How to Identify and Implement Solutions in a Landscape of Complex Global Problems

Implementation Workshop Report

Columbia University
New York, NY
June 7–8, 2018
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Workshop Purpose

On March 7–8th, 2018, Columbia Worlds Projects convened more than 30 leaders from government, non-governmental and philanthropic organizations, the private sector, and academia to take a collective step back and discuss—in the context of today’s many pressing global problems—best practices for selecting problems, identifying and implementing solutions to those problems, and defining and measuring solution success.

The workshop represented a formative step for Columbia World Projects, a pioneering initiative launched by Columbia University President Lee Bollinger. The Initiative’s goal is to tackle major global problems through partnerships between academia and entities outside of the academy, transforming knowledge into concrete consequences benefitting humanity. Columbia World Projects reflects a core belief that solving complex global problems demands working across a range of backgrounds, disciplines, and institutions to identify, design, implement, and evaluate solutions.

The workshop’s primary goals were to:

1. Bring together leaders and experts from a broad range of backgrounds who have been engaged in tackling global problems from different perspectives, and
2. Invite participants to share lessons learned on best and less-explored practices with respect to:
   - identifying problems to tackle;
   - identifying and implementing solutions for selected problems;
   - defining and measuring success; and
   - identifying roles for different stakeholders.

This report summarizes key themes that emerged from the workshop. It will serve as valuable input as Columbia World Projects identifies and develops projects that meaningfully address some of the greatest challenges facing the world today. By distributing this report, it is hoped that the insights documented within will contribute to a wider movement to harness the valuable intellectual work being done at universities for the greatest possible impacts on the problems of our time.

Workshop Organizers:

Patricia Culligan, PhD, M.Phil
Columbia Engineering: Fu Foundation School of Engineering and Applied Science

Wafaa El-Sadr, MD, MPH, MPA
Mailman School of Public Health and College of Physicians and Surgeons

Samuel Sia, PhD
Columbia Engineering: Fu School of Engineering and Applied Science

What universities have not yet done is create institutions that aim, across a broad range of specific topics, to connect academic work and the broad capacities of the academic community with organizations and parties beyond the academy that possess the power and influence to transform all this into concrete consequences benefitting humanity. This is the purpose of Columbia World Projects.

Lee Bollinger
President of Columbia University

Source: http://home.columbia.edu/content/columbia-world-projects
Workshop Format

The workshop began with an introduction that summarized the workshop format and goals. This was followed by three sessions that each began with two case studies, followed by breakout discussions in small groups and a report-back to the larger group. Following the first two sessions, a rapid, live poll was conducted to prioritize participant inputs. The workshop ended with a plenary session that brought participants together to discuss the way forward. The full workshop agenda is provided in Annex I.

Columbia World Projects implementation workshop participants (see participant bios in Annex 2)
Session 1: How to Select a Problem

In the current landscape of highly complex global challenges, the problems we select are as important as the solutions we identify. The workshop’s first session focused on answering the three questions listed below as a means of exploring what criteria participants use to select the problems they (or their organizations) choose to tackle, and what criteria they recommend.

1. What are the main criteria you use for selecting the problems you tackle?
2. What big, important problems are missed by using these criteria?
3. What criteria do you think should ideally be used in problem selection?

Two case studies were presented to ground the session in real-world examples:

**How Reality Redirected Work with Women and Girls in Kumasi, Ghana**
Presented by Susan M. Blaustein, Founder/Director of WomenStrong International and Co-Founder of the Millennium Cities Initiative

Dr. Blaustein described the evolution of her work to increase gender equality, girls’ education, and women’s economic empowerment, and to improve maternal and child health. In the earlier Millennium Cities Initiative, programming in Kumasi, Ghana was designed based on the results of a top-down needs assessment and analysis. While successful in many ways, her team found that the positive impacts of their interventions were not trickling out to meet the needs of market women and girls with whom they were working. At WomenStrong, she embraced a different approach: designing programming based on women’s self-identified priorities. She and her colleagues began working with groups of women and girls focused on implementing community-driven solutions designed to address their needs as they change over time. She emphasized the importance of “flipping the script”—listening first and foremost to the challenges as elicited from those with whom we work—and bringing in the technical and financial resources to address those challenges. She also underscored the importance of creating coalitions with other organizations capable of sustaining and furthering progress, as participants’ needs evolve in tandem with their progress.

**One Breath, More Life, Lasting Impact**
Presented by Steve Adudans, Executive Director of the Center for Public Health & Development (Nairobi, Kenya)

As a medical doctor in Kenya, Dr. Adudans was confronted with a painful reality: many newborns were dying due to a scarcity of medical oxygen. Analyzing this problem, he and his colleagues realized that procuring oxygen in Kenya cost over 10 times as much as in western countries, that oxygen was not being properly prescribed, and that babies prescribed oxygen were not being properly monitored. To address these varied causes of the scarcity, he and his colleagues designed a multi-pronged solution that has since decreased the number of newborn deaths. Logistical challenges were addressed by building large-scale oxygen plants that deliver oxygen to local hospitals at an affordable price. Safety and demand were addressed by training clinicians to prescribe medical oxygen and monitor patients properly. And to ensure
sustained impact, a mutually beneficial public-private partnership was developed whereby a private entity operates the oxygen plants, while committing to serve as an ongoing, reliable source of affordable medical oxygen to public hospitals in the region.

**Breakout Discussion**

Participants broke out into four discussion groups to discuss the issue of problem identification and then reconvened to report key points back to the full group. The following is a summary of key themes that emerged.

1. **What are the main criteria you use for selecting the problems you tackle?**
   - The problem must be meaningful (i.e., something we/communities/stakeholders care about).
   - The problem must be of sufficient scope such that addressing it has the potential to greatly impact human health or well-being.
   - Resources are available to address the problem. This includes having the financial, institutional, technical, and community resources—as well as the appropriate partners—needed to deliver impact in the time-frame available.
   - The level of stakeholder buy-in needed to deliver (and ideally sustain) impact must be available.

2. **What big, important problems are missed by using these criteria?**
   - Problems where the time frame for achieving impact is long.
   - Problems that will cost more than the financial resources available.
   - Problems perceived as “too big” or “too complex” to solve.
   - Problems for which needed skills or expertise are not available.
   - Problems for which solutions are high-risk or likely to fail.
   - Problems where there is not effective coordination among relevant actors.
   - Problems where there is insufficient stakeholder buy-in and/or political will.
   - Problems that are missing objective data and evidence.
   - Problems where a specific, needed technology or other innovation has not yet been developed.

3. **What criteria do you think should ideally be used in problem selection?**
   - Affected people/communities are involved in selecting and validating the problem.
   - A feasibility study and mapping exercise have been conducted to demonstrate confidence that:
     - The problem matters to those being impacted.
     - The solution does not “reinvent the wheel.”
     - There is sufficient time, as well as the needed financial, institutional, technical, and community resources, available to address the problem.
     - Partners and stakeholders are invested in taking on the problem.
• Addressing the problem has the potential to add considerable value to society and, ideally, has the potential for positive spillover effects.

• There is a good balance between selecting problems based on the idea of incrementalism versus being audacious and taking on big problems with a high risk of failure (i.e., “moonshots”).
  – Criteria for selecting a discrete aspect of a much larger problem include: 1) it represents a critical gap that is feasible to address; and 2) finding a solution to the smaller problem will lead us one step closer to solving a larger, more complex problem.
  – A key criterion for selecting a “moonshot” problem is that there is a chance that efforts will lead to a radical innovation that drastically enhances human well-being.

• Although there is often pressure to choose a problem and stick with it, a flexible and adaptive approach should be embraced that allows for—sometimes repeated—reformulation of the problem itself.
Live Poll

The following are the results of a rapid, live poll that was conducted to informally rank some of the problem selection criteria identified. (The number of respondents is shown to the right of each question.)

1. What are the three main criteria you use for selection of the problems you tackle?

- Significance, scope, and scale of impact: 88%
- Capability or qualification to address problem: 54%
- Possibility or feasibility of implementing a solution: 58%
- Do people or communities care about it: 54%
- Is it aligned with our values and interests: 38%

2. What big, important problems are missed by using these criteria? (1/2)

- Problems with long time horizons to solve: 59%
- Problems we are not good at or qualified to address: 50%
- Problems where social practices play a large role: 41%
- Problems where there are funding constraints: 41%
- Problems where leadership is from different depts. rather than centralized: 0%
- When there is unwillingness to fail: 45%
- When solution bias might bias away from certain problems: 36%

3. What criteria do you think should ideally be used in problem selection? (1/2)

- Problem has to matter to audience (leaders, stakeholders, community): 88%
- Resources need to match problem: 38%
- Identify areas where minimal input can have maximum impact (can do or should we do questions): 25%
- Map out landscape to ensure situational awareness: 42%
- Involve people who are most affected: 38%
- Invest or incentivize people to work on problem area: 21%
- Look at how problems are inter-connected: 29%
Session 2: How to Approach Identifying and Implementing Solutions

Once a specific problem has been identified, what are best practices for identifying and implementing solutions? The workshop’s second session sought to explore this question by focusing on the following three questions:

1. What is the overarching approach to identify solutions to problems?
2. What are things that you do well in implementing solutions to problems?
3. What are challenges you have faced in implementing solutions to problems?

Two case studies were presented to ground the session in real-world examples:

**African Network for Drugs and Diagnostics Innovation (ANDI) – A Case Study**

Presented by Solomon Nwaka, Executive Director of ANDI (Addis Ababa, Ethiopia)

Dr. Nwaka provided an overview of his work to create a sustainable platform for health innovation in Africa. To identify critical challenges to transitioning local innovations to market, Dr. Nwaka and his colleagues at ANDI began by conducting an extensive gap analysis. The analysis identified both expected and unexpected challenges, including a lack of financing mechanisms to drive local innovation, regulatory challenges, a lack of coordination, poor general understanding of the business and legal aspects of innovation, and a lack of political will to address these issues. To catalyze change, ANDI has been working to leverage local and global expertise—and coordinate academic, industry, and donor support—to develop solutions and support their implementation. Two examples Dr. Nwaka described were the Innovation Development and Entrepreneurship Africa (IDEA) University, a budding concept to offer practical entrepreneurship training with a link to venture financing; and the Advancing Healthcare Innovation in Africa (AHIA) initiative, a partnership between ANDI and Emory University to support and promote the advancement of health innovation and technologies in Africa by advising, educating, and training African scientists on the business and legal aspects of transitioning their innovations from the laboratory to market. Dr. Nwaka emphasized that the role of universities is shifting through partnerships such as this one, and that the time is right for universities to embrace opportunities to support the real-world implementation and scale-up of promising new technologies.
Experience of International Rescue Committee’s Research and Development Team
Presented by Ravi Gurumurthy, Chief Innovation Officer of International Rescue Committee (IRC)

Ravi Gurumurthy first explained the origin of IRC’s Research and Development (R&D) team: recognition of the fact that many existing practices do not deliver meaningful impact, while others are not easily scalable—and that all exist in a rapidly shifting global landscape. By creating an R&D team, IRC invested in a team with the capacity and resources to conduct careful prototyping of potential solutions before moving onto large-scale implementation, where learning is the primary objective.

Gurumurthy described the team’s general approach to its work: once a target problem has been identified, the team generates solutions to prototype by reviewing the evidence, conducting contextual analysis, and learning from analogous fields. The team may also identify a solution based on a team member’s hunch or because an existing product or service requires a delivery system innovation. The team may pivot repeatedly during prototyping, before moving onto a pilot phase. Gurumurthy emphasized the importance of thinking about scale from the very beginning of the process (e.g., is there a partner that can help scale the innovation?). He also emphasized that creating R&D hubs in different locations has had multiple benefits, including economies of scale, lower transaction costs, and dedicated, concentrated efforts at each hub.

Breakout Discussion

Participants broke out into four discussion groups and then reconvened to report key points back to the full group. Following is a summary of key themes that emerged.

1. What is the overarching approach to identify solutions to problems?
   - Define the type of solution being aimed for: one that disrupts the current paradigm; one that incrementally changes it; or one that sustains it?
   - Conduct a problem tree analysis to break down the problem into manageable components before attempting to design a solution.
   - Careful scoping is critical, including: mapping the landscape of existing ideas, evidence, and experiences; considering leverage points in the system where intervention may catalyze change, and engaging in consultation with a broad range of key informants.
   - Ensure that the right stakeholders are at the table. This includes ensuring that a diversity of perspectives is represented and that those with the skills, experience, and reach to implement and sustain the solution are engaged from the beginning.
   - Throughout the design process, engage and listen to all key stakeholders—both those who stand to benefit and those who stand to “lose” if the solution is successful.
   - Engage in rapid desk experimentation and/or prototyping to test and refine the solution before progressing to field implementation.
   - Conduct an analysis of the solution’s potential sustainability and scalability.
• Identify solutions that maximize the possibility of mutually beneficial partnerships/coalitions (e.g., a solution in an academic context that engages students, faculty, staff, and leadership).
• The identification of solutions should be an inherently reflective and adaptive process; there should be recognition from the start that the solution itself may need to be modified several times—sometimes radically—to be successful.

2. **What are things that you do well in implementing solutions to problems?**
   • Defining the implementation strategy and what resources are needed.
   • Using evidence-based strategies.
   • Planning for challenges and pivoting as needed.
   • Building internal and external coalitions and convening partner/stakeholder meetings.
   • Monitoring and evaluating project implementation.
   • Diffusing innovations internally.

3. **What are challenges you have faced in implementing solutions to problems?**
   • Securing the necessary funding.
   • Identifying funders that can tolerate risk and/or uncertainty.
   • Aligning incentives of, managing relationships with, and promoting trust among key partners and stakeholders.
   • Forgetting to identify and engage those who stand to lose from a particular solution.
   • Designing and implementing an effective, fully integrated communications strategy.
   • Sustaining momentum.
   • Relying too heavily on a single charismatic leader, rather than the overall team needed to successfully implement a solution.
   • Finding hybrid leaders who can lead with humility.
   • Planning for, and responding to, organizational challenges that emerge during implementation (e.g., issues with internal communication and coordination).
   • Thinking ahead and planning for the potential unintended consequences of scaling a solution.
   • Remembering that the same solution that worked in one context may not work the same way in another context.
   • Developing and resourcing a plan to ensure that the solution’s impact will be sustained.
   • Tracking and measuring the solution’s impact.
   • Disseminating information about failed solutions.
**Live Poll**

The following are the results of a rapid, live poll that was conducted to informally rank some of the criteria identified for solution selection and implementation. (The number of respondents is shown to the right of each question.)

<table>
<thead>
<tr>
<th>4. What is your overarching approach to identify solutions to problems? (1/2)</th>
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<tbody>
<tr>
<td>Get right stakeholders together and listen to them</td>
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<tr>
<td>Break down problem and develop problem-specific process</td>
</tr>
<tr>
<td>Map landscape of existing ideas and collect validating evidence</td>
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<tr>
<td>Identify leverage points and barriers</td>
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<tr>
<td>Consider scalability</td>
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<tr>
<td>Consider sustainability</td>
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<tr>
<td>Translate problem to other parties</td>
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<tr>
<td>Identify your skills and specialties</td>
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<tr>
<td>Identify stakeholder incentives and parties that will block or amplify the idea</td>
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<tr>
<th>5. What are things that you do well in implementing solutions to problems? (1/3)</th>
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<tbody>
<tr>
<td>Being adaptable (learning and changing) throughout entire process</td>
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<tr>
<td>Using evidence-based approaches</td>
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<tr>
<td>Knowing your own capacity and being honest about what you do not know</td>
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<tr>
<td>Having a fully integrated communications strategy (from beginning)</td>
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<tr>
<td>Identifying measure (conditions) of success from the start</td>
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<tr>
<td>Aligning incentives of all parties</td>
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<tr>
<td>Identifying and engaging those who will lose out if you succeed</td>
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<tr>
<td>Considering durability and sustainability from the start</td>
</tr>
<tr>
<td>Building internal and external coalitions</td>
</tr>
<tr>
<td>Being transparent</td>
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<tr>
<td>Integrating cross-disciplinary expertise</td>
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### 6. What are challenges you faced in implementing solutions to problems? (1/3)

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Percentage</th>
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<tr>
<td>Difference in incentives or priorities between various stakeholders</td>
<td>42%</td>
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<tr>
<td>Unintended consequences when programs scale</td>
<td>21%</td>
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<tr>
<td>Organizational structure issues: fragmentation</td>
<td>25%</td>
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<tr>
<td>Effective communication: internal and among stakeholders</td>
<td>21%</td>
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<tr>
<td>Availability of funding</td>
<td>46%</td>
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<tr>
<td>Ability to handle risk and uncertainty</td>
<td>25%</td>
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<tr>
<td>Trust issues or competition rather than collaboration among stakeholders</td>
<td>29%</td>
</tr>
<tr>
<td>Balance of innovation vs practicality or pragmatism</td>
<td>21%</td>
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<tr>
<td>Having the right people: leaders, staff, partners, decision-makers at the table</td>
<td>25%</td>
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<tr>
<td>Lack of knowledge base</td>
<td>8%</td>
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<td>Primacy of donor requirements and priorities driving activities</td>
<td>17%</td>
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<tr>
<td>Timing of projects (long arcs)</td>
<td>4%</td>
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Session 3: How to Define Success

How do we determine whether a solution has addressed a problem successfully? The workshop’s third session sought to explore this question by focusing on the following three questions:

1. What are the main criteria you use for defining success?
2. For each criterion, what is one important metric you use to measure success?
3. What are situations where the selected metrics did not get at whether a problem was addressed?

Two case studies were presented to ground the session in real-world examples:

**Medicines Too Expensive for Poor People**

Presented by Olive Shisana, President and CEO of Evidence Based Solutions

Professor Shisana described her experience participating in the urgent struggle to lower the price of antiretroviral drugs for people living with HIV in the late 1990s. At the time, more than 1.5 million people were dying each year from HIV/AIDS. When South Africa tried to change its laws to allow for local production, compulsory licensing, and parallel importation as a means to lower the cost of the life-saving drugs, they were taken to court by dozens of multinational companies that claimed this would undermine their profits. Determined to find a solution that would increase access to these medicines in resource-limited settings, African countries mobilized and—with the support of allied transnational actors and non-governmental organizations—succeeded in getting an international resolution passed by the World Health Assembly affirming that public health must trump private interests. This resolution represented a major global health victory, leading to a dramatic decrease in the price of antiretrovirals in the countries hardest hit by the HIV epidemic, including South Africa. It enabled governments to finally begin to respond effectively to the unfolding public health crisis, paving the way toward the ultimate success of a steady decrease in AIDS-related deaths. In the context of this case study, Professor Shisana identified several criteria for success: 1) adoption of the resolution that all countries agree that public health trumps private interests; 2) establishment by the World Health Assembly of a Commission on Intellectual Property Rights Innovation and Public Health to monitor potential conflicts between the mandates of different international organizations; and 3) access to less costly medicines, leading to widely available HIV treatment and a significant decline in AIDS mortality.
What Does Success Look Like? Case Study of 100&Change

Presented by Cecilia Conrad, Managing Director of MacArthur Fellows and 100&Change, John D. and Catherine T. MacArthur Foundation

Dr. Conrad described her experience as director of 100&Change, a new call for proposals that grants a single winner $100 million to implement a feasible, meaningful, scalable, and long-lasting solution to an urgent problem. Far exceeding expectations, the inaugural 100&Change yielded over 1,900 proposals from 77 countries. These proposals were narrowed down to eight semi-finalists over the course of nine months of intensive work by an external panel and technical consultants. In addition to being assessed for scalability, proposals were scored on their meaningfulness, verifiability, feasibility, and durableness. Conrad shared several lessons learned from the process: meaningfulness (Does the proposal seek to solve an important and urgent problem?) was not a good discriminator among the top 600 proposals; verifiability (Does the proposal present evidence that the solution has previously yielded practical and concrete results?) was a good discriminator, but excluded true innovations and most research proposals; feasibility (Does the team have the skills, capacity, and experience to deliver the proposed solution? Is the budget realistic?) was a good discriminator, but was biased against organizations with little track record; and durability (Does the team propose a solution that has staying power?) served as a notably useful discriminator among top proposals. Conrad went on to emphasize the importance of flexibility in defining metrics for success, and of engaging in ongoing conversation throughout the process of implementation to determine whether what we expected to work is actually working.

Breakout Discussion

Participants broke out into four discussion groups and then reconvened to report key points back to the full group. The following is a summary of key themes that emerged.

1. What are the main criteria you use for defining success?
   - **Progress toward goals.** Has progress been made toward pre-defined goals and objectives?
   - **Community and stakeholder engagement.** Were stakeholders involved in defining the metrics that will be used to measure success? Has there been continued stakeholder buy-in and engagement throughout the implementation process?
   - **Real-world impact.** Has the solution had a positive impact on elements of human welfare, the environment, public policy, etc.?
   - **Generalizability and scalability.** Have generalizable lessons been generated and disseminated? Has the solution set a new precedent and/or generated a ripple effect across groups doing similar work?
   - **Sustainability.** Will the solution’s impact be sustained?
   - **Cost-effectiveness.** Is the solution cost-effective? Has value for money been demonstrated?
2. **What are some important metrics you use to measure success?**

- A tension emerged between quantitative and qualitative measures of success. Funders usually value quantitative measures, but by focusing primarily on quantitative metrics—especially those that are “easy to measure”—implementers risk losing sight of the overall vision/desired impact.

- Just as it is important to use a reflective and adaptive approach to define the solution, the definition of metrics to measure success should also be an adaptive process. To be meaningful, metrics must reflect the nuances of the problem itself. When there is no iteration, success on pre-defined metrics may not reflect any real-world impact at all.

- Specific metrics to measure success may include:
  - Public health impact
  - Program participation
  - End-user/community satisfaction
  - Stakeholder buy-in
  - Efficacy (especially compared to existing programs or to giving away cash)
  - Affordability
  - Scalability

- Despite the focus on quantitative metrics, narratives can be a powerful way of demonstrating impact. Narratives and other qualitative tools can also be useful in communicating a solution’s impact to—and inspiring action among—policy-makers and other decision-makers.

3. **What are situations where the selected metrics did not get at whether a problem was addressed?**

- Where metrics do not fully capture the desired impact (e.g., when using the metric “number of clinics built,” when the clinics are actually empty).

- Where aggregate metrics mask disparities among sub-populations.

- Where metrics are defined by program implementers rather than end-users/communities.

- Where metrics reflect program outputs, rather than program outcomes or impact.

- When quantitative metrics are “gamed” to please funders.

- When pre-defined metrics become irrelevant due to a shifting landscape (e.g., after to a new technology has been developed, a major policy shift has occurred, etc.).

- When metrics do not capture negative spillover effects or unintended consequences.
Session 4: The Way Forward

During the workshop’s final session, participants discussed the optimal role of academic institutions in addressing the world’s most pressing problems. Given today’s complex ecosystem of funders, implementers, and governmental and non-governmental organizations, where can the academic sector add the most value?

A number of recommendations were voiced:

- Research universities should prioritize training skilled implementation scientists. This includes developing partnerships between and across universities in high-, middle-, and low-income countries to collaboratively build human capital in—and further develop—this nascent discipline.

- Internationally, some academic institutions already have a long track record of developing and implementing solutions to real-world problems. There should be a concerted effort to learn from these universities and how they have approached rooting themselves in their communities and conducting academic work that measurably improves human well-being.

- Universities should leverage the special qualities they have that make them uniquely suited to catalyze solutions to complex, global problems:
  - Universities have expansive research infrastructures that have traditionally focused on generating knowledge that all too often stays within the confines of the “ivory tower” of academia. With proper incentives, this same infrastructure could be used to identify and implement practical, rigorously tested, evidence-based solutions that bridge the gap between knowledge and action.
  - With an abundance of experts working at the cutting edge of disciplines as varied as public health, law, and engineering, universities are uniquely poised to cultivate cross-disciplinary inquiry, minimize duplication of effort, and catalyze change. Many of these same experts are respected thought leaders and influencers who can advocate for the importance of bridging the gap between knowledge and action, and disseminate new knowledge generated as a result of cross-disciplinary efforts.
  - Universities are independent and can direct resources toward generating knowledge about, and catalyzing action on, topics considered too controversial or politically-sensitive by most other sectors. Universities can gather objective data with scientific rigor.
  - Many academic fields have their own terms for what is essentially implementation science. A good place to start would be to invest in creating a common, cross-sectoral vocabulary that unifies efforts across the full spectrum of academic disciplines.
All universities have one abundant resource in common—students. During their course of study, many students engage in community-based projects, whether locally or internationally. These students should be an integral part of universities’ efforts to identify and implement practical solutions that unleash real-world impact on our society and planet.

With so many possibilities, participants expressed enthusiasm to learn where Columbia World Projects will decide to focus its efforts. Some voiced support for a re-convening to collaborate on the development specific projects.
Annex 1: Workshop Agenda

Columbia World Projects

Implementation Workshop
Italian Academy at Columbia University
1161 Amsterdam Ave, New York, NY 10027
June 7–8, 2018

Thursday June 7th, 2018

5:30–6:00 PM  Registration & Reception

6:00–8:30 PM  Dinner & Remarks
               Welcome from Columbia leadership
               Introduction of participants
               Overview of purpose of the workshop

Friday June 8th, 2018

8:00–8:30 AM  Breakfast

8:30–9:00 AM  Introduction to workshop goals and agenda

9:00–10:30 AM Session 1: Problem Selection
   9:00–9:20  Presentation of two case studies from pre-selected participants
   9:20–10:00 Breakout group discussions
   10:00–10:30 Breakout groups report back

10:30–10:45 AM Break

10:45–12:15 PM Session 2: Problem Solving
   10:45–11:05  Presentation of two case studies from pre-selected participants
   11:05–11:45  Breakout group discussions
   11:45–12:15  Breakout groups report back

12:15–1:00 PM  Lunch

1:00–2:30 PM  Session 3: Defining Success
   1:00–1:20  Presentation of two case studies from pre-selected participants
   1:20–2:00  Breakout group discussions
   2:00–2:30  Breakout groups report back

2:30–2:45 PM  Break

2:45–4:00 PM  Session 4: Summary and Way Forward
   2:45–3:30  Discussion and synthesis of Workshop deliberation
   3:30–4:00  Role of various stakeholders including academia and the way forward

4:00–5:30 PM  Closing reception
Annex 2: Workshop Participants

Lee C. Bollinger  
President, Columbia University

Lee C. Bollinger became Columbia University’s nineteenth president in 2002. Under his leadership, Columbia stands again at the very top rank of great research universities, distinguished by comprehensive academic excellence, historic institutional development, an innovative and sustainable approach to global engagement, and unprecedented levels of alumni involvement and financial stability. President Bollinger is Columbia’s first Seth Low Professor of the University, a member of the Columbia Law School faculty, and one of the country’s foremost First Amendment scholars. As president of the University of Michigan, Bollinger led the school’s historic litigation in Grutter v. Bollinger and Gratz v. Bollinger. These Supreme Court decisions that upheld and clarified the importance of diversity as a compelling justification for affirmative action in higher education were reaffirmed in the Court’s 2016 ruling in Fisher v. University of Texas. As Columbia’s president, Bollinger conceived and led the University’s most ambitious expansion in over a century with the creation of the Manhattanville campus in West Harlem. An historic community benefits agreement emerging from the city and state review process for the new campus provides Columbia’s local neighborhoods with decades of investment in the community’s health, education, and economic growth.

Dr. Steve Adudans  
Executive Director, Center for Public Health & Development

Steve Adudans is a global public health medical professional and social entrepreneur with immense experience in sustainable project formulation, implementation, and evaluation in resource limited settings. He is the Executive Director/CEO for Center for Public Health and Development (www.cphdev.org), Hewatele (HT) (www.hewatele.org), and MediQuip Global (MQG) (www.mediquipglobal.org). HT and MQG are social enterprises that aim to disrupt the health sector service industry by providing safe, affordable, and high-quality medical oxygen and biomedical equipment solutions, respectively. Steve received his undergraduate doctor of medicine and surgery training at the University of Nairobi, and post-graduate training in Infectious Diseases at the London School of Hygiene and Tropical Medicine (LSHTM). He is a member of Infectious Diseases Society of America (IDSA) and HIV Medicine Association (HIVMA).
Bernard Amadei  
Professor, University of Colorado at Boulder

Dr. Amadei is Distinguished Professor and Professor of Civil Engineering at the University of Colorado at Boulder. He received his PhD in 1982 from the University of California at Berkeley. Dr. Amadei is the Founding Director of the Mortenson Center in Engineering for Developing Communities. He is also the Founding President of Engineers Without Borders–USA and the co-founder of the Engineers Without Borders–International network. Among other distinctions, Dr. Amadei is the 2007 co-recipient of the Heinz Award for the Environment; the recipient of the 2008 ENR Award of Excellence; the recipient of the 2015 Washington and ASCE OPAL awards; the recipient of the 2016 C. H. Dunn Award of the Construction Industry Institute; an elected member of the U.S. National Academy of Engineering and the National Academy of Construction; and an elected Senior Ashoka Fellow. He holds six honorary doctoral degrees (UMass Lowell; Carroll College; Clarkson; Drexel; Worcester Polytechnic Institute; and Technion in Israel). In 2013 and 2014, Dr. Amadei served as a Science Envoy to Pakistan and Nepal for the U.S. Department of State.

Alex Amouyel  
Executive Director, Solve, Massachusetts Institute of Technology

Alex Amouyel is the Executive Director of Solve, an initiative of the Massachusetts Institute of Technology. Solve is a community of cross-sector leaders devoted to identifying and supporting solutions to actionable challenges through open innovation. Previously, Alex was the Director of Program for the Clinton Global Initiative, where she curated the content for the Annual Meeting. She also worked for Save the Children International in London and across Asia, the Middle East, and Haiti, and at the Boston Consulting Group. Alex holds a double Masters from Sciences Po, Paris, and the London School of Economics, and a Bachelors from Trinity College, Cambridge, UK.

David Berry  
General Partner, Flagship Pioneering

David Berry is a General Partner at Flagship Pioneering, which he joined in 2005. Trained as an M.D./Ph.D., David brings a multifaceted perspective to his work in conceiving, creating, resourcing, and launching groundbreaking companies. At Flagship, David has co-founded and helped build more than 20 companies across life sciences, technology, and sustainability, including Seres Therapeutics (NASDAQ: MCRB), Joule Unlimited, Evelo Biosciences (NASDAQ: EVLO), Eleven Biotherapeutics (NASDAQ: EBIO), LS9 (acquired by Renewable Energy Group), Axcella Health, and Indigo Agriculture. David holds over 200 patents and patent applications and is the recipient of several awards and honors for his work. He was elected as a 2014 Young Global Leader by the World Economic Forum. Additional accolades include recognition in 2013 in the PharmaVOICE 100 as one of the 100 most inspiring people in the life-sciences industry; inclusion on the Boston Business Journal’s 40 under 40 list.
in 2012; and being named as one of 12 Innovators Reshaping Reality by the U.S. State Department in 2008, alongside pioneers such as Craig Venter and Tim Berners-Lee. In 2007, David was named by the Technology Review as Innovator of the Year on the publication’s annual TR35 list. David’s companies and their innovations have been awarded with over 150 additional awards and honors. David is a founding Leadership Counsel member of the UN Sustainable Development Solutions Network. He also actively supports education and music, with a common theme of applying entrepreneurial principles to each. He serves on the board of the Hackley School and was formerly on the board of trustees at MIT and the board of the Boston Philharmonic Orchestra. David received his M.D. from the Harvard Medical School through the Harvard-MIT Health Sciences and Technology program. He completed his Ph.D. in MIT’s Biological Engineering Division and conducted his research in the labs of Dr. Robert Langer and Dr. Ram Sasisekharan.

**Susan Blaustein**  
*Founder/Director, WomenStrong International*

Dr. Susan M. Blaustein is Founder/Director of WomenStrong International, a global consortium of women-led organizations working to eradicate extreme urban poverty. Before starting WomenStrong, Dr. Blaustein co-founded and directed The Millennium Cities Initiative, a project of Columbia University’s Earth Institute committed to sustainable urban development across sub-Saharan Africa. There, over more than a decade, Dr. Blaustein repeatedly witnessed the effectiveness of local women and girls in the cities’ poorest communities, as they took the lead in effecting transformative change. Prior to her work at The Earth Institute, Dr. Blaustein served as a senior consultant and analyst with the International Crisis Group, a Brussels-based think tank focused on conflict prevention, and with the Coalition for International Justice, a Washington-based NGO supporting the efforts of international criminal tribunals to prosecute gross human rights abuses. She reported on conflict, politics, economics, and social injustice from the Balkans, Southeast Asia, and Washington, DC for such publications as The New Yorker, Harper’s, The Wall Street Journal, The Nation, The New Republic, and the Los Angeles Times. She served previously as Assistant Professor at Columbia University, where she still teaches. Her doctorate is from Yale University; she was a Harvard Junior Fellow in the Society of Fellows at Harvard University and a Guggenheim Fellow; and has been the recipient of multiple awards.

**Fred Cate**  
*Vice President for Research and Professor, Indiana University*

Fred H. Cate is Vice President for Research, Distinguished Professor, C. Ben Dutton Professor of Law, and Adjunct Professor of Informatics and Computing at Indiana University. He served as the founding director of Indiana University’s Center for Applied Cybersecurity Research, a National Center of Academic Excellence in Information Assurance Research and Information Assurance Education, from 2003 to 2014, where he is now a senior fellow. He also served as founding director of Indiana University’s Center for Law, Ethics, and Applied Research in Health Information from 2010 to 2015. Professor Cate specializes in information security and privacy law. He currently chairs the National Academies study on Law Enforcement and Intelligence Access to
Encrypted Content, and he is a member of the National Academies’ Forum on Cyber Resilience. He serves as a senior policy advisor to the Centre for Information Policy Leadership at Hunton & Williams LLP.

Previously, Professor Cate served as a member of the National Academies’ Committee on Technical and Privacy Dimensions of Information for Terrorism Prevention, the Department of Homeland Security’s Cybersecurity Subcommittee, the National Security Agency’s Privacy and Civil Liberties Panel, the OECD’s Panel of Experts on Health Information Infrastructure, Microsoft's Trustworthy Computing Academic Advisory Board, Intel’s Privacy and Security External Advisory Board, the Federal Trade Commission's Advisory Committee on Online Access and Security, and the board of directors of The Privacy Projects. He served as counsel to the Department of Defense Technology and Privacy Advisory Committee and as chair of the International Telecommunication Union's High-Level Experts on Electronic Signatures and Certification Authorities. He has testified before numerous congressional committees and speaks frequently before professional, industry, and government groups.

The author of more than 150 articles and books, he served as the privacy editor for the Institute of Electrical and Electronic Engineers' Security & Privacy and is one of the founding editors of the Oxford University Press journal, International Data Privacy Law. His most recent book, Bulk Collection: Systematic Government Access to Private-Sector Data, was published in 2017 by Oxford University Press. Professor Cate attended Oxford University and received his J.D. and his A.B. with Honors and Distinction from Stanford University. A former Senator and President of the Phi Beta Kappa Society, he is a fellow of Phi Beta Kappa and the American Bar Foundation, and an elected member of the Council on Foreign Relations and the American Law Institute.

Cecilia A. Conrad
Managing Director, MacArthur Foundation

Cecilia A. Conrad leads the MacArthur Fellows Program and 100&Change, the Foundation’s competition for a single $100 million grant to help solve a critical problem of our time. Before joining the foundation in January 2013, she had a distinguished career as both a professor and administrator at Pomona College, Claremont, CA. She joined the economics faculty at Pomona College in 1995. She served as Associate Dean of the College (2004-2007), as Vice President for Academic Affairs and Dean of the College (2009-2012), and as Acting President (Fall 2012). From 2007-2009, she was interim Vice President and Dean of the Faculty at Scripps College. As Associate Dean and Vice President for Academic Affairs at Pomona, Conrad championed the College’s summer undergraduate research program and expanded it to the arts and humanities, led conversations regarding the value and assessment of a liberal arts college education, nurtured collaborations between the arts and the sciences, and worked with academic departments to improve the campus climate for diversity. As a member of the faculty, Conrad contributed to the curriculum of several interdisciplinary programs and, in 2002, was recognized as California’s Carnegie Professor of the Year, a prestigious national award that recognizes faculty members for their achievement as undergraduate professors. Conrad's academic research focuses on the effects of race and gender on economic status. Her work has appeared in both academic journals and non-academic publications, including The American Prospect and Black Enterprise. Conrad serves on the Board of Trustees of Muhlenberg College and Bryn Mawr College. Conrad was the director of the American Economic Association’s (AEA’s) Committee on the Status of Minority Groups in the
Economics Profession (CSMGEP)’s mentoring program. Graduate students who participated in the program during Conrad’s tenure as director (1998-2005) are now on the faculty of Pomona College, Harvard, Yale, Ohio State, Cornell, University of North Carolina, and Howard, and on the staffs of the Mathematica Policy Institute, the Urban League, and several government agencies. She is a past president of the National Economic Association and of the International Association for Feminist Economics. Dr. Conrad received her B.A. degree from Wellesley College and her Ph.D. in economics from Stanford University.

Dr. France A, Córdova
Director, National Science Foundation

France A. Córdova is an astrophysicist and the 14th director of the National Science Foundation (NSF), the only government agency charged with advancing all fields of scientific discovery, technological innovation, and science, technology, engineering, and mathematics (STEM) education. NSF is a $7.8 billion independent federal agency; its programs and initiatives keep the United States at the forefront of science and engineering, empower future generations of scientists and engineers, and foster U.S. prosperity and global leadership. Córdova is president emerita of Purdue University and chancellor emerita of the University of California, Riverside, where she was a distinguished professor of physics and astronomy. Córdova was the vice chancellor for research and professor of physics at the University of California, Santa Barbara. Previously, Córdova served as NASA's chief scientist. Prior to joining NASA, she was on the faculty of the Pennsylvania State University where she headed the department of astronomy and astrophysics. Córdova was also deputy group leader in the Earth and space sciences division at Los Alamos National Laboratory. She received her Bachelor of Arts degree from Stanford University and her doctorate in physics from the California Institute of Technology.

More recently, Córdova served as chair of the Board of Regents of the Smithsonian Institution and on the board of trustees of Mayo Clinic. She also served as a member of the National Science Board (NSB), where she chaired the Committee on Strategy and Budget. As NSF director, she is an ex officio member of the NSB.

Córdova's scientific contributions have been in the areas of observational and experimental astrophysics, multi-spectral research on x-ray and gamma ray sources, and space-borne instrumentation. She has published more than 150 scientific papers. She has been awarded several honorary doctorates, including ones from Purdue and Duke Universities. She is a recipient of NASA's highest honor, the Distinguished Service Medal, and was recognized as a Kilby Laureate. The Kilby International Awards recognize extraordinary individuals who have made "significant contributions to society through science, technology, innovation, invention, and education." Córdova was elected to the American Academy of Arts and Sciences and is a National Associate of the National Academies. She is also a fellow of the American Association for the Advancement of Science (AAAS) and the Association for Women in Science (AWIS).

Córdova is married to Christian J. Foster, a science educator, and they have two adult children.
Patricia J. Culligan  
Robert, A. W. and Christine S. Carlton Professor of Civil Engineering  
School of Engineering and Applied Science, Columbia University  
A leader in the field of water resources and urban sustainability, Patricia Culligan explores novel, interdisciplinary solutions to the challenges of urbanization, with a particular emphasis on the City of New York. Her research investigates the opportunities for green infrastructure, social networks, and advanced measurement and sensing technologies to improve urban water, energy, and environmental management. She is co-Director of a $12 million research network sponsored by the National Science Foundation (NSF) to develop new models for urban infrastructure to make cities cleaner, healthier, and more enjoyable places to live. She was the founding associate director of Columbia University’s Data Science Institute and has served as the co-Director of the Earth Institute’s Urban Design Lab. She has also served on the Board of Governors of the American Society of Civil Engineer’s Geo-Institute and the National Academies Nuclear and Radiation Studies Board. She is currently leading a Congressionally Mandated committee that is assessing science and technology need for legacy waste management and clean-up. Culligan is the author or co-author of more than 160 technical articles. She received her BSc from Leeds University, England and her MPhil and PhD from Cambridge University, England.

Robert Eiss  
Senior Global Health Adviser, National Institutes of Health  
Robert Eiss serves as senior global health adviser to the Director of the National Institutes of Health (NIH), based in Bethesda, Maryland. At NIH, Mr. Eiss assumed lead responsibility for the NIH’s Fogarty International Center’s first long-range plan, which reoriented its programs to address infectious and non-communicable disease research and training needs of low- and middle-income countries. He also has served as principal drafter for White House National Science and Technology Council reports on U.S. Government Science and Technology Relations with Russia and European Union. Mr. Eiss has held management posts at the White House Office of National Drug Control Policy (ONDCP) and at an international NGO established by the Rockefeller Foundation to improve access to innovative medicines. At ONDCP, he served as director of planning and budget, involving budgetary oversight of national drug control agencies, establishment of a system of performance measures to monitor program effectiveness, and the management of a research portfolio on illicit drug consumption and consequences. As CEO of an international NGO, he promoted innovative and strategic management of intellectual property to speed the development of medical products that reduce global health disparities. Mr. Eiss holds degrees from the University of Maryland at College Park and Oxford University.
Wafaa El-Sadr MD, MPH, MPA  
Founder & Director, ICAP

Wafaa El-Sadr is the founder and director of ICAP at Columbia University, University Professor of Epidemiology and Medicine, and Mathilde Krim-amfAR Professor of Global Health at Columbia University.

Through ICAP at Columbia University, the Center she founded and directs, she was instrumental in supporting the establishment of large-scale global health programs in sub-Saharan Africa and Asia that integrate research, education, training, and practice. ICAP’s work in 30 countries around the world is focused on confronting and advancing major public health challenges, including HIV/AIDS, maternal and child health, women’s health, and non-communicable diseases, among others. ICAP aims to bridge the divide between knowledge and action, taking discoveries to implementation in the real world.

Prior to her work at ICAP, Dr. El-Sadr spent more than two decades at Harlem Hospital in New York City during the height of the HIV epidemic. She led the establishment of a novel program to respond to the epidemic that was centered on meeting the needs of affected individuals and families.

Dr. El-Sadr is also a prolific researcher with close to 400 publications. Her research interests are diverse and include research on the prevention and treatment of HIV, tuberculosis, non-communicable diseases, and maternal and child health.

Dr. El-Sadr was born in Egypt, received her medical degree from Cairo University, a Master in Public Health from Columbia’s Mailman School of Public Health, and a Master of Public Administration from Harvard University’s Kennedy School of Government. She was named a McArthur Fellow in 2008 and is a member of the National Academy of Medicine.

John Feighery  
Founder, mWater

John Feighery is an environmental engineer and social entrepreneur working to provide safe water and sanitation around the world. After spending 10 years at NASA managing environmental equipment on the international space station, he completed his PhD at Columbia University, researching new models to explain widespread groundwater contamination in rural Bangladesh. While at Columbia, John co-founded mWater, a nonprofit technology startup that provides free mobile data collection and analytics software to over 25,000 users in 143 countries. mWater works directly with clients from government, academia, and civil society to improve their services by building sustainable local capacity to manage and use data.
John Furlow
Deputy Director for Humanitarian and International Development, Columbia University

John Furlow joined Columbia University’s International Institute for Climate and Society (IRI) in May 2017. As Deputy Director for Humanitarian Assistance and International Development, John works with IRI’s scientists to help apply their research and expertise to decision making in public health, agriculture, infrastructure planning, and other vital sectors.

Prior to coming to IRI, John designed and led the Climate Change Adaptation Program in USAID’s climate change office. He advised the government of Jamaica in the development of its national climate change policy and its climate smart agriculture sector plan. John also led a project to develop Jamaica’s agro-climate service, which produces a seasonal forecast tailored for farmers and disseminated by text and agriculture extension workers. John helped launch the Climate Services Partnership in 2011. In 2015, he worked at the U.S. Department of State designing and managing the National Adaptation Plan (NAP) Global Network as part of U.S. preparations for the UN Climate Conference in Paris.

Maxine Griffith, FAICP
Adjunct Professor; Senior Advisor to the President, Columbia University

Maxine Griffith began her career as Director of a community planning and design center in Oakland, California, and as an architectural designer for the firm Hardy Holtzman Pfeiffer Associates. She currently serves as Senior Advisor to the President of Columbia University and also teaches Urban Planning at Columbia’s Graduate School of Architecture Planning & Preservation. Prior to her present position, Griffith was a Columbia Executive Vice President and a key member of the team planning the University's new campus in Manhattanville. She led the project through the complex City and State approval processes and negotiated the historic Manhattanville Community Benefits Agreement.

As Executive Director of the Philadelphia City Planning Commission and Deputy Mayor for Strategic Planning, Griffith coordinated all planning activities and managed the Capital Budget process. She worked in the Clinton Administration at the Department of Housing & Urban Development (HUD), first as the Regional Director for New York and New Jersey, and then as Assistant Deputy Secretary. From 1988 to 1996, she was Principal of Griffith Planning & Design, a firm providing planning, design, and development services to a broad list of public and private clients.

Ms. Griffith served a six-year term on the New York City Planning Commission. She has also served on the New York State Commission on the Restoration of the Capital, the Planning Accreditation Board, the American Planning Association, and the Lincoln Land Institute and Foundation. She now serves on the Boards of Directors of the Architectural League of New York, the Regional Plan Association, and SEEDs, an organization building schools and libraries in West Africa.

Maxine Griffith was born in Harlem. She holds a Master of Architecture degree from the University of California, Berkeley and certificates in Urban Planning and Real Estate Finance from Harvard University’s Graduate School of Design. She has won three National American Planning Association...
Awards. Griffith currently manages a small consulting practice, primarily, although not exclusively, in China.

In addition to her appointment at Columbia, Griffith has taught city planning and urban design at New York University and the University of Pennsylvania. She is a member of the National Organization of Minority Architects and is an accredited member of the American Institute of Certified Planners (AICP). In 2018, Griffith was elected to the AICP College of Fellows.

Ravi Gurumurthy  
Chief Innovation Officer, IRC Airbel Center

Ravi Gurumurthy is the founder of the IRC’s innovation center, Airbel. Prior to joining the IRC in 2013 as Vice President for Strategy and Innovation, he held a number of government roles in the United Kingdom, including Director of Strategy for the Energy and Climate Change Department, and Strategy Advisor and Speechwriter to the Foreign Secretary, David Miliband. Gurumurthy led a number of major social and environmental reforms, including the development of the world’s first legally binding carbon emissions targets, the reform of the U.K. electricity market, and the integration of education, health care, and social services for children. He has also worked as a researcher for the public policy organization Demos and in local government in London, and has chaired two national children’s charities.

Avril Haines  
Senior Research Scholar, Columbia University

Avril D. Haines is currently a Senior Research Scholar at Columbia University and a Lecturer in Law at Columbia University Law School. She served as Deputy National Security Advisor to President Obama, was the Deputy Director of the Central Intelligence Agency, and served as the Legal Adviser to the National Security Council. Before joining the National Security Council, she led the Treaty office at the Department of State, was the Deputy Chief Counsel for the U.S. Senate Committee on Foreign Relations, worked for The Hague Conference on Private International Law, and served as a law clerk for Judge Danny Boggs on the U.S. Court of Appeals for the Sixth Circuit. Avril received a bachelor’s degree in Physics from the University of Chicago, a law degree from Georgetown University Law Center, and founded and ran a bookstore café for five years while engaged in community service in Baltimore.
Jessica Justman
Senior Technical Director, ICAP

As Senior Technical Director at ICAP and Associate Professor of Medicine in Epidemiology at Columbia University’s Mailman School of Public Health, Dr. Jessica Justman oversees evaluations and ICAP service programs to strengthen clinical, laboratory, strategic information, and health systems. Dr. Justman’s research interests focus on HIV prevention clinical trials, international HIV epidemiology, and combination HIV prevention studies. She has extensive expertise in conducting population-based epidemiological studies of HIV incidence in both Africa and the U.S. In 2011, as one of the Principal Investigators of the CDC-funded Swaziland HIV Incidence Measurement Study, Dr. Justman led the design and conduct of the first national, prospective, population-based study of national HIV incidence. Since 2014, Dr. Justman has served as Principal Investigator of the CDC-funded Population-based HIV Impact Assessments (PHIA) Project. This groundbreaking project consists of HIV-focused surveys, which assess HIV incidence, prevalence of viral load suppression, and the reach of HIV care and treatment programs through household-based, nationally representative surveys in fourteen African countries.

Nick Lemann
Director, Columbia World Projects; Director, Columbia Global Reports; Joseph Pulitzer II and Edith Pulitzer Moore Professor of Journalism; Dean Emeritus of the Faculty of Journalism

Nicholas Lemann directs Columbia World Projects, a new initiative to connect academic work with entities beyond the academy that possess the power and influence to transform research into concrete consequences benefiting humanity. He also directs Columbia Global Reports, a book publishing venture that presents reporting around the globe on a wide range of political, financial, scientific, and cultural topics. Lemann is Dean Emeritus and Pulitzer Moore Professor of Journalism at Columbia. During his deanship, the Journalism School completed its first capital fundraising campaign, started its first new professional degree program since the 1930s, and launched significant initiatives in investigative reporting, digital journalism, and executive leadership for news organizations. Board memberships include Columbia’s Knight First Amendment Institute and the Russell Sage Foundation. Lemann is a member of the New York Institute for the Humanities and the American Academy of Arts and Sciences, and a staff writer for The New Yorker.
Khawar Mann  
Chief Executive Officer, Abraaj Growth Markets Health Fund

Khawar Mann is the Chief Executive of the Abraaj Growth Markets Health Fund, a fund raised to create a platform of health care provider assets for the low-middle income and middle income populations of Africa and South Asia. The platform’s investments are measured both by financial returns and the impact created as a result of increased access, affordability, and quality of health care services, as well as strengthened systems.

Prior to joining The Abraaj Group, Khawar was a Partner with Apax Partners, an international private equity firm where he specialized in health care investments. He was also Chairman and President of Medsi Group, Russia’s largest private health care company.

Khawar earned a degree in Medical Sciences and Law from Cambridge University and an LLM Master of Law. He received an MBA from The Wharton School, where he was a Fulbright and Thouron scholar. He is a founder of Mosaic, the UK-based mentoring charity, for which he received an OBE.

Ahmed Mushfiq Mobarak  
Professor, Yale University

Ahmed Mushfiq Mobarak, a native of Bangladesh, is a Professor of Economics at Yale University with concurrent appointments in the School of Management and Department of Economics.

He is a member of the Board of Directors of the Jameel Poverty Action Lab (J-PAL) at MIT, as co-chair of its Urban Services Initiative and of its Environment & Energy Sector work. He is also the academic lead for the Bangladesh Research Program for the International Growth Centre (IGC) at LSE, and Scientific Advisor to Innovations for Poverty Action, Bangladesh.

Mobarak has several ongoing research projects in Bangladesh, Brazil, Chile, India, Indonesia, Kenya, and Malawi. He conducts field experiments exploring ways to induce people in developing countries to adopt technologies or behaviors that are likely to be welfare improving. He also examines the implications of scaling up development interventions that are proven effective in such trials. His research has been published in journals across disciplines, including Econometrica, Science, The Review of Economic Studies, the American Political Science Review, Proceedings of the National Academy of Sciences, and Demography, and covered by the New York Times, The Economist, Science, NPR, Wired.com, BBC, Wall Street Journal, the Times of London, and other media outlets around the world. He received a Carnegie Fellowship in 2017.

Mobarak is currently collaborating with Evidence Action in multiple countries to replicate, test, and scale his research program that encourages rural to urban seasonal migration to counter seasonal poverty. This program, called No Lean Season, is supported by GiveWell.org, Good Ventures and the Global Innovation Fund, and the start-up accelerator Y-Combinator.
J. Stephen Morrison  
**Senior Vice President and Director, Global Health Policy Center**

J. Stephen Morrison is senior vice president at the Center for Strategic and International Studies (CSIS) and director of its Global Health Policy Center. Dr. Morrison writes widely, has directed several high-level commissions, and is a frequent commentator on U.S. foreign policy, global health, Africa, and foreign assistance. He served in the Clinton administration as committee staff in the House of Representatives, and taught for 12 years at the Johns Hopkins School of Advanced International Studies. He holds a Ph.D. in political science from the University of Wisconsin and is a magna cum laude graduate of Yale College.

Solomon Nwaka  
**Founding Executive Director, African Network for Drugs and Diagnostics Innovation (ANDI)**

Dr. Solomon Nwaka’s career spans various academic, public, and international organizations in countries such as Belgium, Canada, Ethiopia, Germany, Italy, Japan, Nigeria, Switzerland, and the U.S. Presently, he is the founding Executive Director of ANDI – African network for drugs and Diagnostics Innovation, which is hosted by UNOPS in Addis Ababa. Previously, he led various R&D units at the World Health Organization’s Tropical Disease Research in Geneva, Switzerland and also served as head of Drug Discovery and Innovation at the Medicines for Malaria Venture in Geneva. Dr. Nwaka has published extensively on innovation, partnerships, and capacity building.

Jean Oelwang  
**President, Virgin Unite**

Jean Oelwang is President of Virgin Unite, the entrepreneurial foundation of the Virgin Group, and a Senior Partner in the B Team. In 2003, Jean left her post as joint CEO of Virgin Mobile Australia to begin working with Richard Branson and the Virgin staff from around the world as the founding CEO of Virgin Unite. Over the last 14 years, Jean has worked with partners to create new approaches to social and environmental issues, such as the Branson Centres of Entrepreneurship and a platform to support budding entrepreneurs. She has led the incubation of a number of global leadership initiatives, such as The Elders, The Carbon War Room, The B Team, and Ocean Unite. In addition, Jean has been instrumental in working with Virgin’s businesses and others worldwide to put driving positive change at their core.

In her previous life, Jean lived and worked on six continents helping to lead successful mobile phone start-ups in South Africa, Colombia, Bulgaria, Singapore, Hong Kong, Australia, and the U.S. She was also a Partner in the global Virgin Group, with a focus on People & Purpose.
Jean has long explored the overlap of the business and social sectors and has been involved in both, having worked for the Foundation for National Parks and Wildlife in Australia, and in numerous volunteer roles, including a stint as a VISTA volunteer where she worked with—and learned from—homeless teens in Chicago.

Justin Pearlman  
Chief of Staff, Office of the Provost, Columbia University  
As Chief of Staff, Justin Pearlman oversees a range of strategic, communications, and programmatic functions for the Office of the Provost. Prior to coming to Columbia, he was the Assistant Provost for Research at the University of Southern California. He holds a Ph.D. in Political Science from Duke University and a B.S. from the School of Foreign Service at Georgetown University.

Michelle Popowitz, JD, MPH  
Assistant Vice Chancellor for Research & Executive Director for UCLA Grand Challenges  
Michelle Popowitz has worked at UCLA since 2001, where she started with the School of Dentistry with a focus on administration and external relations. She was recruited to work for the Vice Chancellor for Research in 2011. Approximately 16 months later, she and former colleague, Jill Reddell (then Sweitzer), started a pilot program to catalyze team research on campus that blossomed into the campus-wide UCLA Grand Challenges initiative, which now consists of two Grand Challenges. While not involved with the daily operation of either Grand Challenge, Michelle serves as an advisor to the leaders and her team becomes involved with issues regarding campus navigation, branding, and activities designed to increase the public profile. Michelle is frequently invited to talk about the experience at UCLA with Grand Challenges, as UCLA is the first campus to commit to solve a specific Grand Challenge goal. In 2017, she co-authored the Report on University-Led Grand Challenges and started a Community of Practice for universities working in this space—both efforts funded by a grant from the Schmidt Family Foundation. In the last month, she has been working on an APLU effort related to Public-Focused Research (which includes Grand Challenges and other research efforts with a focus on public impact). While Grand Challenges keep her busy, Michelle was fortunate to find time to participate in the 2016 UC-CORO Systemwide Leadership Collaborative. Prior to joining UCLA in September 2001, Michelle worked as a transactional attorney and in hospital administration.
Kenneth Prewitt
Carnegie Professor of Public Affairs, Columbia University; Special Advisor to the President

Kenneth Prewitt is the Carnegie Professor of Public Affairs at Columbia University. He taught Political Science at the University of Chicago from 1965–1982, and for shorter stints was on the faculty of Stanford University, Washington University, the University of Nairobi, Makerere University, and the Graduate Faculty at the New School University (where he was also Dean). Prewitt's professional career also includes: Director of the U.S. Census Bureau, Director of the National Opinion Research Center, President of the Social Science Research Council, and Senior Vice President of the Rockefeller Foundation. He is a fellow of the American Academy of Arts and Sciences, the American Academy of Political and Social Science, the American Association for the Advancement of Science, the Center for the Advanced Study in the Behavioral Sciences, the Russell-Sage Foundation, and member of other professional associations, including the Council on Foreign Relations. Among his awards are a Guggenheim Fellowship, honorary degrees from Carnegie Mellon and Southern Methodist University, a Distinguished Service Award from the New School for Social Research, the Officer's Cross of the Order of Merit from the Federal Republic of Germany, the Charles E. Merriam Lifetime Career Award from the American Political Science Association, and a Lifetime National Associate of the NRC/NAS.

Hillary Schrenell
Project Officer, Columbia World Projects

Hillary Schrenell joined Columbia World Projects in May 2018 to work on project development and implementation. She was most recently Deputy Commissioner for International Affairs in the NYC Mayor’s Office, where she developed new programs to leverage the United Nations as a resource for New Yorkers. Prior to joining City government, Hillary served as senior advisor to the U.S. Ambassador to the United Nations, coordinating with senior U.S. government officials on a range of global issues. She is a graduate of Dartmouth College and Harvard Law School and a member of the State Bar of Texas.

Olive Shisana
Professor; President and CEO of Evidence Based Solutions

Professor Olive Shisana was awarded the national award: The Order of the Baobab in Bronze by the South African President for her outstanding contribution to the field of science and community service, particularly her tireless work in researching solutions to the scourges of HIV and AIDS. Professor Shisana is an exceptional social scientist and public health specialist who has been in Public Service for more than 30 years, both in exile and back home.

She has served as Director-General in the Department of Health, Principal Investigator of several national population-based HIV surveys, President of the International Social Science Council, and Chief Executive
Officer of the Human Sciences Research Council. In 2013, she received the South African Academy of Sciences “Science-for-Society” Gold Medal. She has also worked at the World Health Organization (Executive Director for Family and Community Health) and chaired the inaugural Council of the Brazil, Russia, India, China, and South Africa (BRICS) Think Tanks after South Africa joined BRICS. She is an honorary professor at the University of Cape Town (Psychiatry and Mental Health Department) and was awarded the Doctor of Laws honoris causa degree by Monash University.

Professor Shisana always brings wisdom, boundless energy, and an eye for practical solutions to the meeting places of science and community service. She participated in the liberation struggle, led the technical team that demarcated South Africa into nine provinces, and participated in transforming the civil service. She is best known for her contributions to social sciences research in the areas of HIV and AIDS and National Health Insurance.

Professor Shisana is currently the President and CEO of Evidence Based Solutions (Pty) Ltd, a new company dedicated to providing research and technological support in the areas of public health and information and communications technology for health to African countries. She consults inter alia for the UNAIDS, UNFPA and Commonwealth.

Samuel Sia
Professor of Biomedical Engineering, Columbia University

Samuel Sia, a Professor of Biomedical Engineering at Columbia University, has developed novel technologies for point-of-care blood tests, both in an academic and industry setting. He is co-founder of Claros Diagnostics, which garnered European regulatory approval for a prostate-cancer blood test for doctor’s offices, and was acquired by OPKO Health (NYSE: OPK). Dr. Sia’s work in global health diagnostics has garnered coverage from Nature, Science, JAMA, Washington Post, BBC, NPR, Voice of America, Science News, Popular Science, Chemical and Engineering News, and MIT Technology Review. His lab-on-a-chip device has been tested in Rwanda to collect and analyze blood tests at a patient’s bedside to diagnose infectious diseases. He was named by MIT Technology Review as one of the top’s world young innovators, and is an inducted fellow of the American Institute for Medical and Biological Engineering. He is founder of Harlem Biospace, a biotech incubator facility in New York City (developed with the NYC mayor’s office) that has hosted over 50 biotech companies. He also currently co-directs the entrepreneurship initiative for Columbia’s School of Engineering and Applied Sciences. Dr. Sia has a B.Sc. in Biochemistry from the University of Alberta, and a Ph.D. in Biophysics (with a HHMI predoctoral fellowship) from Harvard University. Dr. Sia completed a postdoctoral fellowship in Chemistry and Chemical Biology at Harvard University.
**Joseph Sinfield**  
**Associate Professor; Founding Director, Engineering Innovation and Leadership Studies, Purdue College**

Joe Sinfield, is an Associate Professor of Civil Engineering and the founding Director of Purdue’s College of Engineering Innovation and Leadership Studies Program. Dr. Sinfield's research, teaching, and professional activities are concentrated in two focal areas: 1) innovation science, particularly in the context of corporate and socio-technical challenges, and 2) experimental methods, digital technologies, and sensor design. Sinfield has nearly two decades of experience as an advisor to senior leaders of multi-national corporations on systematic methods to identify, prioritize, and commercialize growth opportunities; design new business models; and manage strategic change in diverse global settings. Sinfield held the position of Senior Partner at Innosight, LLC, where for 13 years he helped lead the firm from a small start-up to a global innovation strategy and investment firm that was acquired by a publically traded company. Prior to Purdue and Innosight, he spent six years as a strategy consultant with McKinsey & Company, where he worked in the corporate strategy and innovation and technology management practices. Dr. Sinfield is a frequent speaker on the management principles that can be employed to more predictably drive innovation and has served on the innovation advisory boards of multiple companies, including his current role on the TPT Scientific Advisory Board of Procter & Gamble. He is co-author of The Innovator’s Guide to Growth: Putting Disruptive Innovation to Work, and has published in a wide array of peer-reviewed technical and business journals, as well as popular press outlets. Dr. Sinfield received a B.S. degree in civil engineering summa cum laude, from Bucknell University, Lewisburg, PA, and M.S. and Sc.D. degrees in civil and environmental engineering from the Massachusetts Institute of Technology, Cambridge, MA. He also worked as a geotechnical engineer at Haley & Aldrich in Cambridge, Massachusetts early in his career.

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**Greg Van Kirk**  
**Co-Founder, New Development Solutions Group**

Greg Van Kirk is an Ashoka Lemelson Fellow and the co-founder of The New Development Solutions Group. This includes Community Enterprise Solutions, Social Entrepreneur Corps, and NDS Consulting. These are all ventures whose mission is to design and implement innovative responses to long-standing development challenges. Greg also works part-time as “Social Entrepreneur in Residence” at Columbia University. He and his team are now focused on expanding the reach of their innovative “MicroConsignment Model” globally. Greg began working in rural small business development as a Peace Corps volunteer in 2001. He has served as an economic development consultant for organizations such as USAID, Chemonics, Columbia University, Vision Spring, Soros Foundation, Church World Service, OneRoof, Fundacion Solar, Fundacion Paraguaya, IDB, and Water4People. Greg worked in investment banking for five years before arriving in Guatemala. Two deals he led at UBS during this time won "Deal of the Year" honors from "Structured Finance International" magazine. Greg currently lives with his family in New York City.
Annex 3: Background Material on Implementation Science

The following overview was prepared by the workshop facilitators—Drs. Patricia Culligan, Wafaa El-Sadr, and Samuel Sia—and provided to participants for review ahead of the workshop.

*Getting the science right is a necessary but not sufficient step in getting it used (Prewitt, 2015)*

**Definition of, and Motivations for, Implementation Science**

In the inaugural issue of the Journal of Implementation Science\(^2\), Eccles and Mittman (Eccles & Mittman, 2006) defined Implementation Science as “the scientific study of methods to promote the systematic uptake of research findings and other evidence-based practices into routine practice.” According to (Fisher, Shortell, & Savitz, 2016), “if ‘implement’ means to put into effect according to a definite plan, then: Implementation Science is the study of factors that influence the full and effective use of innovations in practice.”

Initially established with a focus on the medical and health fields, Goldstein and Olswang provide the following motivations for developing the field of implementation science (Goldstein & Olswang, 2017):

- **Failure of the assumption that the traditional research pipeline would lead to implementation of evidence-based-practices in clinical and health-care settings.** Despite the fact that health care research generates knowledge that can improve clinical and community practices, it takes an average of 17 years for evidence-based findings to reach practice, and even then adoption rates are less than 15% (Balas & Boren, 2000). In the field of environmental research, lag times can be even greater, with gaps of 30 years or more between scientific understanding and policy action to protect the environment.\(^3\)

- **Failure of the assumption that evidence-based practices exist, and the primary shortcoming is simply the inability to get them implemented.** In health care, evidence-based practices describe the integration of research evidence with clinical expertise and patient values and preferences in decision making and health care delivery (Sackett, Rosenberg, Gray, Haynes, & Richardson, 1996), Figure 1. Since research evidence, clinical skills, and patient values and preferences are not static, neither are evidence-based practices. Thus, there is a need to continually evolve and refine understanding in this area.

- **Failure of the assumption that robust interventions will change the behavior of the vast majority of patients and those responsible for implementing interventions.** This belief assumes homogeneity in stakeholders, whether they be clients/patients, service providers, administrators, etc., which is unwarranted. Instead, evidence-based-practices need to effectively adapt to differences in clients, settings, health care issues, etc.

- **Finally, failure of the assumption that once successfully implemented, evidence-based practices will be sustainable because success will reinforce continued implementation.** This assumption ignores the role of institutions in supporting changes in procedures and policies, as well as a myriad of other changes, which might be needed to ensure sustainability in real-world settings.

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\(^2\) [https://implementationscience.biomedcentral.com](https://implementationscience.biomedcentral.com)

\(^3\) [https://pubs.acs.org/doi/full/10.1021/acs.est.8b00874](https://pubs.acs.org/doi/full/10.1021/acs.est.8b00874)
Evidence-based practice is the integration of clinical expertise, patient values, and the best research evidence into the decision-based process for patient care.\footnote{http://guides.mlibrary.duke.edu/c.php?g=158201&p=1036021}

Since the adoption of Implementation Science as a means to help translate evidence-based-practices related to health into positive outcomes for patients and communities, other fields and areas have also turned to Implementation Science as relevant for bridging research-to-practice gaps. Examples include endeavors in Special Education (Cook & Odom, 2013), Conservation Biology (Toomey, Knight, & Barlow, 2017), and Environmental Sustainability (Hering, 2016).

The evidence-based practice model presented in Figure 1 can more generally be adopted to describe how innovations, external knowledge, evidence and experience, decision making, and local knowledge, resources, values, and experience all might intersect in the development of interventions (i.e., solutions) to a problem. Innovations, external knowledge, and experience might include academic knowledge based on research evidence, but, equally, might include existing policies, technologies, or other strategies known to be generically effective in reducing the impacts of a problem; for example, water filtration as a technical intervention to lower diarrheal morbidity and mortality in developing communities (Tellen, Nkeng, & Dentel, 2010) or community-based law enforcement initiatives as a program intervention to reduce gun violence (Makarios & Pratt, 2012).
Theories, Models, and Frameworks in Implementation Science

In order to provide a better understanding of how and why implementation succeeds or fails, the field of Implementation Science has begun to develop numerous theories, models, and frameworks. According to Nilsen, these approaches broadly fall under the following three categories (Nilsen, 2015):

- **Process models**, which describe and/or guide the process of translating research or other evidence-based knowledge into practice. While these models try to identify barriers and enablers to translating research or knowledge into practice, and also consider the temporal nature of implementation, they do not identify specific determinants of implementation success. Many of these models, which are sometimes termed “how-to-implement” models, were developed through author experiences of implementation in various settings, as well as expert opinion.

- **Determinant frameworks/classic theories/implementation theories**, which aim to understand and/or explain what determinants influence implementation outcomes. These approaches provide very little “how-to” support for implementation because many of the determinants used are generic and the sequence of implementation is not explicitly considered. These approaches do, however, recognize the multi-level nature of the determinants, from individual behavior and beliefs, to the physical and political setting of implementation, as well as potential (complex) relationships between determinants. Some approaches in this category were also derived from experience, while others were based on synthesizing results from empirical studies of implementation successes and failure and/or constructs borrowed from other fields such as psychology, sociology, and organizational theory.

- **Evaluation frameworks**, which aim to specify aspects of implementation that could be evaluated to determine implementation success.

According to Chaudoir et al. there exists no single theory or set of theories within Implementation Science that offer testable hypotheses about when and why specific determinants will predict specific
outcomes (Chaudoir, Dugan, & Barr, 2013). These authors attribute this state-of-affairs, in part, to the fact that there are “many moving parts to consider that can ultimately determine whether implementation efforts succeed or fail.” Chaudoir et al. do, however, propose a multi-level framework that organizes the determinants believed to affect implementation success as a means of guiding the design of Implementation Science research for the health field. Figure 3 is a more generalized adaptation of their framework. It supposes that a specific innovation (which might include a portfolio approach of interventions) is implemented by a provider or providers to an individual or community (end user) via a delivery mechanism (inner level) that is nested within a broader context (outer level).

**Figure 3 Multi-level framework for organizing determinants believed to influence implementation outcomes. Adopted from (Chaudoir et al., 2013).**

The innovation level factor represents characteristics of the innovation itself, including the relative advantage of adoption above existing practices, and the quality and understanding of evidence supporting efficacy in the application setting and domain.

The end-user level factor includes determinants such as beliefs, trust, motivation, and hurdles to adoption, individual characteristics (for an individual end-user), and community characteristics (for multi-end users).

The innovation provider level factor includes determinants that represent aspects of the provider who implements the innovation, where provider can include anyone who has contact with the community or individual where the innovation is being implemented. Determinants here include characteristics of the provider, such as attitudes toward innovation, as well as their influence, knowledge, and credibility.

The inner-level factor describes the setting in which the innovation is being implemented, which might include a health care setting, an educational setting, a market-based setting, or a policy-based setting. Determinants here include characteristics of the setting itself, such as leadership, readiness, and willingness for innovation, as well as features of the methods and strategies for dissemination and implementation of the innovation.
The outer-level level factor represents the broader context of the implementation. This might include aspects of the political, social and economic climate, existing public policies, and features of the physical location itself, such as the state of infrastructure.

Measures of implementation outcomes include adoption, fidelity (e.g., adherence to proper execution), effectiveness, penetration, and sustainability.

(Chaudoir et al., 2013) noted that, in the health care arena, while there are a number of measures available to assess determinants related to innovation, innovation-provider, and inner-level factors, there are relatively few measures available to assess end-user and outer level factors.

Overall, theories, methods, and frameworks in Implementation Science are in a nascent stage, despite the significant impact this field might have on enabling current knowledge and new discoveries to be put to service in solving some of the world’s most pressing problems.

**Problem identification**

Many of the problems that Implementation Science seeks to address, including adoption of innovations in health, have been identified as so-called “wicked” problems (Signal et al., 2013). “Wicked” problems are defined as continually evolving, having many causal levels, and having no single solution. Many are associated with a multitude of stakeholders who have different perspectives on the problem and its root causes. Well-cited examples of “wicked” problems include eliminating poverty, reforming public education, and climate change. (Burge & Mccall, 2014). However, there is the need for caution as possible over-use of the term “wicked” problem, noting that “wicked” problems and “tame” problems can be viewed as opposite ends of a single spectrum that is bisected by critical problems, which are defined as problems where something is obviously wrong, the problem affects a significant number of people, it can be solved, and should be solved.

Kasser and Zhao propose approaching the solutions to “ill-structured,” “wicked problems” by dissolving or reformulating problems into Feasible Conceptual Future Desired Outcomes (FCFDS), which can eventually be reformulated themselves as problems with solutions. Thus, actions to address “wicked problems” can be limited to a sub-set of the problem, which might lend itself to solution through an existing approach or the extension of an existing approach. (Kasser & Zhao, 2016)

Brown et al. propose “transdisciplinary imagination” as a means of resolving wicked problems, stating that in this approach “academic disciplines are combined with personal, local, and strategic understanding and researchers are required to recognize multiple knowledge cultures, accept the inevitability of uncertainty, and clarify their own and others' ethical positions.” The theme of transdisciplinary imagination has overlap with the intersections described in Figure 2. (Brown, Harris, & Russell, 2010)

In his argument for “clumsy” solutions to “wicked problems,” Grint proposes that the best approach to these problems might involve a “pragmatic approach” that calls upon the skills of bricoleurs, who are people who can adapt to the challenge at hand. (Grint, 2010) Of interest, Geng et al. also use “pragmatic” to describe Implementation research that strives to attain both rigor and relevance. (Geng, Peiris, & Kruk, 2017)

Overall, however, the Implementation Science field is unclear on how to identify problems for solution implementation, despite the fact that problem identification itself will influence all downstream steps to
implementation. Carefully identifying, or bounding, the problem to be solved is likely to be crucial for implementation success for all problems, excepting the most tame.

References Cited in Annex 3


Annex 4: Letting HIV Transform Academia—
Embracing Implementation Science

Wafaa M. El-Sadr, M.D., M.P.H., Neena M. Philip, M.P.H., and Jessica Justman, M.D.

The human immunodeficiency virus (HIV) epidemic has had an extraordinary global impact. Even as it has devastated societies, it has also inspired community empowerment, motivated impressive scientific discoveries, and provoked an unprecedented mobilization of vast resources for a single health condition. Not yet fully realized, however, is the epidemic’s potential for expanding the core mission of academic institutions to include the pursuit of a wider range of research.

Most universities focus on three core missions: transmitting knowledge to undergraduate students, developing the next generation of scholars through graduate education, and producing new discoveries through research. In both education and research, the past decade has seen dramatic changes. An increasing number of international students are studying at U.S. universities, and a substantial proportion of U.S. students are pursuing international experiences. Online educational initiatives have proliferated, reaching students beyond classroom walls, and several universities have established international centers and branch campuses. At the same time, research enterprises at universities have grown larger and more complex, with new technologies, use of massive data sets, and growing emphasis on multidisciplinary and interdisciplinary approaches to tackling key scientific challenges.

Universities could foster research in implementation science — the study of methods for improving the uptake, implementation, and translation of research findings into routine and common practice — to explore the best ways to apply knowledge and discoveries to the challenges facing local and global communities. This is a role, however, that many universities have not yet fully embraced.

The appropriate relationship between the core mission of academic institutions, particularly research universities, and the “real” world has long been a matter of discussion. At his installation on February 3, 1890, for example, the president of Columbia College in New York, Seth Low, articulated his vision of the purpose of the university and academic scholarship, saying, “There is no such thing as the world of letters apart from the world of men. . . . The scholar without this vision is a pedant. He mistakes learning for an end in itself, instead of seeing that it is only a weapon in a wise man’s hands.” Scholarship, Low believed, should be geared toward the betterment of humanity, and universities should be engaged in solving the practical issues affecting the world around them.

The HIV epidemic is challenging academic institutions to look beyond their traditional core roles and consider how to contribute more fully to the “world of men” — that is, to the public good. Specifically, the magnitude of this global health threat highlights opportunities for universities to recognize meaningful and scholarly research in implementation science in order to advance the health and well-being of populations around the world.

Of course, researchers at academic institutions have made major contributions to advancing our understanding of the HIV epidemic, including basic research on the pathogenesis of HIV disease; clinical research aimed at the discovery of new diagnostic, prevention, and treatment interventions; and epidemiologic research to identify risk factors associated with HIV transmission. The events that follow this discovery phase, however, have largely been considered beyond the purview of traditional academicians and have been left for entities such as governmental agencies and nongovernmental organizations to tackle. As a result, academic environments often place more value on the discovery itself and less value on learning how to realize the potential benefit of its application.

This disparity also applies to health conditions beyond HIV. Key discoveries remain confined to publications in journals and books, underutilized by the people most in need of them. This lack of use is largely attributable to the limited knowledge about how best to implement and scale up these discoveries. For example, neonatal resuscitation and basic emergency obstetrical interventions have been shown to be lifesaving, yet such care remains inaccessible in many resource-limited settings. Similarly, efficacious tools and interventions for diagnosing and preventing tuberculosis are often underutilized in places where they would have the most impact; such underuse contributes to the unchecked spread of the disease. If we understood how to implement these ideas in a variety of settings and at scale, they would profoundly affect the health and well-being of populations. But there has been insufficient research on ways of implementing these discoveries with fidelity and, most important, at large scale.

The paucity of implementation research extends beyond the health field. For example, in the field of education, preschool education has been shown to have value, but there has been very little research on how best to implement such programs to achieve the desired short- and long-term outcomes.

We believe this disparity should motivate a reexamination of the type of research valued by academic institutions. Such institutions should recognize two additional related but distinct types of research — research in the implementation of new discoveries and research in the practice of bringing them to scale to achieve meaningful results. Indeed, universities are well suited to this effort, since it often requires the participation of disciplines already found within academic institutions, including public health, medicine, economics, policy, engineering, and business. Some research in implementation science is in fact occurring within some non–health-related schools and departments, but its full potential has yet to be realized in either non–health-related or health-related areas.

Some observers may raise concerns about this new role for academia: How will engagement in implementation and scale-up research fit within the academic mission? Are academic institutions prepared to provide the necessary administrative systems and resources to enable successful engagement in this type of work, particularly on a global scale? Will this type of research meet with the same appreciation in academic environments as more traditional discovery research? Since implementation research may be misperceived as intrinsically lacking in rigor, researchers engaged in implementation science will need to distinguish their work with excellence in design and execution.

Although there will inevitably be challenges, we believe that welcoming implementation science and creating a supportive environment for academics who pursue this path carries advantages. Engaging in this broader research framework will accelerate the progress from discovery to scale-up by improving the iterative process that is central to the advance of science. As gaps in knowledge arise during studies of implementation or scale-up, such questions will spark further inquiry by discovery researchers. This cycle has already begun to occur. For example, during the implementation and scale-up of HIV-treatment
programs in resource-limited countries, it became clear that simpler methods for monitoring the response to antiretroviral treatment were needed. The need motivated discovery research to develop point-of-care assays for CD4 T cells. We anticipate that a broader intellectual framework will allow faculty and students to become engaged in the full spectrum of research, enable the application of a rigorous scientific approach to both discoveries and implementation, and lead to more informed policies.

The words of Seth Low remain relevant today, inspiring reflection on the mission of the university in the era of globalization. Academic institutions have an opportunity to embrace societal challenges more fully by placing value not only on discovering the “what” but also on elucidating the “how” and bringing to action discoveries with broad benefits. If the HIV epidemic successfully inspires an expanded academic mission, this transformation could be added to its many lasting legacies.

References Cited in Annex 4

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