. Happiness clusters, also – and so does loneliness. Is over-weight "catching"? Can I be "infected" with contentment?

Some of the clustering may not have to do with contagion. Rather, clustering of happiness, for example, may happen because of the "birds of a feather" effect: people are drawn to others like them.

But the explanation is not so simple as that. There are, argued Christakis, *domino effects* within networks, wherein the behavior of one person alters the behavior of the next, who has a similar effect on the next person and so on. Is this how the obesity epidemic is spreading?

Natural social contagion is happening right now. People in Brazil are having

smaller families. Nobody is trying to scale small families; it is just happening. Post-natal circumcision of boys has become the norm in the US, with a trend almost inverse to that in UK, where the practice is dying out. A whole generation of young people in the West have abandoned the purchase of daily newspapers.

I have selected, at random, a few of the dozens of significant changes in human behavior that have no single, obvious, organized impetus. In Seattle, there was a groundswell of opinion that finding out how different phenomena spread could be important to scaling impact.

Bill Novelli reflected back on his days as an advertising executive. He and his colleagues were so dependent on research, he said, for the simple reason that people's *descriptions* of their routine day-to-day behavior (their reports of moderate drinking, healthy eating, happy families, and industrious approach to life) don't always bear a close relationship to the reality of their behavior.

With the right knowledge it may be possible to **engineer contagion**, to use social networks as the veins into which behavior change is injected.

How do we mass produce the personal?

So when everything is stripped back, scaling impact means connecting with an individual, or the groups to which that individual belongs – but it means doing that a million or more times over.

Doug Storey had the right words to describe the challenge. He asked, "How do we mass produce the personal?" Small groups at the convening examined this challenge, exploring how we go small to improve intimacy, and also go big to maximize reach and scale.

Answers began to emerge. Kristin Tolle, whose genius manipulates micro technology to produce inventions that better serve family health, stressed that

NICHOLAS CHRISTAKIS,
Professor of Medical Sociology, Harvard Medical School

At one level, Nicholas Christakis' intricate maps of networks are beautifully simple. They remind us that people are connected, and the patterns of these connections change the way we think and behave. Straightforward, no?

But the real-world results can be surprising. Try this unexpected observation: the most successful Broadway shows are those where the troupe brings together a group of members who have worked together before and individuals who are new to the troupe. It may be that the mix of comfort and trust supplied by the old members is balanced by the challenge and new ideas supplied by the newcomers – and the result is success.

Nicholas has devoted his professional life to understanding how social networks work and pioneering ways of mapping them inexpensively, the platform to discovering how to manipulate them for good.

There are good grounds for believing that social networks influence health. Somebody with obese friends has a 45% greater chance of being obese themselves. Of course, it matters a lot whether that person is being influenced by the group (the domino effect in social networks) or whether he or she is just happier mixing with people of the same weight (the birds of a feather effect). Each effect demands a different approach to the reduction of obesity.

Network effects are indirect and contagious. If one person is good to another, he in turn is more likely to be good to someone else, and she in turn will be good to someone else. So person A's actions can affect person C via person B, without A and C ever meeting. Nicholas refers to this as *induction*.

He delivered his talk at a time when the world's media got interested in the reduction of the degrees of separation that separate us from everyone else on the planet, a reduction attributable to all kinds of social changes over the last two centuries, and accelerated by the internet.

The point is that connections matter. As Nicholas explained, it is not just what is happening around us that matters. The actual structure of the network also matters. He invited us to think about graphite and diamond. They are both made of carbon. Connect the carbon atoms one way: graphite, soft and gray. Connect them another way: diamond, hard and clear.

There are two ideas here, he said: first, that the properties do not inhere in the carbon, and second, that the properties are different, depending on the ties. Similarly, the patterns of our connections affect the properties of our social groups. The ties between people make the whole greater than the sum of the parts.

getting a lot of traction. In essence, we have to stop thinking about abstract target populations and start thinking about engaging with the real, live, intelligent people who make up those populations.

Context is king

It was Nana Twum-Danso who said it most clearly: **context is king**. You may have noticed that Nana is getting a lot of airplay in this synthesis. It's not that she said a lot, but several of her contributions captured key moments in the conversation. She was transmitting a lot of wisdom from the places where she works in Africa and Asia, the places that we need to reach if Millennium Goals Four and Five are to be achieved.

It's hard to think clearly about each of the contexts that impact at scale must reach. Each important difference between contexts is another step away from an easy, elegant solution. It often feels easier to carry on thinking in abstractions, rather than pushing ourselves to think concretely about context.

But there were many helpful ideas to guide us through the complexity. Simply acknowledging the regal nature of context is one step in the right direction. Another good step is to ask the five questions implied by the Yale "AIDED" framework – and to develop answers to those five questions with the help of the people we are seeking to benefit. Asking questions about the user group's engagement, desires, preferences, willingness to "pull" the innovation, and level of support should lead to a better alignment between what people in each social context want and will use, and the innovation we hope they will adopt.

The Yale questions are an excellent way into this problem, and they are rooted in a sound evidence base, but I wondered whether those five questions could be distilled even further. At their base, I think, is this one clear observation: there needs to be a clear and obvious answer

the consumer does not need to know how the "back-end" of a product works. Tolle can explain, if you are interested, how a chip in a contact lens can transmit precise information about blood sugar levels to a cell phone, but all the Type 1 diabetic child wants to know is that she doesn't have to prick her finger to take blood five times a day and she is probably going to live a longer, healthier life.

Many of us in Seattle were carrying our smartphones. Some of us used them to tweet our impressions, happily ignorant of how our 140 characters got from our little screen to an audience of over four million people. All we cared about was that we could participate in the

conversation. In fact, it may be too much to say we "cared" about it, because smartphones are now so mass produced – so widely available for consumers like the crowd in Seattle – that we took our ability to participate for granted.

And had some of us mislaid our smartphones, they would be easily distinguishable from the other 100 in the room by the way we had made this mass production personal with a picture of our loved ones on the screensaver or with our particular array of applications.

There are other words for describing the challenge of mass producing the personal. The phrase "intimacy at scale" is also

when the people we seek to reach want to know, "What's in it for us?"

Answering that question means allowing the context to adapt the innovation, letting users mold it to their local requirements. Such trust and flexibility on the part of the catalyst means it – the funder, or the intermediary organization – needs to check in frequently, find out how things are going, solve problems, and move to the point where the innovation will run free.

Adaptability, in turn, implies communication. It is clear that we cannot tell people what to do. It is fruitless to try to impose uniform solutions. And it is becoming obvious that we cannot swoop in and collect data at fixed points in time, hoping that they will magically contain the right answer. We need to converse, and keep on conversing.

Of course, it's not as easy as all that. We need to welcome adaptations of an innovation for each context. But it's much harder to work out the point at which local adaptations diminish or demolish the value of the intervention. For instance, exclusive breastfeeding can reduce infant mortality – but what if the local context removes the word "exclusive"? Where does the line get drawn? How can we help users to keep the effective core of the innovation intact, even as they adapt it?

Lessons from quality improvement

There may be much to learn from the world of quality improvement, a world that concentrates less on doing new things than on getting the most from existing activities.

Much of the language of quality improvement was used at the Seattle convening, such as "learn, test, fail, and improve," or "the way we learn." Don Berwick reported directly from the quality improvement world when he said that "peer learning beats third-party learning every time."

Conclusion: The grounds for optimism

There is no template emerging here. The convening produced no guidebook that will tell us precisely how to achieve our goals. But there were grounds for optimism. We can use what we know about designing with scale in mind, appealing to hearts and minds, and paying attention to local contexts.

Paradoxically, I find grounds for optimism in the fact that we *know* that we have to learn to act differently.

We have to begin with idea of scale, not the thing we are trying to scale. We need to start off with the countries, communities, families, and individuals who will benefit; we need to get as close as we can to their minds, their motivations, their habits, and their expectations. We need to be clear about what is in it for them, as well as for us. We have to embrace uncertainty and make it a part of the way we work.

We need different approaches to strategy. We have to start thinking Kia or Tata and give up on Cadillacs and Mercedes. We have to put the idea that the user is boss at the root of planning and action. Rightsizing the scale strategy is going to become routine.

And we will need the best expertise we can to help us mass produce the personal. Intimacy and scale are not two ends of a spectrum; they are intrinsically linked. Individual behavior change and group change are not competing strategies; they are bound together.

Only a fool would pretend that there is not more to work out. For instance, this question of "what is core and what is adaptable" is easy to ask but hard to answer, and it deserves more scrutiny. It is to this and other emerging challenges that ran through the convening that I now turn. ●

### MARKETING: Moving our minds from push to pull

It can be difficult, when the room is full of people whose role is to stimulate impact at scale, to move the discussion away from how to push innovation into a resistant community (which is exactly the frustration that so many of the convening's participants face in their usual work) towards encouraging the pull from an expectant population that becomes the vital ingredient in all scale-up successes.

Rajeet Pannu managed to shake our group out of our orthodoxy. As we discussed how to scale Chlorhexidine, we got stuck on why people persist in choosing a range of ineffective and sometimes dangerous products for cleaning a baby's umbilical cord when Chlorhexidine appears from a range of trials to be effective.

Rajeet pointed out that any consumer choice may be influenced by marketing. In any context where individuals or groups must decide among options, advertisers can influence that choice.

The marketing expert will focus less on the technical benefits of the product, and more on its emotional appeal to the consumer. It was noticeable, for example, that Gentian Violet, one of Chlorhexidine's competitors, was appreciated by its users for its warmth and for its ability, thanks to its dark purple color, to signal action.

Big pharma, much maligned, is expert in addressing these challenges of marketing and persuasion – and may have much to contribute.
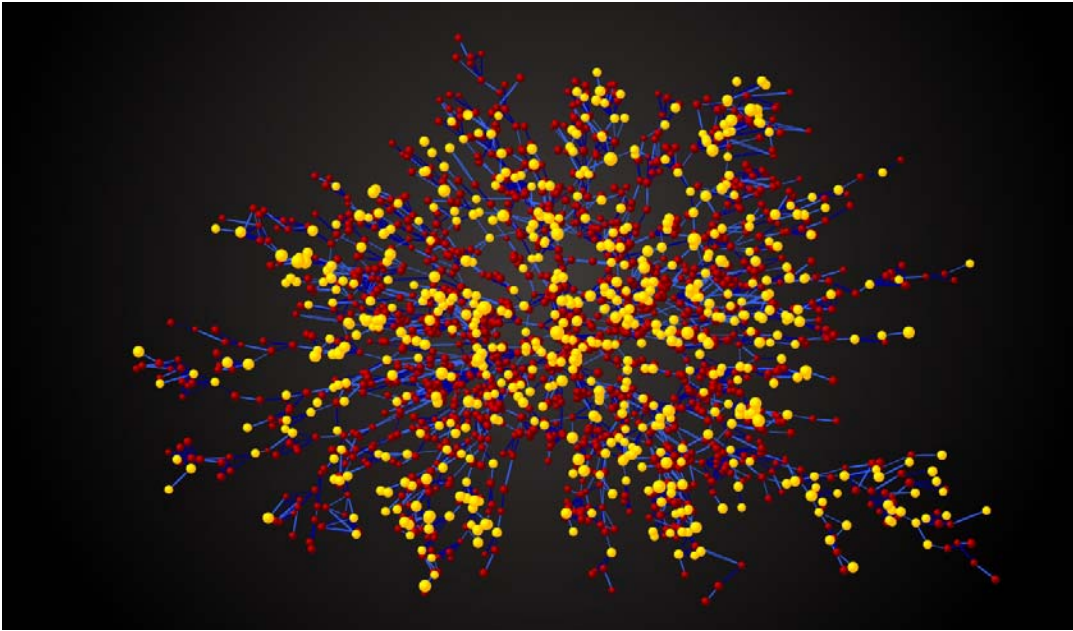
Obesity clusters in social networks of friends, co-workers, and families. The questions are: what causes this clustering? And can we turn it to our advantage in making an impact at scale?

Image: NA Christakis and JH Fowler. 2007. "The Spread of Obesity in a Large Social Network Over 32 Years." New England Journal of Medicine *357: 370-379.*

IV. Catalysis

Lasting impact at scale means creating chain reactions. A common vocabulary for scale, a radical revision of the "toxic" style of sequential evaluation, better theories about what can be scaled – these may be the sparks we need to create chain reactions that will cascade as users "pull" and we stop "pushing"

The Bill & Melinda Gates Foundation is a catalyst, as Jeff Raikes said – a catalyst for discussion, thinking, learning, and action. But they cannot be the only spur. This idea of catalysis applies to us all. What can I do as a scientist to spark development of ideas? What can I do as a practitioner to spur a different mode of action? What can I do as a grantee to deliver not only what I promised to deliver to the grantor, but to use the grant as a platform to do more?

Perhaps many of us at the convening worried, in Donald Rumsfeld's memorable phrase, about the "unknown unknowns" – the things "we don't know that we don't know." However, some requests for particular answers and activities – particular types of catalysis – came through clearly, and probably

warrant being part of the work that will follow from the convening.

I draw particular attention to the need for a common language. Many participants sensed, I think, that we need more precision in the language we use in our future conversations, and we aspire to a shared way of thinking about the challenge of impact at scale. There is a strong demand for frameworks and tools, and indeed the contribution of Yale was seen as a welcome step in the right direction. And we are all coming to realize that the monitoring and evaluation paradigms in which we have been thoroughly trained are probably not fit for the purpose of scaling impact.

Common language

Is it only super smart people who gather together to discuss something they have yet to define? Towards the end of the first day of discussion, the scattered questions about what we mean by scale began to build into a chorus.

There are dangers of over-definition. The words we use must flex and be useful in many contexts. We have to be able to adapt them for our own means. But there are dangers with under-definition, too, when people start to use the same words to mean very different things. Under-definition produces a false and temporary sense of concurrence that inevitably breaks down when the agreement is put into practice.

So our efforts to find common language should be liberating, not restrictive. I aim to get the ball rolling here with some reflections from the convening about what we mean by scale. I then will try to spark some interest in looking again at what I will call Everett Rogers' words: "S" curve, dissemination, diffusion and, of course, innovation. All of these

important words are now used in ways that differ from the way the late Rogers, the ghost in the room, originally used them.

Scale vs. impact at scale

If I heard the conversation correctly, there is much that is common in the way we think about scale. We generally adopt what I call a pluralist stance, so we recognize that scale can be small – reaching every child in a school or a community, for example – and it can be big, reaching every child in every school or community in a region or country.

Toward the end of the convening, there was concord that scale was not the outcome we sought. Our objective is not scale; it is impact. The epidemiologists in the room were at pains to point out that reaching 80 percent of a population is worthless if impact depends on reaching the 20 percent that missed out.

More work is needed on how to classify and name what is being scaled. I have skated around this challenge so far, referring to "innovations" or "interventions." Occasionally I have talked about "products" (such as Chlorhexidine), "practices" (such as exclusive breastfeeding), and "platforms" (such as community health workers) – all words that have enjoyed some utility within the Bill & Melinda Gates Foundation.

Once we say that we are not interested in scale, but rather *impact at scale*, then we need to clarify what types of impact we expect. There are at least four questions about types of impact. First, how widespread is the impact compared to the spread of the intervention? For example, are there public health effects, where the gains spill beyond those individuals or groups immediately benefiting from the innovation?

Second, how self-sustaining do we expect either the scaling or the impact to be? And when do we expect the impact to

become sustainable: at what stage should the external stimuli be withdrawn?

Third, we need to define more clearly the dynamism of scale. Do we always expect the innovation to continue to evolve?

And finally, our understanding of impact needs to extend to side-effects. Unintended side-effects – both positive and negative – were hardly mentioned in Seattle, but they will be an inevitable part of impact when ambitious programs are taken to scale.

Everett Rogers' words

The sociologist Everett Rogers coined the words innovation, dissemination, diffusion, and the "S" curve. These now-popular terms sit at the heart of his 1962 book *The Diffusion of Innovations*. These words were used frequently – but also variably – throughout the convening. I wondered whether Rogers would have recognized the way his work was now interpreted, or whether a man so committed to continuous development of ideas would have cared that his words

had now evolved to mean so many different things to different people.

Rogers found it helpful to distinguish between active efforts to encourage people to take up an innovation – which is what he meant by dissemination – and the uncontrolled spread of the innovation that continues well beyond the initial impetus, which he defined as diffusion. Interpreting innovation in a simple way, as an idea applied in practice with people for whom it is new, also aided my thinking.

Summary

Betsy Bradley, Doug Storey and I reflected on the merits of tighter definition prior to the convening, but felt that at this early stage in the conversation, narrowing the definitions would be a hostage to fortune. But in future convenings, more might be done to find agreement about what we mean about a core set of words. I am attracted to the prospect of setting up a wiki to initiate a broad reflection on this issue.

POSITIVE DEVIANCE

A recurring theme, no doubt prompted by some of Betsy Bradley's research on the subject, was the potential of positive deviance. Some people don't walk in the same direction as the rest of us. They take a different path. It's uncomfortable, sometimes annoying, and frequently unproductive. But when it pays off, it really pays off.

Several of the undercurrents of the Seattle conversation flow into the idea of positive deviance. This concept demands that we learn from others. It urges us to turn to people who solve problems in a local context. And it requires us to embrace people who go against the grain.

Positive deviants operate at many stages in the impact at scale journey. Some are bucking the trend in their home communities: they are the mothers who insist on feeding their children four times a day when others think two is sufficient, the mothers who find ways to cook foods thought by others to be unsafe for children. Others are looking at invention from a completely different angle: they are the ones putting blood sugar measurement into a contact lens, for example.

As this conversation develops we shall be keeping a watchful eye for potential positive deviants who challenge the orthodoxy. And we shall encourage a critical eye on our own routine responses to common challenges.

Of course, the words only take us so far. We have to work out whether, as we put our agreed-upon words to use in forming new ideas, this common language can create common ways of thinking that lead to unforeseen breakthroughs in the scaling of impact.

Putting the "L" back into MLE: New approaches to monitoring, learning, and evaluation

After the convening, Philip Setel, from the Bill & Melinda Gates Foundation, brought together participants who were involved in monitoring, learning, and evaluation of attempts to scale impact. Our minds were addled by over-stimulation, excited by the path that lay before us, and daunted by Don Berwick's call to arms about the toxic effects of sequential evaluation.

The conversation whirred, not always coherently, until someone, almost certainly Wolfgang Munar, said what we hadn't been able to articulate: we had to put the "L" back into MLE – the learning back into monitoring, learning, and evaluation. We were monitoring (probably too much and possibly in the wrong ways) and we were evaluating (almost certainly in the wrong ways). Either way, we certainly weren't *learning* what was needed to better scale impact.

With the benefit of hindsight, this insight is not so surprising. We have been collecting too much data. We have jimmied methods designed for other purposes awkwardly into the scale space. Those methods are responsible for the linear sequencing of evaluation against which Berwick railed. The approach taken has been well intentioned. Little was known about scale, and the MLE pioneers quite reasonably wanted to check existing evidence or get new data, quickly.

Challenging sequential evaluation

But the questions we need to ask in the process of scaling impact are so different as to require a new model. Compare, for example, the mindset of those of us trained in sequential evaluation (and we are not a minority group, by the way) with the approaches that will be demanded in the world of scale.

Interventions are typically designed by scientists in order to reduce risks that lead to poor outcomes. In the future, intervention design must also involve adopters, and it must reflect the potential to tap into existing normative behaviors. Epidemiological and longitudinal data about *need* has driven innovation, but it must now be extended to *demand* for innovation.

"Fidelity of implementation" has been the watchword in the context of evidence-based medicine, but adaptation that can make the intervention acceptable in a local context while still protecting the core will become a staple in future implementation evaluations.

Experimental evaluation has been the gold standard for assessing outcome, but additional methods – methods that produce real-time feedback – will be

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BETSY BRADLEY, *Professor, Yale School of Public Health, and Director, Yale Global Health Initiative*

It must be a tough ask, even for a Yale professor: analyze a couple thousand articles, find out how groups figure in large-scale change, and then sum up the findings in 20 minutes in a format that will appeal to a broad-based, well-informed and quite impatient audience. But this is what Betsy Bradley masterfully delivered.

The primary focus of her talk was the Yale framework, which is described at many points in this synthesis. But emerging from that framework were a series of practical steers for effective action.

Top of the list: start with the user, not with the innovation. A persistent barrier to scale, observed Bradley, is to conflate *need* and *want*. We may think others need a particular solution; but do they want to use it? We have to ask communities whether they are open to using the innovation. They have to see the innovation as acceptable and advantageous, and that will demand some adaptation.

We don't just "start with the user" once in a scale-up process. We do it many times over as we find the mechanisms that are critical to each scale-up endeavor. The users change the innovation, while the innovation changes the user. And this complicated dance of development occurs in slightly different ways from one community to another – so in each case, we start with the user again. And again.

Since people attach themselves to groups and groups exist in societies, with their own norms, political, regulatory, and economic frameworks, scaling impact demands strategies that work at many levels.

And the catalyst has only so much control over this process. Indeed, the catalyst's role in devolving the innovation is precisely to anticipate, plan for, and welcome the moment it relinquishes any involvement.

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necessary to estimate impact at scale. We have looked to systematic reviews, ideally of many different experiments, to decide what works; but I suspect that other methods, perhaps similar to business school case studies, will be more effective in getting us to scale.

We are being asked to evaluate a new phenomenon. I don't think I was alone in coming to the Seattle meeting thinking that estimating scale is just a matter of doing more of the same. Isn't calculating impact at scale just a bigger version of calculating impact of an intervention in an experiment? Unfortunately, no.

Scale is qualitatively different as well as quantitatively different. The impact being evaluated is not the same. It extends, for example, to public health effects where benefits to the person in contact with the innovation spill over to her network. The interaction between the innovation and the outcome is different: it is dynamic and two-way, with the innovation potentially altering behavior and behavior ideally altering the innovation.

In the past, evaluation has mostly been a job for scientists, especially when it comes to the high-end questions of whether an intervention is worthy of scarce state or philanthropic funds. This is not a tenable state of affairs when it comes to scale. Many people on the supply chain from catalysis to impact will play a role.

And this brings us to another challenge: efficiency. At present, scale maestros have to fight their way through mountains of data, the use for which may long since have been forgotten. It should be within our grasp to work out collectively how to collect *less* information and to do more, much more, with it.

We ended the post-convening meeting on MLE by talking about role differentiation. In the rush to tool up with ideas, we have sometimes forgotten who is doing what and why.

I very much hope that future convenings in this series will pursue the question of

how to re-design MLE for scale. The litmus test in that work should be the "L" in MLE. We must be clear about the learning points for each set of data we collect. Ideally, we should be clear about predicting how that learning will alter future efforts to scale.

Potential useful catalysts

In addition to agreeing the need for clearer structures for MLE, a number of other frameworks and tools were identified in the convening as being potential stimuli for future success. I could weave these proposals into a narrative, but that would be misleading. They weren't integrated into our discussions; rather, from time to time over the two days, participants would remind each other that "we don't know how to do X" or "we are handicapped by the lack of Y." So instead of a narrative, I offer a list of what I heard.

It could be helpful to have some parameters around what is and what is not scalable. It is evident now, after 200 conversation-days, that innovations have to be simple – but how simple? Is there, for example, a theory that relates simplicity of the innovation to the volume of impact? More prosaically, participants asked whether community health workers, a platform that has been well tested and long implemented, could be counted as an innovation, or whether Chlorhexidine really could be said to be effective, and therefore worthy of scaling. We need some rules and maybe a simple taxonomy to help us answer these questions.

There was also much in the conversation about how changes in methods in other fields could contribute to the chances of scale bets paying off. For instance, epidemiologists should be able to extend their methods to inform demand as well as need; and keepers of databases about "what works" should be able to add community readiness, system readiness, and scalability to their standards.

One of the biggest holes in our knowledge base is economics. We don't know much about even the unit cost and start-up costs of competing scale impact options. Calculating opportunity cost and return on investment seem a very long way off. Understanding how economics change in the context of scale has not yet, as far as I could judge from the convening, been contemplated, at least with respect to family health impacts.

Readiness is a word I heard many times. Is the innovation ready for scale? Is the context ready for the innovation? Is the catalyst ready to do everything it will need to do if the innovation is to be given an even chance? Are the people and organizations on the supply chain ready to make their contributions?

These are empirical questions that can be studied and answered to produce results that can be translated into tools that are useful to the field. Several tools are in preparation, and a useful function of future convenings would be to test them with the people who will use them, possibly applying the five tests embodied in the Yale framework.

I have said enough about the benefits of a common language. I am not an unbiased observer on the matter, but I am confident that there was a groundswell of support for a common way of thinking.

At the same time, there was an unease about relying on a single framework. Poonam Muttreja observed that a framework is optimal when it acts as a lamp, not a lamppost: it should shed light on a problem, but we shouldn't find ourselves holding onto it for support.

A final spur would be a place, a forum, where ideas could be exchanged, a space for more blogs and tweets, a wiki maybe, a context to share case studies about what works, and what doesn't work, a space to deposit our learning.

Letting go: Devolving

Scale is about *pull,* not *push*. It may start with an external impetus, but success depends on rolling a ball that will run out of the grasp of those who started it rolling. This is the difference between what Rogers called dissemination (the push) and diffusion (the pull). The fifth component in the Yale framework is "Devolve," where those who first take up the innovation spread it through their social networks. This is a form of natural contagion.

There is no debate about the necessity of devolving, of letting go, of giving into the pull and ceasing the push. Everyone agrees this is exactly what happens in the process of successful, sustainable, lasting impact at scale. But in 200 conversation-days, we scarcely talked about how to do this. We talked a lot about assessing, innovating, developing, and engaging – the four other components of the Yale AIDED model. It is perhaps no coincidence that these four components are the ones that give a large role to the external stimulus – in other words, to us. But we ran out of ideas when it came to "devolve." We were too reticent.

If we are to make progress on scaling impact, we will have to overcome our reticence. ●

GARY DARMSTADT, *Director of the Family Health Division, Bill & Melinda Gates Foundation*

Going to the convening was a bit like stepping onto a cruise ship in Seattle harbor. You didn't quite know where it would go, but you could bank on the trip being interesting. Gary Darmstadt was the ship's captain; he came on deck every now and then to tell us where we were stopping next. His steadying hand nearly led me to overlook his own groundbreaking research prior to joining the Bill & Melinda Gates Foundation.

It was Gary who started off the twitter hashtag #scaleimpact that generated 568 posts reaching out to 4.7 million potential readers over the two days of convening, and which were linked to a series of blogs at www.gatesfoundation.org/global-health/Pages/scale-impact.aspx. The convening has sparked a significant social network.

The captain set out the objectives for our voyage. The Bill & Melinda Gates Foundation was engaging with global experts to work out how to achieve impact on global family health at scale. It was crowd-sourcing ideas, recognizing its limitations as an organization, and looking for ideas that were "actionable."

Gary recognized at the outset that the job was not going to get done in a couple of intense days gathered together in Seattle, and that the Foundation is in this for the long haul.

He rounded the convening off with a commitment to continue the conversation at meetings in India and Ethiopia in 2012 and 2013, and to support the development of frameworks and tools that can be helpful to those engaged in scaling impact.

THE FIVE CLEANS: What if one innovation undermines another?

One of the great public health breakthroughs responsible for a significant improvement in human health has been to get everyone, but particularly medical workers, to wash their hands.

Ignaz Semmelweis, one of a number of people to whom this brilliant idea can be attributed, died in a mental hospital of despair partly brought on by the denunciation that comes from being a positive deviant. A century and a half later the world is still working to scale and sustain his ideas.

Anthony Costello reflected on how one innovation – for example, getting midwives or others attending the birth of a mother to clean the severed umbilical cord with Chlorhexidine – could potentially undermine another.

A highly successful scale-up venture by the World Health Organization is the Five Cleans. Launched in 2009, this campaign seeks to improve hand hygiene among health care workers. It simply asks that they scrub their hands before touching a patient, before antiseptic procedures, after being exposed to body fluid, after touching a patient, and after touching the things around a patient.

In sending out a message that Chlorhexidine can clean a severed umbilical cord, it is vital that those caring for the mother and her newborn child do not come to see the innovation as a substitute for the Five Cleans. In fact, perhaps integrating the spread of Chlorhexidine into the Five Cleans campaign could enhance both, and multiply the potential to reduce the six per cent of preventable deaths in the first days of life attributable to infection.

V. The conversation continues

With 21,000 children under five dying every day, participants said it was time to act – to act with boldness as well as humility, even in the face of uncertainty and imperfect information. Our continuing conversations can inform the "big bets" that urgently need to be placed

Seattle was just the beginning of a longer, larger conversation. Perhaps there was an outside chance that the convening would have resolved all of the major challenges and given a clear mandate for future action. Perhaps it was more likely that the event would have proved frustrating and a waste of people's time, leading to a radical re-think about how or even if to progress. The end result was somewhere between the two.

Throughout the two days my colleagues took careful soundings on how participants were finding the convening. Afterwards, an online questionnaire collected more data. I begin this concluding section with these data: the users' perspectives on the innovation that was the convening.

Based on this information and on the primary themes emerging over the two day conference, I will then propose some potential ways forward. I am not, I should stress, speaking for the Bill &

Melinda Gates Foundation, nor will I try to restrict my observations to what the sponsors of the convening should do. I view each and every one of us who came to Seattle, and those who will join this conversation as it continues, as a potential catalyst with a role to play in scaling impact. And I am mindful of the many thousands of people who did not come to Seattle who can play a vital role also. My appeal for action is broad.

Participants' reflections

Everyone gave up valuable time to contribute, and not everyone felt they got value from the opportunity. There were times when the group discussions were convoluted and unclear. Some of the participants had a sense that the Yale framework was an innovation that was being imposed on us, the users – which, if true, would be a great irony, since the message of Betsy Bradley and her colleagues was to start with the user

group, not the innovation. Some of the reporting was interesting, others less so. And, inevitably, there were speakers whose message individual participants either adored or loathed.

On the other hand, nearly everyone came away thinking that the convening was a big deal. The presence of Melinda Gates, and her comprehension of the challenge and empathy with the mothers and children we seek to support, was universally welcomed. There was widespread agreement with Don Berwick's observation that just holding a conference of this magnitude was to send out a signal that urgent action is required. I don't think I was alone in listening to Don and then to Jeff Raikes and thinking that this was a game-changing event.

There was some interest in more research, particularly around social behavior change, which many believe to be pivotal to future action. There were several calls for tools to help get the job done, better metrics, clearer indications about what is scalable, predictions about when the links in the supply chain are ready, and more. I suspect that the science of scale may sometimes over-focus on big ideas about reaching the masses, but those who are looking to science for practical help and

advice are mostly searching for local solutions to specific but generalizable challenges. That is, I heard more demand for practical, usable checklists than for overarching conceptual frameworks.

There was significant demand for more information about what works, not in the form of the results of experimental trials or systematic reviews, but in case studies that tell a story about success or failure, with implications for future practice. I have alluded in these pages to some of the potential narratives, but, as a result of the Seattle convening, I now know of many more.

In Seattle, we heard some new terms for collective action: solution leverage, crowd-sourcing, integrated innovation, functional collaboration. No matter what we call it, it seemed to me that most people left at least acknowledging and in many instances lobbying for a collective response to the challenges that we face. I don't reckon that people want a repeat of Seattle, but they are excited by the prospect of facilitated discussions around real-world problems for those who seek to stimulate lasting impact at scale. There was a sense of wanting to get our teeth into something real.

A common call was to shift the conversation into the Global South. We have been talking about Africa, Asia, and other places where family health is most compromised. The demand was to confer in these places, to get much closer to the users of the potential innovations. Most participants were struck by how little of the actionable evidence is coming from the Global South, a problem that can and should be resolved rapidly.

Above all, there was a mood to transfer the energy created in Seattle to seats of power in Africa, Asia, and South America, to catalyze government, intermediary organizations, the business community, and civil society, and to encourage them to play a full role in the continuing conversation.

Act now, bet big

Perfection is the enemy of the good. We can keep on talking, and getting better at the job, and learn as we go – but sooner rather than later, we have to act. The alternatives to urgent action are bleak. This is what I heard people say in Seattle.

Much current activity aimed at scaling impact is timid. This reflects, no doubt, the many unknowns. Most successful scale stories involve big bets and informed wagers, but even the successful endeavors were usually hampered by significant gaps in knowledge at the outset. It could be a good success if financial catalysts – governments, international bodies, and philanthropies – were each inspired by the discussions to back a couple of larger initiatives.

If the catalytic organizations are minded to do so, there is plenty of information from Seattle to help. I have prepared in an adjacent publication some lessons that might be applied, so I will do little more than list them here; but if I were running the UK Department for International Development, or the World Bank, or the Bill & Melinda Gates Foundation, and I decided to invest heavily in a couple of promising scale impact initiatives, I would be irritated if they:

- Didn't acknowledge that context is king
- Started with the innovation and not the user
- Overlooked the fact that the consumer is boss, bearing in mind the consumer might be a mother, a child, or a person helping either
- Were designing a Cadillac and not a Kia
- Were solely based on invention and didn't also try to improve existing health practices, platforms, or products
- Were based on need data and not also on good estimates of demand
- Didn't examine social networks for their potential for positive contagion

- Were focused on just individual change or group change when success will require both
- Failed to rightsize the scale strategy to the impact at scale being sought
- Left out of the design process experts who will boost the emotional properties of the innovation to which users can relate
- Forgot that people will want to personalize the innovation
- Used indirect training mechanisms or over-relied on incentives.

I am sure participants and other readers will want to adjust and add to this list, but it seems to me that these are some clear steers for future action.

Talk for action

If one form of catalysis is a handful of informed big bets, another is a continuing conversation to inform those big bets. By design, this will be "talk for action."

I am speculating when I propose that the major catalysts should bet big; clearly, they will decide for themselves. I am confident, however, that there will be support to continue the conversation started in Seattle, and that those of us who attended that convening will be encouraged to steer the dialogue toward actionable knowledge. How might we do this?

It is clear from Seattle that forms of collective problem-solving (crowd-sourcing, integrated innovation and functional collaboration) should sit at the heart of the proposal. More work is required to define the problems for which we seek solutions.

Using the Seattle convening as a platform, there is potential to develop a common language, for ways of thinking that will facilitate the exchange of ideas, and for better definition of the concepts to impact at scale, such as innovation and diffusion. Being sure about what we mean

by scale, about the objective to which we all aspire, is essential. A wiki open to all contributors might help, perhaps supported by a smaller expert panel.

Space is needed to keep the conversation going before meetings in India and Ethiopia this year and next. As urged by Neal Baer, I have begun to collect stories about people's experiences of working to scale impact. Some of these stories are substantial, some less so. I wonder whether there should be a forum on the web to collect interesting narratives.

These could form a welcome supplement to the blogs that are being posted at www.gatesfoundation.org/global-health/Pages/scale-impact.aspx, which help to keep momentum behind knowledge development and transfer. The Twitter hashtag #scaleimpact has been less used since the convening and there are arguments for encouraging it to trend.

I am more certain about the benefits of collecting case studies about success and failure in attempts to achieve impact at scale. I sensed that the Seattle participants were thirsty for more empirical examples of the challenges we face, and more connection to the contexts in which change must occur.

I also want to make the case for groups, either sub-groups from Seattle or groups specially formed, to work on two specialist areas. The first should look at the problem of sequential evaluation. There is a need to think about the new palette of evaluation methods being urged by Don Berwick, and to work out how we can put the "L" back into Monitoring, Learning, and Evaluation.

The second should examine frameworks, tools and metrics that might be useful across the constituencies of people working to scale impact. There are groups of academics, some present in Seattle, working away at this challenge. I propose a different tack to complement the academic work. Why not take a bit of our own advice and start with the user? How about taking a few practical challenges

facing those working to achieve widespread improvements in family health, ideally working in Africa, Asia, or South America, and then try to devise some cheap, simple, effective, innovative tools to overcome those challenges?

Reconvening

I have proposed two ways to build on Seattle: first, encouraging funders to place some big bets; and second, continuing a conversation that leads to actionable knowledge. With a little smart thinking, these two could be linked. Most participants at the convening, and many of those interested in making further contributions, are more interested in tackling real-life challenges, such as those thrown up by big bets, than talking in the abstract.

It is proposed to reconvene in Ethiopia in 2012 and India in 2013. These meetings should be opportunities to report on progress and to draw firmer conclusions about how to achieve lasting impact at scale. They will be an opportunity to expand on, and to have more confidence in, the summary of lessons learned that accompanies this synthesis. In order to make these achievements, more time might be put aside for facilitated discussion, and for more reflection on local context and user adaptation.

We should not miss the opportunity in Ethiopia and India to inform the field, to energize catalysts, and to change the hearts and minds of people who can make a difference to global family health – in government, in international NGOs, and in intermediaries – but it should not swamp the practical work that also clearly needs to be done.

The details will be worked out in the months to come, and will reflect participants' responses to the convening and to this synthesis. The next stage of the discussion begins now. I hope it will lead to greater clarity and confidence when we reconvene in Ethiopia and India this year and next. ●

TALK TO ME ABOUT HOW TO DO THIS BETTER

I have now told you what I heard in Seattle. The conversation was not all-encompassing, and no doubt there was much that I misheard or overlooked. Whether you are reading as a participant at Seattle or as somebody ready to join this continuing conversation, we are keen to hear your reflections, on what has been said, on what needs to be said, and on how we can better structure the exchanges in Ethiopia and India.

If you have views, please email or send a blog to me, or submit a tweet to #scaleimpact. In time, I will organize these contributions to fill what might otherwise be a hiatus before we reconvene.

Our goal here is simple. Nobody knows how to scale impact. If they did, we would be getting on and doing just that. Many people have part of the solution. I want to help to connect those people and, to use Jeff Raikes' words, to leverage their solutions.

And the ultimate purpose? To find ways of scaling impact on maternal and child health around the world. If we can help the Bill & Melinda Gates Foundation to make smarter investments, all well and good. But that should be a by-product. What matters first and last is the better health of mothers and their children.

Michael Little,
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Participants

Kesetebirhan Admasu is a medical practitioner and is the State Minister of the Federal Ministry of Health, Ethiopia.

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Greg Allgood is the director of Procter & Gamble's Children's Safe Drinking Water project. Greg was a panel member at the convening.

Nava Ashraf is an associate professor in the Negotiations, Organizations, and Markets Unit at Harvard Business School. Her research tests insights from behavioral economics in the context of development projects.

Thomas Backer is a psychologist and runs the nonprofit Human Interaction Research Institute, which uses behavioral sciences strategies to help other nonprofits handle innovation and change. He is also an associate professor of medical psychology at the UCLA School of Medicine.

Neal Baer is a pediatrician, television writer and producer. He is executive producer of the television series *A Gifted Man*, and was executive producer of *ER* and *Law & Order: Special Victims Unit*. Neal was a panel member at the convening.

Jean Baker is director of the Alive and Thrive program, based in Washington D.C., designed to improve infant and young child feeding and nutrition in Bangladesh, Ethiopia, and Vietnam.

Vinita Bali is the managing director and CEO of Britannia industries, a publicly listed Indian food company.

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Donald Berwick is the administrator for the Centers for Medicare and Medicaid Services (CMS). He oversees Medicare, Medicaid, and Children's Health Insurance Program, which provide care to nearly one in three Americans. Donald was one of the plenary speakers at the convening.

Sarah Blake works at Global Health Visions, a consultancy working on issues related to the health and wellbeing of women and children in developing countries.

Kirsten Böse runs the Global Program for Knowledge Management at the Johns Hopkins Bloomberg School of Public Health Center for Communication Programs (CCP).

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Sandra de Castro Buffington is director of Hollywood, Health & Society, a program of the USC Annenberg Norman Lear Center that provides information for health storylines to the entertainment industry.

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Maureen Corbett is vice president of programs at IntraHealth, an NGO that aims to empower health care workers around the world.

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Leslie Curry is a scientist at Yale's Global Health Leadership Institute, School of Public Health, and School of Medicine. Leslie worked with Yale colleagues on the AIDED model presented at the convening.

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James Dearing is co-director of Kaiser's Center for Health Dissemination and Implementation Research. He is principal investigator for a BMGF project to develop measures of diffusion system readiness and capacity for global health.

Christopher Elias is the president of the Seattle-based non-profit organization PATH, which aims to improve health by advancing technologies and encouraging healthy behaviors.

Katie Elmore is vice president of communications and programs at Population Media Center (PMC), an organization that aims to encourage positive behavior change through radio and television dramas on family and health issues.

Claudia Emerson works for the McLaughlin-Rotman Centre for Global Health where she co-leads the Ethics Pillar, which encompasses the Ethical, Social and Cultural Program for the Grand Challenges in Global Health initiative of BMGF.

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David Guilkey is professor of economics at the University of North Carolina at Chapel Hill, and a fellow of the university's Carolina Population Center. He is the project director for the BMGF-funded Measurement, Learning and Evaluation Project.

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Hanson Hosein is director of the Master of Communication in Digital Media program at the University of Washington, and is also a documentary-maker.

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Peter Hovmand established and directs the Social System Design Lab at the Brown School of Social Work at Washington University in St. Louis, where he uses system dynamics to evaluate community-level interventions.

Lisa Howard-Grabman is a consultant working with Training Resources Group, Inc., where she designs and implements community engagement programs in Africa, Latin America and Asia. Lisa presented on a panel discussion at the convening.

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Bola Kusemiju is the deputy project director and director of operations for the BMGF-funded Nigerian Urban Reproductive Health Initiative (NURHI), in partnership with the Johns Hopkins University Bloomberg School of Public Health Center for Communication Programs (CCP).

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Patrice Martin is the co-lead and creative director of IDEO.org, a nonprofit organization started by IDEO to address poverty-related challenges through design.

M. Rashad Massoud is a physician and the director of the USAID Health Care Improvement Project. He is also senior vice president of the Quality & Performance Institute at University Research Co., LLC. He presented some of USAID's results during Donald Berwick's keynote presentation at the convening.

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The Social Research Unit at Dartington helped to facilitate the Seattle convening and drew together this synthesis. Ali Abunimah, Dwan Kaoukji, Michael Little, and Louise Morpeth contributed to and recorded their impressions of the convening. Michael Little and Beth Truesdale prepared this synthesis.

Bill & Melinda Gates Foundation Participants

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David Isla, Katy Bumpus, Jae Anderson, Marlo Hartung and Liane Fernyhough are program assistants in the Global Health Program and provided event assistance.

We have done our best to represent all participants' names and activities faithfully, but if we have made a mistake on yours, please let us know at: michael.little@dartington.org.uk.

Achieving Lasting Impact at Scale:

Behavior Change and the Spread of Family Health Innovations in Low-Income Countries