A MODEL FOR INTRODUCING GLOBAL IDEAS TO THE U.S.

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A MODEL FOR INTRODUCING GLOBAL IDEAS TO THE U.S.

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Executive Summary

This final report presents the results of a study of five global ideas and their introduction into the U.S. The study had two aims:

1. To develop a conceptual model based in the diffusion of innovations research and practice paradigm that reflects the major components and their sub-components that determine how potential adopters in the U.S. perceive and consider global ideas that can contribute to cultures of health in their communities, and

2. To apply the resulting Designing for Diffusion (D4D) model to several case studies of health innovations from other countries as a means of assessing and revising the model to augment future decision making about bringing global ideas into the U.S.

Results suggest that the D4D model does a reasonably good job of explaining the importation of five global ideas into the U.S. and the experiences to-date of those innovations in the U.S. We suggest how the model should be modified to better account for factors that affect the introduction of health innovations into the U.S.

Results also suggest that there is a need among inventors, proponents and their partnership teams for guidance concerning scale up strategies to produce a self-sustaining diffusion effect in the U.S. We explore this need-based implication in the last section of this report.

We regard these results as tentative. Five is a small number of health innovations upon which to make claims, and our study was a post hoc assessment using only one type of data. Nevertheless, thousands of studies about the diffusion of innovations, many of them country-to-country assessments, provide a sturdy backdrop for this work. Moreover, study of these five very different health innovations has led to some remarkably consistent results across these cases. Thus, we share a degree of confidence about the utility of the model in question as a basis for developing guidance to help communities and intermediary organizations assess the range of factors that can affect success in introducing global ideas to U.S. communities and take action to improve their odds of achieving diffusion.

RESEARCH RECOMMENDATIONS ABOUT RESPECIFICATION OF THE MODEL

1. The Designing for Diffusion model components should be retained, but several of these components need further development. *Context,* and in particular, the framing of innovations by both supportive organizational partnerships and by potential adopting organizations and communities, merits additional empirical scrutiny so that inventors and proponents better understand how to identify and associate positive meanings to their innovations.

2. Specification of the *core components* that are responsible for the positive effects of health innovations and a logical understanding of how those components relate to implementation fidelity is of special import. Questions about the activities of innovation designers and their proponents in relation to reinvention, as well as the actions of adopters and implementers in relation to adaptation, require clarification so that all stakeholders better understand what they should and should not do in modifying health innovations.

3. The D4D model sub-component of *stigma* should be reconceptualized as *origin*. Stigma refers to a negative association, but our results suggest that health innovations from middle- and low-income countries or low-income communities in high-income countries can have positive associations concerning origin in the minds of U.S. stakeholders.

4. Important sub-components of the D4D model that we proposed and tested were not emphasized by interviewees. These included external validity, providing potential adopters with a choice of innovations, providing implementers with alternatives for implementation, and the timing and framing of innovations. That is, interviewees, when given the chance, did not suggest the importance of these sub-components to scaling up health innovations. This result can be interpreted in one or more ways; i.e., (a) contrary to the literature these sub-components really are unimportant to diffusion, (b) the data-collection method was insufficient to draw out this information from interviewees, or (c) these factors are important to diffusion but *our interviewees did not know to consider them* when making decisions about scale up. We believe the best answer to be the latter one. This leads us to recommendations about the need for guidance for practitioners.

PRACTICE RECOMMENDATIONS ABOUT THE DEVELOPMENT OF GUIDANCE

1. There was a shared sense among interviewees that they were operating *on the basis of trial and error*, without the benefit of systematic information about scale up and diffusion choices, trade-offs, and likely barriers. This suggests the need for guidance, either in the form of opportunities for meeting and discussion, or training and technical assistance, for inventors and their partners. More formal supports could of course by piloted and developed as an advice-sharing system or collaborative learning network for health innovation inventors and their partners.

2. Sustainable guidance for inventors, partners and supportive intermediaries could be developed in various formats. Minimum investment options such as webinars, tear sheets and practitioner publications may be sufficient and preferred by some stakeholders. Another option is prototyping and formative testing of an interactive decision tool to augment the information that inventors, partners and supportive intermediaries have as they face resource decisions about scale up and diffusion of global ideas. Advances in communication technology have made such tools increasingly user-friendly.

Section 1.

Introduction

In the United States, there is considerable variance in access to health care and quality of health care, community to community and among states. Preventive services also vary considerably, as does access to healthy food and water and opportunities for physical activity. These disparities are key drivers that position the quality of health and health care in the U.S. as only average when compared with health and health care in other high-income nations (Agency for Healthcare Research and Quality, 2016). Cost of health care in the U.S., however, is far from average. In a comparison with other Organization for Economic Cooperation and Development high-income countries, health care spending in the U.S. as a percent of Gross Domestic Product is not only the world's most expensive, it also exceeds that of the next highest spending nation by almost 50 percent (Mossialos, Wenzl, Osborn & Sarnak, 2016)).

While persistent disparities, middling quality, and high cost have inspired a search for solutions within the U.S., global ideas created in other countries and validated abroad have led some U.S. stakeholders to look internationally to improve U.S. health and health care (Hiatt, Kenney & Rosenberg, 2016). Transnational studies of global health innovations have almost solely concerned transfer from high-income countries to low-income countries (Frost & Reich, 2008). Yet recently, delivery organizations such as Henry Ford Health System have founded global health units to find and transfer promising practices from abroad for use with its providers and members (Henry Ford Health System, 2019). Nonprofits such as Global to Local and the Institute for Healthcare Improvement have begun to explore global health innovations as a means to drive domestic quality improvements and cost reductions in U.S. communities. Higher education institutions such as Duke University and, in Great Britain, Imperial College London have created emphases in this topic. Philanthropies such as the Commonwealth Fund and the Robert Wood Johnson Foundation have new emphases to explore and expand the transfer of effective health practices and programs into the U.S. (Bylander, 2016).

For potential adoption and implementation in the U.S., global health innovations can come from other high-income countries or from middle- or low-income countries. Some global health innovations have diffused to multiple countries prior to attracting the attention of stakeholders in the U.S. Global health innovations from other high-income countries may have been created under contextual conditions that have some similarities to what will greet them in the U.S., thus making their implementation easier in the U.S., including practices and programs created to benefit disadvantaged populations abroad that can be tried in the U.S. with disadvantaged populations.

There may be considerable promise in innovative practices, programs, policies and technologies that have been shown to be effective in low-income countries because of their resiliency in bare minimum resource settings.

Global health innovations that have been effective and scaled up in low-income countries may be of particular interest as ideas that may be solutions to the high cost of health care in the U.S. (Hiatt, Kenney & Rosenberg, 2016; Bhatti, Prime, Harris, et al., 2017; Bhatti, Taylor, Harris, et al., 2017). There may be considerable promise in innovative practices, programs, policies and technologies that have been shown to be effective in low-income countries because of their resiliency in bare minimum resource settings. For example, World Health Partners has provided hundreds of thousands of $2 telemedicine consultations to patients in rural states in India by establishing basic diagnostic centers that serve seven to ten villages as franchises (Pandey, Menezes & Ganeti, 2017). Can global health innovations from low-income countries survive and thrive in the U.S.?

Yes, they can.

Consider the well-known case of Grameen Bank that extends microfinance loans to impoverished women. The Grameen idea was begun by Muhammad Yunus at the University of Chittagong in Bangladesh in the wake of the Bangladesh famine of 1974 with a low-interest personal loan of $27 to a group of 42 families so that they could produce simple handmade products for sale and thus earn money. Since that time, the microloan concept, and Grameen Banks, in particular, have diffused across the world. In the U.S. over a 10-year period from 2008-2017, Grameen America had microfinance operations in 13 cities that had extended 347,000 loans worth $820 million to 97,000 women (Grameen America, 2017; Grameen Bank, 2019). In 2018, a Miami Grameen Bank opened, with Houston following in January 2019 (Leinfelder, 2019). A recent randomized trial found that microfinance institutions can effectively deliver health interventions that improve health status in communities (Baum, Elize & Jean-Louis, 2017).

Identifying the nature of health innovations that can move across national boundaries could allow for the strategic design of innovations and the partnerships put into place on their behalf to maximize their successful diffusion.

THE PRESENT STUDY

We use published literature, particularly research from the *diffusion of innovations research and practice paradigm*, to propose a novel conceptual model that can account for how global health innovations reach the U.S., get adopted by organizations and communities, scale up services so that they benefit more and more people, and then spread from site to site. In particular, we restructured existing models of diffusion and added new components to a model based on our thinking about global innovations. We conduct an exploratory test of this model with five global health innovations by thematically analyzing transcripts of interviews to assess whether the model captures the main factors that explain the global-to-local process, and consider how the model might be made to more accurately reflect what happened and why in these five cases. The five innovations are:

- AgeWell Global, originating in South Africa. This program pairs able older residents with less able elders through one-on-one meetings and mobile technology to improve health outcomes and drive down medical costs.
- Cardiff Violence Prevention Model, originating in Wales. This program provides communities a means to learn where, when and how violence occurs through a partnership with hospital emergency department staff and the police and then act to prevent further violence.
- Ciclovía, originating in Colombia. This community-based recreation program temporarily closes down city streets to automobile traffic in order to combat physical inactivity and social isolation while helping to integrate diverse communities.
- ConsejoSano, originating in Mexico. This private company contracts with health insurers in the U.S. to help clinics reach out in culturally appropriate ways to poor and disadvantaged community members so that they access local health services.
- Swedish Rheumatology Quality Registry, originating in Sweden and here referred to as the Swedish Quality Registry because of its application to additional health conditions in the U.S. This electronic medical record system enables patients as well as health care providers to input information about patient progress for improved decision making and greater patient engagement in disease management.

Five case studies of global health innovations and the stories of how these innovations came to the U.S. and were implemented is a modest basis for assessing and revising a generalized model of scale up and diffusion. Still, an exploratory study such as this one, when considered in light of the many hundreds of other studies about the diffusion process, can add value to decision making about other health innovations and the factors that are likely to be important for their importation and expansion in the U.S. We see particular worth in these factors—the components and sub-components of our revised conceptual model—as they might be used in the development of guidance to facilitate the global-to-local transference of promising innovations.

A DEMAND-SIDE LOGIC

A key assumption of our study is that attending to the demand-side (i.e., stakeholders in the U.S.) is more important than attending to the supply-side (stakeholders in other countries) in the global-to-local diffusion of innovation process. That is, the identification of promising practices, programs, policies and technologies that are scaling up in other countries is not the key challenge when the overall objective is implementation and sustained use of these innovations in U.S. organizations and communities. While factors can be identified that characterize innovation performance in their countries of origin (Bhattachayya, Wu, Mossman, et al., 2017), there is simply no shortage of global ideas as candidate innovations to bring to the U.S. As of February, 2019, the Global Innovation Exchange, a technology platform funded by the U.S. Agency for International Development and the Bill & Melinda Gates Foundation, listed nearly 10,000 innovations searchable by stage of development, topical domain, country of origin and investment level (Global Innovation Exchange, 2019).

The bottleneck in the movement of global health innovations is on the U.S. side of this diffusion challenge. This is where awareness, interest, trial adoption, adaptation, implementation and sustained use must all take place to realize improved cultures of health in communities. Each of these stages is a considerable barrier to overcome for the inventors and proponents of a health innovation. The information environment is a busy and constantly evolving marketplace of ideas where issues and solutions "compete" for the attention of media organizations, social media gatekeepers, and policymakers (Dearing & Rogers, 1996). Most potential adopters of health innovations are, somewhat to preserve sanity, critical consumers who are more inclined to stick with what they know and use rather than invest the time and energy to learn about innovations.

So, in health marketing terms, the translation of global ideas into U.S. solutions is mostly about generating demand-side "pull", not supply-side "push" (Orleans, Gruman & Anderson, 1999; Green et al., 2006; Dearing & Kreuter, 2010). Innovations and the dissemination of information about them is just the beginning, and usually a poor estimate of outcome and impact (Lomas, 1991; Davison, 2009). For every Grameen Bank-like example of successful global-to-local diffusion, there are many effective health innovations that fall by the wayside in the journey to U.S. organizations and communities.

This demand-side logic is why, in the present study, we gathered data primarily by interviewing U.S. stakeholders about the five innovations of study. U.S. organizations and communities are the market for these promising innovations (Dearing, 2015). And just as marketing scientists would have it, the customer is king.

Section 2.

A Designing for Diffusion Model

"[D]issemination must be planned and intentional or it will not occur in a systematic manner... and upfront planning makes all the difference."

— Kerner, Rimer & Emmons, 2005

In this section, we present the conceptual model that guides this study. The model has six components into which we group 25 sub-components. We derive these components and sub-components from prior literature and from new thinking about the international diffusion of health innovations from low- to middle-income countries to the U.S. Both the components and sub-components are what we used to draft our semi-structured interview protocol and orient ourselves when reviewing written materials about the innovations of study. Because we want the results of this work to be useful for affecting practice, we framed our inquiry in terms of how these components and factors can be used to stimulate diffusion. That's why we call this a designing for diffusion model.

Designing for diffusion (D4D) is the taking of strategic steps early in the process of creating and refining an innovation, such as an evidence-based health intervention, to increase its chances of being noticed, positively perceived, accessed and tried, and then adopted, implemented and sustained in particular practice settings (Dearing, Smith, Larson, & Estabrooks, 2013). The D4D approach takes concepts from the more general diffusion of innovation research and practice paradigm and several other social science literatures and applies them to affect *reach* into targeted population segments, as well as *rate* of innovation adoption in those population segments. Reach is important because a D4D approach can be used to address inequities in health by prioritizing reach to those organizations and communities that disproportionately serve disadvantaged populations. Rate is important because diffusion, left to naturalistic processes, can take a very long time.

WHAT IS DIFFUSION?

Diffusion is a social process that occurs among actual and potential adopters in response to learning about an innovation. Researchers have conceptualized diffusion either at the macro sociological level of societal sector or system and the importance of norms and associations (Dearing, Maibach & Buller, 2006), the communicative level of relationships and how those patterned linkages affect adoption over time (Rogers & Kincaid, 1981), or the psychological level of how individuals perceive innovations in the form of a codified set of pros and cons (Manning, Bearden & Madden, 1995). For many innovations, diffusion is well-explained by three factors of (1) adopters' perceptions of the innovation in question, (2) adopters' perceptions of others' reactions, and (3) the context surrounding the innovation's introduction to its potential adopters (Wejnert, 2002). When it occurs, diffusion of an innovation usually follows a sigmoid "S" shape, with a gradual start as only an adventurous few adopt an innovation, followed by the highly connected and influential members of a social system, which convinces the majorities of others to get onboard, and concluding with conversion of the skeptical small remainder (Figure 1). In contrast, employing strategies as a D4D approach can affect innovation reach and rate (Figure 2).

Figure 1.

For those innovations that successfully diffuse, the diffusion process can take a long time and widen, not narrow, inequities in health.

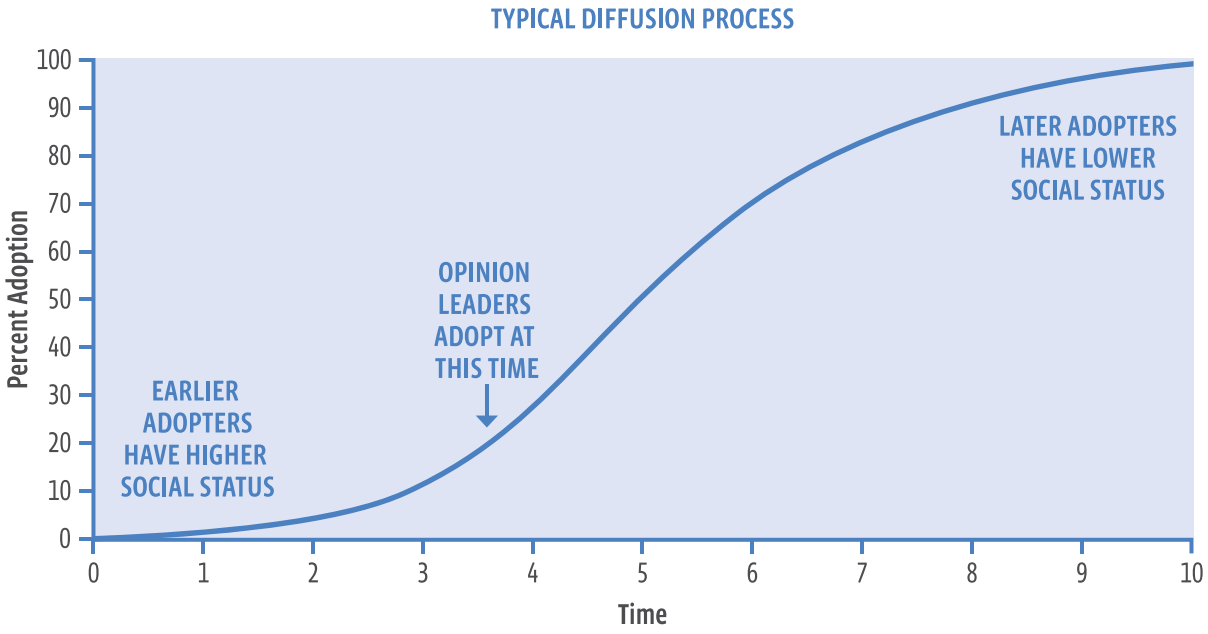
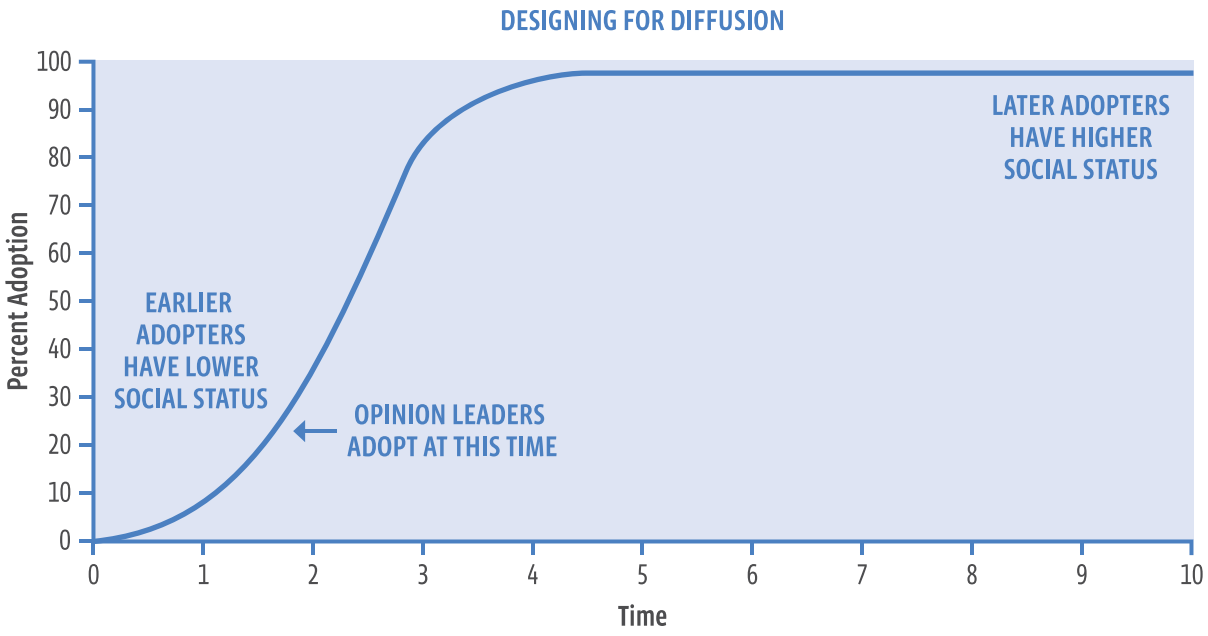


Figure 2.

Designing for diffusion means enacting strategies to affect both the reach and rate that characterize an innovation's diffusion into practice.



Although the general diffusion paradigm has been developed, refined and validated over 120 years to explain diffusion (Rogers, 2003), we don't know everything we might like to know. International application of diffusion concepts, for example, has either focused on an innovation from a high-income country and its diffusion within a low- or middle-income country, the process by which an innovation from a high-income country spreads among low- and middle-income countries, or tracing the spread of an innovation across many countries. Are the same factors important when the innovation moves from a low- or middle-income country to a high-income country? Perhaps the set of contributing contextual factors is different (Pfadenhauer, Gerhardus, Mozygemba, et al., 2017). Certainly, a favorable or unfavorable economic, social or political context can make or break the spread of health care innovations (Kaplan et al., 2010; Keown et al., 2014). Perhaps the regulatory challenges differ (Rowthorn, Plum and Zervos, 2016). Perhaps stigma associated with low-income countries affects how stakeholders in the U.S. perceive innovations from those countries (Harris, Weisberger, Silver & Macinko, 2015; Harris, Bhatti & Darzi, 2016). Perhaps certain attributes of innovations are especially important as innovations spread from low- or middle-income to high-income countries (Horton, Illingworth & Warburton, 2018; Wandersman, Alia, Cook, Hsu & Ramaswamy, 2016).

We considered these issues as well as the preponderance of evidence from diffusion research to generate a conceptual Designing for Diffusion model (Figure 3). This model differs from a generic diffusion of innovation model (Rogers, 2003) in several fundamental ways. First, the D4D model is purposive rather than descriptive in intent; that is, the essence of design is to *apply* evidence to improve social conditions such as the establishment of cultures of health. Created originally in 1957,[1] Rogers' diffusion of innovation model proposed a paradigm for understanding, not affecting, diffusion, even though the implications for attempting to do so were rather clear (Singhal & Dearing, 2006). Rogers' key contribution other than his program of diffusion investigations was in synthesizing diffusion studies conducted by scholars in disparate academic fields including anthropology, international development, education, rural sociology, agriculture, engineering and psychology into a generic[2] diffusion of innovation paradigm.

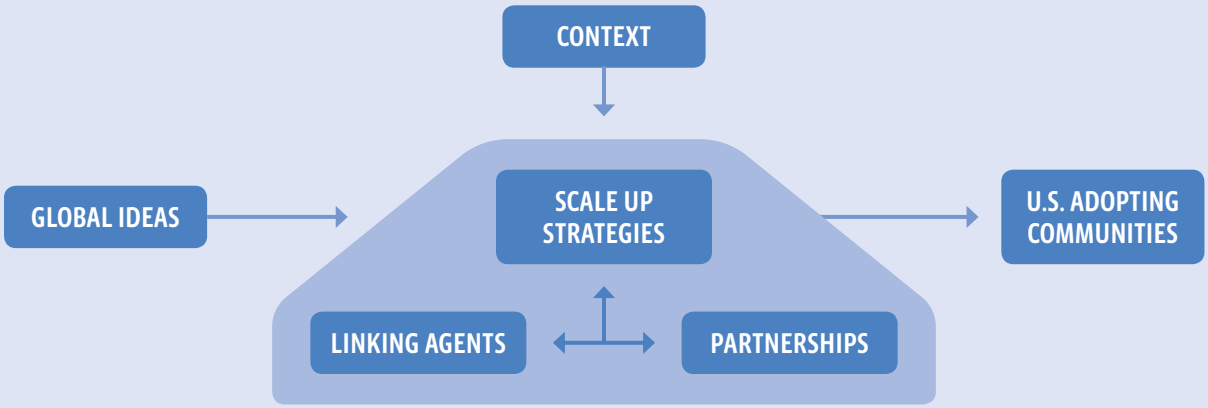
Other fundamental ways in which the D4D model differs from the generic diffusion model are the inclusion of strategies for affecting the reach of innovations, and the rate of spread. Some of these strategies derive from the generic diffusion model such as innovation attributes, but other strategies such as scale up pathways and partnership dynamics and conditions, do not.

[1] Ev Rogers' dissertation, *A Conceptual Variable Analysis of Technological Change*, was approved this year by his dissertation committee. Chapter Two became the basis for his 1962 publication, *Diffusion of Innovations*, which won numerous awards and became, through several editions, the most cited publication in the social sciences according to the Institute for Scientific Information.

[2] This was the reason that Rogers spent most of his academic career in departments of communication rather than in rural sociology or public health (disciplinary units in which he also was based). In the new field of communication, one could study the diffusion of *anything as* a communication process.

Here, we introduce each of the six components that comprise the model and briefly review the sub-components that comprise each component about which we then gathered data to analyze.

Figure 3.
Conceptual Designing for Diffusion (D4D) model for the present study.



GLOBAL IDEAS
1. Cost benefit
2. Effectiveness
3. External validity
4. Compatibility
5. Simplicity
6. Trialability
7. Observability
8. Stigma

LINKING AGENTS
1. Individuals: Policy Entrepreneurs, Knowledge Brokers, Innovators
2. Organizations: NGOs, Government Agencies

PARTNERSHIPS
1. National Partnerships
2. Community Partnerships

CONTEXT
1. Policy Environment
2. Economic Environment
3. Social Environment

SCALE UP STRATEGIES
1. Branching
2. Affiliation
3. Distribution Network
4. Dissemination
5. Choice of Innovations
6. Implementation Alternatives

U.S. ADOPTING COMMUNITIES
1. Multi-level Adoption
2. Implementation
3. Sustained Use
4. Process and Outcome Date

GLOBAL IDEAS

In this study we are interested in global health innovations with a broad orientation toward the concept of health; acknowledging the complexity of systems connected to the health of a community or any individual in that community. The ways in which communities and stakeholders perceive and understand an innovation is central to the research and practice paradigm of the diffusion of innovations. In particular, the perceived *attributes* of an innovation—their characteristics—play a key role in the flow of that innovation within and across systems (Silk, Hurley, Pace, Maloney, & Lapinski, 2014). Actual and perceived attributes can be differentiated; stakeholders' perceptions of the attributes of an innovation can be distinguished from a designer's intended attributes or subject experts' objective assessment of those attributes. In our conceptual model, we include eight attributes: Costs and benefits (monetary and non-monetary), effectiveness, external validity, compatibility, simplicity, trialability, observability, and stigma.

The *costs and benefits* of an innovation may be monetary or non-monetary. Weighing an innovation's perceived costs and benefits is a common way in which potential adopters approach a decision to try an innovation and it is strongly associated with adoption. When costs are perceived to be low, people often adopt (Dearing & Cox, 2018). Monetary costs and benefits, in this case, we restrict to cases where financial resources are likely to be lost or gained based on the adoption and implementation of an innovation. For example, some innovations involve cash payments for adoption of specific behaviors (termed *behavioral payment programs*; c.f., Conservation International; Lapinski, Kerr, Zhao, & Shupp, 2017), provide monetary loans for business start-ups (c.f., Grameen Bank), or reduce the costs of providing services in some way. Such innovations may be perceived as having monetary benefits at the level of the end-user but monetary costs for the organization that is going to make the program available to end-users. Other innovations involve financial as well as other costs such as the time required to learn how to use a new program or system. For example, monetary costs function as a barrier to adoption of electronic health record systems in the U.S. (Robert Wood Johnson Foundation, 2015) and healthcare providers must undergo training, daily protocols and monitoring to ensure their correct use.

Weighing an innovation's perceived costs and benefits is a common way in which potential adopters approach a decision to try an innovation and it is strongly associated with adoption.

The *effectiveness* of an innovation is the extent to which an innovation achieves outcomes intended by its designers. This can be operationalized as evidence of effect. Frequently, researchers assume that evidence will be sufficient to compel decision making to either adopt or not, though there are many documented cases of effective innovations that do not diffuse because of other factors mentioned here. Still, the diffusion literature has many studies that show the strong association between perceived effectiveness and adoption.

Compatibility is the extent to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters and is strongly associated with adoption (Rogers, 2003). Compatibility has been found to be a substantial predictor of adoption decisions, just as have costs and benefits, and effectiveness. Some scholars have considered compatibility to be a master attribute; that is, potential adopters primarily consider the fit between an innovation and their current behaviors, beliefs and needs in forming a decision about it.

Simplicity (or inversely referred to as complexity) is also strongly associated with adoption decisions (i.e., the simpler, the better). Simplicity is the extent to which an innovation is easy to understand and use.

Two other attributes are usually less associated with decisions to adopt an innovation. *Trialability* is the extent to which potential adopters are able to try an innovation before fully implementing it without suffering negative consequences. *Observability* is the degree to which the operation and results of an innovation are visible. Enhancing exposure to an innovation is positively related to adoption and for some types of innovations, strongly so.

In addition to the aforementioned attributes that are more typical of innovations in general, we included in our conceptual model two attributes of global ideas that may be especially important in the diffusion of innovations from low- or middle-income countries to the U.S.: external validity and stigma.

Since many global health innovations have already spread from one country to many other countries, it is reasonable to expect that this degree of *external validity* may factor heavily into the perceptions of stakeholders in U.S. communities when they learn of an innovation from a low- or middle-income country. Potential adopters might reason that if an innovation is being used to good effect in 40 countries, it is likely to work well in the U.S., too. External validity enables one to counter-argue the frequent claim that because an innovation was not invented in a particular country it is unlikely to work in that country (Leviton, 2017).

Another attribute that may be especially important when considering the global-to-local process is *stigma*, a negative perception that an object of attention is undesirable because of its association with a particular group of people, a place, or an event. In the present study, stigma refers to people's perceptions of the country of origin of a global idea and the attributions made about that country. Much of what is known about stigmatization applies to groups of people. The process of stigmatizing a particular group is generally characterized as having four interrelated components: The initial labeling and distinguishing of human differences, linking labeled groups to "undesirable characteristics or negative stereotypes", separation of the labeled objects, and discrimination against those who have been labeled (Link & Phelen, 2001; p.367). Stigmatizing others allows people to engage in a downward social comparison process that serves to maintain self-esteem (Dovidio, Major, & Crocker, 2000). The concept of nation branding (image management for countries) involves using corporate branding strategies to improve the image of a country (The Guardian, 2017). This is a recognition of the power of a country's image in driving economic investment, tourism, even political power. Given previous research that suggested the origin of innovation may impact adopters' perception and willingness to learn (Harris, Bhatti, & Darzi, 2016), we included stigma as an attribute for global health innovations.

LINKING AGENTS

The currency of a linking agent is often a compelling story—a narrative—about the creator and personal motivation behind a global idea.

A linking agent is an individual or organization that functions to tie together information about an innovation with actors who can help to broaden its availability. In our study, linking agents bring global health innovations to the U.S. by finding potential sponsors, partners or advocates. The linking agent plays a brokerage role. They tell decision makers about a global idea that holds the promise of benefits for end-users who are constituents, clients, patients or community members for whom the decision maker bears some responsibility. The currency of a linking agent is often a compelling story—a narrative—about the creator and personal motivation behind a global idea. When linking agents are successful actors in the diffusion of an innovation, their role gives way to what becomes an inter-organizational partnership of service providers, health experts, funding agencies, elected officials at a state, city, or district level, and stakeholders at organizations such as hospitals or community outreach programs (Culbertson, 1977). Using their expert knowledge and the ability to reach the resourceful people and decision makers who can take the initiative to either a national or local level, linking agents can play an integral role in the diffusion of health innovations that cross borders (Mintrom & Vergari, 1998).

Knowledge brokers and policy entrepreneurs are examples of linking agents. A *knowledge broker* has been defined as "an expert who acts as a link between researchers and decision makers" (Thompson, Estabrooks, & Degner, 2006, p. 692). According to a recent systematic review (Bombaum, Komas, Peirson, & Rosella, 2015), knowledge brokers play three primary roles in health settings of knowledge management, linkage and exchange, and capacity building, and can act as bridges for translating evidence into action (Ward, House & Hamer, 2009).

Policy entrepreneurs communicate about and advocate for health policies (Roberts & King, 1996). Policy entrepreneurs identify the need of a community, find a solution to resolve the problem, and frame the solution so that it is politically palatable to the eyes of decision makers (Keck & Kikink, 1998; Sabatier, 1988). A key difference of those who function as policy entrepreneurs compared to knowledge brokers is that the former have relational access to key stakeholders such as city mayors and legislators and are able to meet with them and persuade them of the worth of a global idea. In so doing, they often suggest or build coalitions of partners that can increase the chances of policy consideration and adoption (Kingdon, 2003; Stokes & Berry, 1999).

The nature of activities in which linking agents are typically involved are diverse, and closely intertwined with each step in the diffusion process and the characteristics of the innovation. For instance, some linking agents may need to exert more effort in finding willing partners when the innovation is targeted toward a very specific population. When an innovation is quite complex and thus difficult to understand or enact, a linking agent may need to spend more time educating potential adopters about an innovations' attributes, such as its compatibility with the goal or purpose of the potential adopting system. While some innovations need linking agents' close monitoring for sustained use, other innovations may only need linking agents to draw the attention of decision makers and disseminate information. Given this variability and complexity in tasks, separating the unique and independent effects of linking agents in the diffusion of an innovation is often difficult, which could be the reason for the relative lack of quantitative research on this topic (Bombaum et al., 2015). Still, diffusion researchers do report that linking agents are an integral part of successful diffusion (e.g., Culbertson, 1977; Havelock, Guskin, Frohman, Havelock, Hill, & Huber, 1971; Monahan & Scheirer, 1988; Roberts-Gray, Solomon, Gottlieb, & Kelsey, 1998). The linking agent's role may become even more crucial in cases of adopting foreign innovations in the U.S., since there may be additional skepticism in the U.S. about the applicability of the innovation in question.

PARTNERSHIPS

Many studies have noted that growing the impact of an innovation requires inter-organizational partnerships (Bloom & Chatterji, 2009; Frey, Lohmeier, Lee & Tollefson, 2006; Institute of Medicine, 2015) in which partners complement one another's strengths (Ackermann, 2013). This extends to intermediary organizations that bridge across delivery organizations to facilitate adoption (Institute of Medicine, 2014; Larson, Dearing & Backer, 2017) and multi-level adoption by authorities, providers and end-users so that barriers at one level do not stall implementation (Frost & Reich, 2008). Partnerships may be with organizations that have existing reach into priority populations, either directly to beneficiaries or to their direct service providers (Bradach & Grindle, 2014; Dearing, Maibach & Buller, 2006; Hussein & Kerrissey, 2013; Frost & Reich, 2008). These partnerships can be referred to as collaboratives, public-private partnerships, multi-stakeholder initiatives, social sector networks, or collective impact initiatives (Kania & Kramer, 2011). However labeled, they are ways for partner organizations to focus on a shared mission (such as reducing inner city poverty in American cities) rather than on growing an organization or a partnership in response to a social problem (Wei-Skillern, Silver & Heitz, 2014; McPhedran-Waitzer & Paul, 2011) which can slow or attenuate the growing of impact.

An inter-organizational partnership becomes the basis for a diffusion delivery system.

Thus, an inter-organizational partnership becomes the basis for a *diffusion delivery system*, one that is premised on active collaboration among the partners in achieving more implementations in more locations (Bradley et al., 2004). Usually, one organization plays a leadership role, linking the partner organizations, and steering the work of the partnership as questions about growth are addressed (Frost & Reich, 2008; Trent & Chavis, 2009). A lead role is often played by the inventor, who is responsible for creating the innovation and typically leads the team that debuts and tests it. There is an initiating organization, where the inventor is based, and a lead organization, which can be the initiating organization, but alternatively can be a new organization that conducts the organizing work of growing impact. Partnership organizations need to be selected, be compatible, understand their roles in the partnership, and determine how they will collaborate in growth.

Finding a prospective partner may pose challenges as they lack information about each other and easy ways to find out about one another (Austin, 2000). These partnerships can be formed with colleges and universities, nonprofit organization (both national and local), foundations, government agencies, corporations, consultants and technical experts, and network organizations, such as trade associations.

Organizational partners need to be *compatible* with each other. Partners need compatible goals or a shared purpose that will help them to reach consensus and retain commitment to growth objectives (Tsasis, 2009). Workplace cultures in the different partner organizations that are compatible can make the partnership easier to manage. Related to compatibility is the need for talents and skills to be complementary so that the partners are extending each other's *roles*. If partners decide to move ahead, they determine and enact roles specific to the growth objective.

SCALE UP STRATEGIES

Scale up refers to a process for serving more people with comparable benefits from the sustained implementations of a successful innovation. Actions taken to scale up an innovation are done by innovation inventors, proponents, and supportive intermediaries such as funders and partnering organizations. This means that scale up represents a set of strategies for achieving diffusion, since diffusion is a collective response by the adopters and implementers of innovations; i.e., those responding to the scaled up availability of an innovation.

In applying ideas about scale up pathways to the social sector, Simmons and Shiffman (2007) refer to a scale up strategy by which social innovations are communicated, transferred or otherwise promoted. Clark, Massarsky, Raben and Worsham (2012) describe a business model where decisions are made to engage in geographic replication and non-replication options, such as affiliating with new partners or working to change policy environments. Management Systems International (2012) describes expansion, replication, and collaboration as distinctive approaches for achieving scale. Gabriel (2014) writes about general scaling routes such as building a delivery network or forming strategic partnerships which are then further refined into *pathways* such as franchising and strategic alliances, respectively. These descriptions of pathways to scale can be viewed as a reasoned articulation of how to achieve scale up (Patrizi, Stephens, & McMullan, 2014; Larson, Dearing & Backer, 2017).

Branching occurs when a lead organization increases its own capacity to offer an innovation at new sites (Mulgan, Ali, Halkett & Sanders, 2007; Dees, Anderson & Wei-Skillern, 2004). In this type of pathway, the lead organization develops the innovation, distributes and implements it. Branching allows for considerable control over implementation because implementers are typically employees of the lead organization and go through the same extensive training with the same managerial and technical support that characterized earlier implementations of the program. Scale up via this approach is usually deliberate and incremental and can be slow, with multi-site additions often dependent on infusions of external investments, such as foundation grants or fee-for-service funding from participants or agencies in the new localities.

Corporations have long offered franchises to investors as a means of scaling up a business more rapidly than branching enables. This occurs in the social sector through *affiliates*, which are not always formal franchises although arrangements do usually involve a legal relationship (Oster, 1995). Affiliation occurs when implementing organizations in the field buy or license the rights from a lead organization to offer an innovation and the infrastructure that goes with it. Dees, Anderson and Wei-Skillern (2004) define affiliation agreements as being prescriptive on many dimensions including the use of a common brand name, program content, funding responsibilities, quality control, etc. Affiliates reduce financial risk to the inventor and lead organization, helping them bridge the gulf between a small-scale operation and a large-scale objective, partly by accessing local and regional resources to which inventors otherwise would not have access (Beckmann & Zeyen, 2014).

A *distribution network* pathway involves a lead organization working with a distribution organization to tap into the latter's existing networks of implementing organizations. Often the distribution partner is a national organization with many local member agencies, such as the YMCA or Boys & Girls Clubs of America, or an international agency such as the World Bank.

This strategy is variously described as a distribution network (Hussein & Kerrisey, 2013) a strategic alliance (Gabriel, 2014), "piggybacking" on another organization's infrastructure (Gabriel, 2014), or a networked approach (Wei-Skillern, 2014). For clarity we only use the term "distribution network" in this study. A distribution network allows partner organizations to focus on their shared mission (such as reducing poverty) rather than their own growth (Wei-Skillern, Silver & Heitz, 2014; Waitzer & Paul, 2011). This pathway can resemble a supply chain: One organization supplies and supports the innovation, while a distribution partner delivers it and other partners support effective use in organizations that adopt and implement the innovation.

Many researchers have concluded that dissemination alone is also the least effective pathway to adoption and impact.

Dissemination of information is a fourth route to scale up. Sometimes it may be the only effort by an inter-organizational partnership to spread the word and encourage adoption of a global health innovation. For some innovations that are easily communicated through specialty media and are simple to understand with benefits that outweigh costs, dissemination alone can be perfectly appropriate. Compared to growing the impact of a global health innovation by branching, affiliates or a distribution network, dissemination is the quickest and lowest cost pathway to scale. Many researchers have concluded that dissemination alone is also the least effective pathway to adoption and impact (Lomas, 1991). It is also the case that dissemination is frequently conjoined with the use of other scale up pathways.

U.S. ADOPTING COMMUNITIES

In our conceptual model, organizations and communities adopt innovations. As the word *communities* implies, the adoption process often involves decisions at multiple levels. For instance, adoption decisions may start with elected officials or authorities and "trickle down" to service providers and then their clients (the end-users). Or adoption may begin with the medical director of a hospital system, involve the organization's board of trustees, and then require adoption by department chiefs. A bottom-up directionality is also possible when grass roots organizers are able to bring pressure to bear on the decisions of their representatives or service providers. In this way, the innovation can be recognized by authorities and become an organizational or local governmental policy, which then must be implemented. Thus, it is important for the successful diffusion and adoption of an innovation to know in advance the multiple layers of decisions required and the logistic sequence of those decisions. Such knowledge can help prevent blockage due to resistance at one level (Frost & Reich, 2008).

In an organization or community, the people who make the decision to adopt an innovation (i.e., decision makers) and those who put the innovation to use (i.e., implementers) are often different (Rogers, 2003). In such cases, several problems can arise as decision makers may not have full knowledge about the challenges or situations implementers typically encounter; implementers, for their part, may not have a complete understanding of a complex innovation, or lack the skills, resources, or motivation required for proper implementation of the innovation. An effective and externally valid health innovation will not achieve its intended benefits if it is poorly implemented. Thus, investigating the extent and the quality of the implementation of an innovation is at least as important as achieving the initial adoption of an innovation (Dearing & Cox, 2018).

At the implementation stage after adoption in organizations and communities, the way that an innovation is implemented and delivered can change. *Fidelity* is the correspondence between the original design of the innovation and the actual implemented version of the innovation in the field (Perez, Van der Stuyft, Zabala, Castro, & Lefevre, 2015). Two ways through which fidelity is affected are reinvention and adaptation (Larson, Dearing & Backer, 2017). *Reinvention* refers to changes made to an innovation by its developers and partnership to increase the likelihood of adoption by organizations

and communities. *Adaptation* refers to changes made by adopters and implementers in organizations and communities so that an innovation works well with ongoing routines and resources, though implementers also sometimes adapt innovations unknowingly.

After an innovation is adopted and implemented, sustained use of the innovation is essential for the continuation of desired outcomes and organizational and community-level health impacts. *Sustained use* of a health innovation program is "the continued use of program components and activities for the continued achievement of desirable program and population outcomes" (Scheirer & Dearing, 2011, p. 2060). According to a recent review of sustainability of an innovation in healthcare settings (Stirman, Kimberly, Cook, et al., 2012), partial sustained use of a health innovation is more commonly found than entire sustained use, even when the entire innovation was initially implemented. These researchers also found that fewer than half of the providers sampled in previous research maintained a high degree of intervention fidelity, such as by continuing to offer all components of an innovation to organizational or community members. These findings suggest that achieving a high level of sustained use of a health innovation is difficult, and to a certain extent, adaptations naturally ensue (and may be desirable) over time.

While core components of an innovation need to be maintained (Stirman, Gutner, Crits-Christoph, et al., 2015), adaptations made by implementers, particularly through component addition rather than subtraction (Blakely et al, 1987), enhances the sense of ownership over an innovation, which can further increase the likelihood of sustained use (Scheirer & Dearing, 2011). Addressing the frequent reality of adaptations made to innovations by implementers means enumerating the key components of the intervention, and inquiring about the extent to which each component is continued. This type of operationalization builds on work in implementation science (see for example, Damschroder et al, 2009; Century, Rudnick and Freeman 2010) by first distinguishing *manifest components* of the innovation (e.g., trained coaches, written intervention protocols, interagency collaborative review) from the *theoretic components* that underlie the innovation and how it achieves its desired effects (e.g., stages of change, self-efficacy, behavioral reinforcement). Ideally, inventors and their partners would have identified manifest components as either *core* manifest components (those innovation structures and processes that causally lead to desired outcomes) versus *customizable* components that could be modified without logical or actual harm to the effectiveness of the innovation (e.g., the language for branding the intervention, use of images that closely mirror a particular new target population's demographic composition, additional steps or resources that a particular adopting organization has at its disposal or as a successful element of another of its innovations).

The collection and use of process and outcome data about the delivery and results of a global health innovation is very important for monitoring the effectiveness of the innovation in organizations and communities, and for making adaptations to heighten the effectiveness of the innovation (Substance Abuse and Mental Health Services Administration, 2017). Process data are collected during implementation to answer questions about the extent to which an innovation was implemented as planned and with what level of fidelity. Outcome data are collected after implementation to answer questions about the response to the innovation by individuals who are expected to be end beneficiaries. We expect that due to the international origin of global ideas, there may be more skepticism than usual about such innovations and, thus, greater attention to the role of data in adopting organizations and communities where they are implemented.

CONTEXT

The context in which a global idea moves across time and place includes a variety of facilitating, reinforcing, and hindering factors. We highlight here only what we believe to be the most important contextual influences for the movement of global ideas but acknowledge the complex environment in which these innovations exist. By *context*, we mean the inter-related conditions within which an innovation exists or occurs and to which the innovation is subject (see Bate, 2014 for a discus-

sion on context as a complex construct). We particularly focus on Bate's thinking about *outer* context considering the socio-cultural, policy and regulatory, market and resource, and technological aspects of context. In addition, we consider the ecological and historical aspects of context. As such, we describe issues such as public and private policies, human and environmental health infrastructure, and socio-cultural dynamics like social norms, timing, and the framing of the innovation in the mass media.

Appreciation of the importance of context means that there are better times and worse times for particular types of innovations to be introduced into U.S. organizations and communities.

Timing and framing are particularly important aspects of the context within which an innovation is introduced because they are actionable by inventors, their inter-organizational partnerships and their supportive intermediaries. Even when contextual influences are not coordinated as strategy, they can have consonant and mutually reinforcing effects. The result can be widespread appreciation of a normative shift, which leads individuals to change attitudes and behaviors, resulting in system-level public health change. Changes in policy, costs and social norms all contribute to such a context. This appreciation of the importance of context means that there are better times and worse times for particular types of innovations to be introduced into U.S. organizations and communities. These aspects of context can be monitored, assessed and acted upon by change agents and inter-organizational partnerships. The mass media can serve as a useful proxy for understanding when this sort of correlational function is operating and how global innovations contribute toward cultures of health in the U.S. (Lasswell, 1948).

RESEARCH QUESTIONS

Our research is designed to answer several questions about the process by which global ideas arrive in the U.S. and, thus, reflect on our conceptual model.

1. Does the conceptual model explain the diffusion (or lack thereof) of these health innovations into the U.S.? Are we missing key explanatory components or sub-components? Does the model specify components and sub-components that interviewees do not mention as important?
2. How are processes similar and different across the five health innovations of study?
3. What are the attributes of global ideas that most contribute to diffusion?
4. Which types of linking agents are identified as keys to diffusion?
5. What types of international, national and local partnerships are formed for these innovations?
6. What strategies do partnerships enact to facilitate scale up and diffusion in U.S. organizations and communities?
7. Which contextual factors are identified as facilitating or hindering the diffusion of health innovations into the U.S.?

Section 3.
Methodology

INCLUSION CRITERIA AND CASE IDENTIFICATION

Innovations were identified and selected based on a multi-step process. First, through examination of the published and gray literature and web searches, a database of candidate innovations was created. Our initial search focused on pro-social public or environmental health ideas, practices, or programs that originated outside the U.S. and had spread to at least one other country. Team members searched academic journals (such as *JAMA*, *PLoS One*), practitioner magazines (such as *MIT Innovations* and *Stanford Social Innovation Review*), websites (such as those for Ashoka and the Acumen Foundation), and materials from aid organizations (such as the World Bank and USAID). Next, because of expertise at the Robert Wood Johnson Foundation (RWJF) in this topical area, we met with the RWJF Global Ideas for U.S. Solutions team for team members' suggestions of candidate innovations. We then convened a project advisory group (PAG) of experts[3] in healthcare and public health for their suggestions of candidate innovations and possible interviewees. This process resulted in an initial set of 39 innovations for consideration. These are briefly described in Appendix A.

Four research assistants compared each potential innovation against the following inclusion criteria:

- The innovation is of international origin with spread to multiple international sites
- The innovation can be accurately characterized as pro-social
- The innovation is from a low- or middle-income country, or serves low-income people in a middle- or high-income country other than the U.S.
- The innovation has spread to the U.S.
- Process or outcome data appear to exist about the innovation

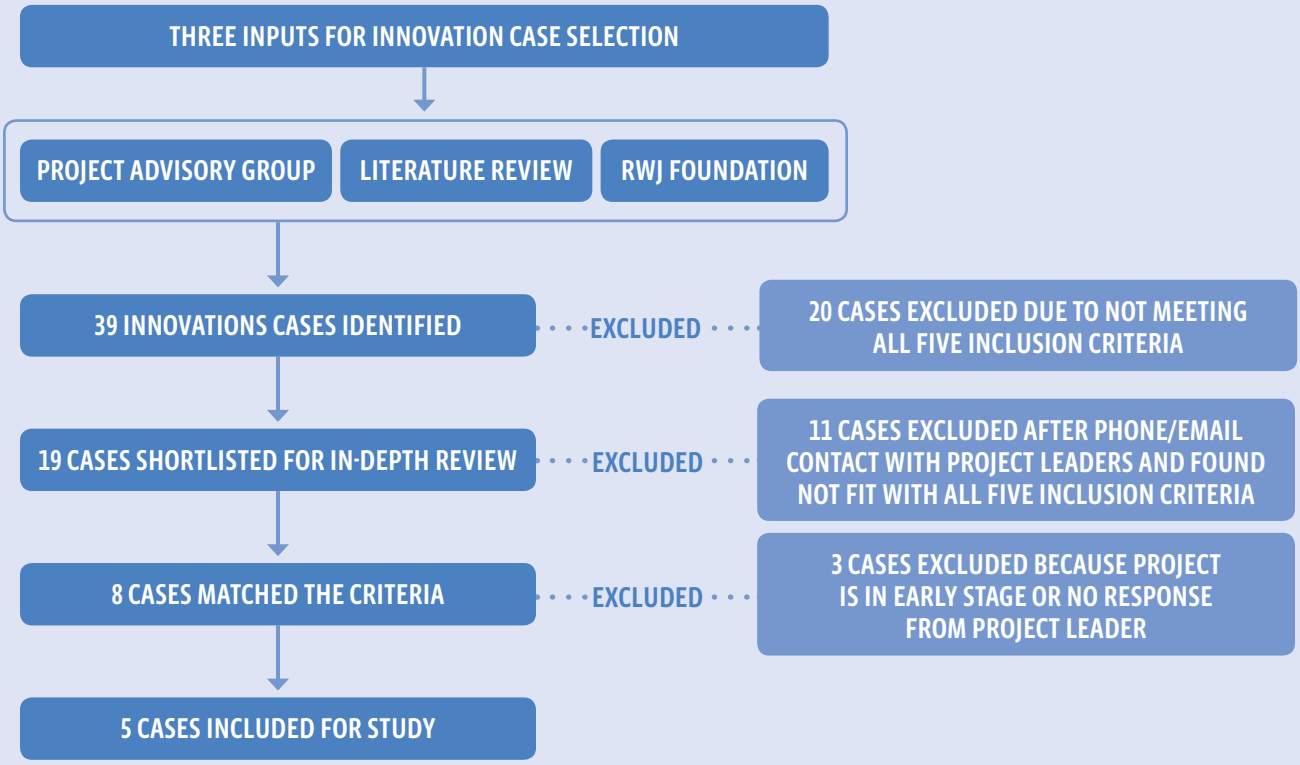
Given the broad set of influences on what contributes to a culture of health in a community, we did not seek to derive a final set of innovations that were highly similar in other dimensions (such as all having obesity prevention objectives, or all meant to be implemented in health care settings). Rather, we left other dimensions open so that our final set of global health innovations might come to comprise what Przeworski and Teune (1970) describe as a "most different systems" design for case study comparison. A set of cases that differ in important regards can provide a stronger test of a set of common concepts and the relationships among them.

An online coding sheet was created using the Qualtrics platform to document details for each candidate innovation, such as country of origin, demonstration of spread in the U.S., innovation objectives and description of operation, key organizations involved, and contact information. Through repeated meetings the research team discussed each innovation, with

[3] Paul B. Batalden, Professor Emeritus of Pediatrics, Community and Family Medicine and The Dartmouth Institute for Health Policy and Clinical Practice at Dartmouth Medical School; Kedar S. Mate, Chief Innovation Officer, Institute for Healthcare Improvement; Alexander Plum, Director, Development & Innovation, The Global Health Initiative, Henry Ford Health System; Nagesh Rao, Special Advisor, Inclusion & Faculty Affairs, Heritage College of Osteopathic Medicine, Ohio University.

additional preference given to innovations that had not only spread to the U.S. but spread to multiple implementation sites in the U.S. This process narrowed the number of candidate innovations to 19. The research team then contacted representatives of each of the 19 innovations to verify that the innovation had been adopted in the U.S. and that representatives were available and willing to answer questions about their experiences. This last step reduced the set to 5 innovations per Figure 4.

Figure 4.
Process for screening candidate cases of global health innovations.



The five global health innovations we selected to study are:

1. AgeWell Global. Originating in South Africa and with pilot implementations in Cleveland, Fort Lauderdale and New York City, AgeWell Global is a model of elder care coordination combining peer-based social engagement and mobile technology to improve health outcomes and drive down medical costs.
2. Cardiff Violence Prevention Model. Originating in the United Kingdom and with implementations in Atlanta, Decatur and Milwaukee, the Cardiff Violence Prevention Model provides a way for communities to gain more information about where violence occurs and how to prevent it by forming partnerships between hospitals, law enforcement, and community members interested in violence prevention.

3. Ciclovía. Originating in Colombia and having been adopted in many communities including Los Angeles, New Brunswick, Wayne County Michigan and Portland, Oregon, Ciclovía is a free community-based recreational program in which certain streets are closed temporarily to automobiles for cyclists, runners and pedestrians.

4. ConsejoSano. Originating in Mexico and now having scaled up in parts of California, Texas, Illinois and New York, ConsejoSano is a private company that contracts with health insurers and community clinics in the U.S. to help clinics convince poor community members whose native language is not English to come to the clinics for health services.

5. Swedish Rheumatology Quality Registry. Originating in Sweden and in the U.S. having been reinvented as the Swedish Quality Registry at Dartmouth College, this innovation enables both patients as well as health care providers to input information about a patient's progress in care. It involves patients with cystic fibrosis, inflammatory bowel disease, and other conditions through partnerships with disease-specific national foundations.

For each innovation we "built a case" according to the *case study method*, a type of structured qualitative analysis, in which we looked for information to assess the presence/absence as well as the importance of the components and sub-components in our conceptual model. We chose to build and compare cases this way because of the richness of explanation that qualitative inquiry enables, and the ability to combine and compare across cases (Yin, 2014; Stake, 1995; Yin & Heald, 1975).

The unit of analysis in a case study is the *case*, defined as an activity or event that occurs in an organizational context. An assumption of case study research is that the case itself cannot be understood outside of its context; thus, a holistic understanding of the factors that affect an activity or event is typically an objective of case study research (Ragin & Becker, 1992). A case may be written about or referred to as an intervention, a program, a technology or for present purposes, a global health innovation. Thus, the primary unit analyzed is not a patient, a person, an event or a document. Multiple sources are combined, each of which describes or concerns the same global health innovation, with the objective of combining multiple information resources to create one holistic portrayal. This composite set of sources of information constitutes a *built case* (Newig & Fritsch, 2009; Bullock & Tubbs, 1987).

Some of the factors in our conceptual model are readily mentioned or reported on in written documents, such as country of origin, the innovation's origin story, and the U.S. communities to which an innovation has been imported. Other factors of interest to us are not typically a focus in documents since they are process issues or process-related. These latter factors led us to include them in our semi-structured interview protocol.

INTERVIEW PROCEDURES

During 2018, we conducted telephone and video interviews about the five innovations with founders, international leaders, policy makers and researchers. We then scheduled and conducted site visits for interviews with implementers across the U.S. Some interviews included multiple interviewees at once. In total, we conducted 27 interviews with 45 interviewees (listed in Appendix D) via 4 telephone interviews, 9 video interviews and 14 on-site interviews. All interviews involved at least two study team members. A semi-structured interview protocol was used (Appendix C), and all interviews, except one, were digitally recorded and manually transcribed. Some interviews were video-recorded.

Interviewees were read or shown a consent statement and verbally consented to participate with digital recording. After introductions and a brief recounting of the purpose of the study, interviewees were asked several rapport-building questions about their existing positions and their role in the innovation. Then they were asked about factors in our conceptual model in relation to their innovation. This meant questions about the innovation itself (innovation attributes), key indi-

viduals and roles they played in spreading the innovation (linking agents), key organizations important to moving the innovation to the U.S. (inter-organizational partnerships), the approach taken to diffusion and scale up (pathways and strategies), experience with getting the innovation into the U.S. (receiving communities and organizations), and external factors (context).

Interview questions were primarily asked by senior members of the research team with several team members present to manage logistics, take notes, and ask clarifying or follow-up questions. Interviews lasted between 1-2 hours.

All procedures were approved by the Michigan State University Institutional Review Board.

DATA ANALYSIS PROCEDURES

While we used prior research and new thinking to draft our *a priori* conceptual model (a deductive approach to research), related research questions and semi-structured interview protocol, for purposes of objectivity we used an inductive coding approach known as thematic analysis to derive the data by which we would assess our model.

Thematic analysis is an analytic approach for identifying, coding and making sense of patterns within data without a priori categorization (Braun & Clarke, 2006). The combination of deductive (Boyatzis, 1998) and inductive (Frith & Gleeson, 2004) approaches to the comparison of concepts to data from text is a social scientific way of adding rigor to case study research (Yin, 2014).

After transcribing the 27 interviews, we had a total of 436 single-spaced pages of text to analyze. Three researchers each reviewed three randomly selected transcripts out of the 27 transcripts to identify major themes and subthemes that were common within the data. The themes generated in this portion of the analysis were not constrained by particular interview questions but were developed on the basis of responses given to multiple, related interview questions using the study research questions and conceptual model as a guide. Next, a codebook was developed and the themes were captured; it was used as the basis for reviewing all of the transcripts, allowing for additional themes to emerge. The three researchers reviewed 9 transcripts each and analyzed the themes and sub-themes in each transcript. Each entire transcript was reviewed and all data was identified as either connected to a theme or subtheme or irrelevant to the themes. A fourth researcher reviewed the raw transcripts (without the themes identified) and then reviewed all the thematically coded transcripts to understand specific elements of the responses in relation to the research questions posed in this study. Next, the major themes and subthemes and their relationship to the conceptual model were discussed by team members. Major trends in the data are described in the next section of this report in relation to the conceptual model.

Section 4.

Cross Case Study Results

Appendix B provides a one-page description of each of the five innovations we studied.

Here we report the results of our thematic coding and subsequent categorization of codes. We do this by addressing each of the specific research questions listed at the end of Section 2 that reflect the six factors of the Designing for Diffusion model:

1. Global ideas
2. Linking agents
3. Partnerships
4. Scale up strategies
5. U.S. adopting communities
6. Context

Then, in Section 5, we turn to more general conclusions and a set of recommendations.

GLOBAL IDEAS

How people perceive and talk about global ideas affects both what they will decide to do about them and how others in turn perceive them. The perceived characteristics or *attributes* of innovations play a key role in the ways in which ideas spread.

For all of the global ideas we studied, we found a consistent appreciation for the importance of (1) a positive benefit/cost assessment, and (2) compatibility. Interviewees talked about these attributes as essential to the diffusion and scale up challenge. Indeed, their characterization of these attributes is almost as a given, or an assumption, that an innovation must satisfy these requirements in order to have a chance at being adopted and implemented by others. Other attributes mentioned regularly by interviewees include trialability, simplicity, and observability. External validity and stigma were raised only rarely in the interviews.

Positive benefit/cost assessment. There was a sense among interviewees that while the importance of different characteristics would naturally differ given the varied forms and functions that innovations take, when those benefits/costs (i.e., pros & cons) are considered together, the qualitative calculation had to be, on balance, positive. This positive balance could be achieved in different ways according to the innovation in question. For one innovation, cost might be negative but observability a strong positive; in another case, cost might be perceived as low but trialability not possible. What was essential was that when a potential adopter thought about an innovation, the positives had to outweigh the negatives. In the diffusion literature, this comparative sense has usually been summed up as "relative advantage" in that a potential adopter considers an innovation in light of her current ways of achieving the same objective; thus, the innovation needed to be perceived as holding an advantage relative to an in-place alternative. Relative advantage was often conceptualized as

something "better than" which usually meant higher quality or effectiveness, and lower cost in monetary or nonmonetary terms. It is worth noting here that higher quality or effectiveness is the usual framing that scientists and researchers use to advocate on behalf of a new treatment, practice, drug or technology, often without consideration of cost. Here's how an interviewee said he talks about the Cardiff Violence Prevention Model when he describes it to other people:

"The first one would be: I am a clinician and I and my colleagues treat, you know, tens of thousands of people injured in violence every year in the U.K., so, prevention is better than cure. And then, the next argument I would always use would be that the police don't know about three quarters or at least half of all these offenses. So that's a powerful argument to get going with this. And then I suppose thirdly it's the evaluations, the published peer review evaluations show that this model results in very significant reduction in violence of about 41% measured in terms of hospital admission, or serious violence reported to the police, numbers of people coming to the ED. And then of course, there is the cost benefit as well, which you all know probably by now, the health economist at the CDC evaluated independently. I don't know if those attributes are enough, but otherwise, we just say this is a new way of preventing violence and that is going to be in all our interest."

For the Cardiff Violence Prevention Model, in terms of non-financial costs, the primary issue discussed by several participants was front-line staff willingness and ability to collect the necessary data due to concerns about patient care. Several people indicated that nurses view "box ticking" for data collection as detracting from patient care and this, combined with the nature of the data systems for collecting the data, is impacting data quality. Interviewees identified low financial *costs* as a key to diffusion in the U.K., but possible costs (and lack of funding for sustaining the innovation) was identified as a key factor limiting diffusion in the U.S. Several people with Cardiff indicated that there is little financial incentive for hospitals to adopt the innovation, yet, the public health *benefits* of identifying and reducing violence were discussed by all participants as being very important and *compatible* with the values of people within the organizations connected to the innovation.

Interviewees identified low financial costs as a key to diffusion in the U.K., but possible costs (and lack of funding for sustaining the innovation) was identified as a key factor limiting diffusion in the U.S.

The costs and benefits of Ciclovía were highlighted throughout the interviews; many of these are unique to the city in which the program occurs. The benefits most commonly identified include: population health benefits associated with physical activity, air quality benefits of reduced cars, the belief that Ciclovía events can heal social rifts across a city, reclamation of public spaces, moving people into places they would not normally go (and the associated benefits to business there), and bringing groups together who had not connected before the program was in place. One leader in the Los Angeles version of Ciclovía, CicLAvia, said: "I think it was also during a time earlier on, let's say 2011, that folks begin to look at the distinct benefits and which buckets Ciclovía could fall in. And certainly, bikes and advocacy around bikes and bike lanes is the obvious bucket. Another bucket that emerged out of it was this notion of economic development because when you have that many people in the street they are going to spend money. Another bucket was: People were actually moving, some of them were actually sweating, and therefore there was a natural public health activity exercise piece."

For Ciclovía, the primary costs described by our participants were financial costs borne by the organizing entity (often the city) to hold the event and perceived costs to businesses in lost revenue due to customers being unable to drive to or park near those businesses during the Ciclovía. An additional cost described by participants was the energy to sustain the necessary staffing, leadership or volunteers. In terms of the costs to hold the event, these are costs connected to the need to block streets and pay police to monitor the event. These were described by several interviewees as a major hindrance to multi-event adoption and why the program has been scaled-back, or never scaled-up, in many cities. This is partially a policy issue and partially a social (culture of lawsuits, fear of car-bike accidents) issue.

One researcher in assessing Ciclovía said, "...they have to put real barriers in the side streets. I don't think they can just put up a string or something. We had things where like cars could be driving to a farmers market on a closed street and kill people. There are a lot of fears, things that probably rarely happened, but they still want to be prepared and prevent those events. In their view, they need a lot of police. I know in Bogotá, they have all volunteers and their expenses are very low for 70 miles of their Open Street event. I think the barrier is the cost, interruption of the routine traffic patterns..."

"We have uniqueness here," said one Wayne County Ciclovía leader. "It really doesn't cost us anything."

In Wayne County, outside the city of Detroit, leaders did not describe Ciclovía costs as a hinderance. This was because of the venue they chose for the Ciclovía: A six-mile long parkway that runs through Wayne County and doesn't have many businesses along its route. Also, leadership had institutionalized the weekly set up and breakdown of barriers into the regular job duties of its parks and recreation staff. "We have uniqueness here," said one Wayne County Ciclovía leader. "It really doesn't cost us anything. We don't have a lot of difficulty and have been doing it for a number of years and people basically look forward it, May to end of September, every Saturday from 9 to 3:30 pm, I can come out, walk, bike, whatever I want to do and don't have to worry about any cars."

Costs and benefits addressed in the ConsejoSano interviews centered on both monetary and non-monetary benefits of the innovation. The benefit most often highlighted was that ConsejoSano takes a customer service approach to providing health information and services to low-income people who have historically had poor service in the health system thereby filling a gap. A second benefit described regularly by participants is that ConsejoSano created a mechanism for low-income Spanish speakers to enter the healthcare system in a way they have not in the past. Financial aspects were discussed mainly in terms of overall reduction of health care costs, with ConsejoSano as a cost-effective mechanism for the reduction of emergency room visits due to the increased provision of preventative information to hard-to-reach populations. ConsejoSano is working to combine technology and human communication to get to a point where the communication is optimally effective, and the company derives a profit.

One ConsejoSano leader said: "I think we got a lot of questions because there are not many companies that combine both technology and service. So, the human connections, especially in a cultural context, simply can't be replaced. Many of our investors who would like to see a technological solution to the problem of health access for Spanish speakers are concerned about the economics of coupling the technology with a service. I think we've been fortunate to receive support from investors who are open-minded and who have experience building service-based businesses, but we are really a hybrid of a technology and a service.

"The way insurance works, you receive a certain amount of money for services you're providing, and you try to provide services that are needed, but at the end of the day you're trying to make a profit in most cases, or at least trying to have an operating margin. That inherently has some conflicts for a patient base that has a tremendous amount of need. So, when you're optimizing around and trying to create a surplus of money when you actually need all of the money available to serve patient's needs, it just becomes difficult metrics. The pressure on these organizations is high when it comes to quality measures. So when they encounter an organization like ConsejoSano, they really want proof that it works."

The Swedish Quality Registry was described by research and implementation team members as having short-term benefits for participating patients who can interact with other patients in ways that are not normally possible, and also having short-term benefits for providers who are not normally privy to so much encoded information about their patients. The registry also has the long-term potential of building a learning health system for patients and providers for each disease to which it is applied, since data-collection and research potential are built into the system. The registry was discussed as a way to bring the benefits of facilitated networks to healthcare and enabling better patient relations for providers. A

team leader at Dartmouth described it this way: "What I try to do is to say that if the person is familiar with registries, that there may be a way of operating a registry that can be more valuable. Then, I explain the Institute of Medicine learning health system idea. And, if people that are sort of in the registry camp, they appreciate this idea that every patient can benefit from the best available evidence and every patient can contribute to the next generation of evidence. And so, this idea of a learning system that helps me and helps create new learning is very attractive to some people. And let's create a registry-based learning system that has two-way benefits for the patient today and for research and science tomorrow. If we're talking with a clinical program leader, I think the benefit is a merger of pragmatic research and real-world research.

"If it's a clinical program leader and they are on the side of that curve where they recognize that they may not be the best even though they would like to be the best, there is an opportunity to learn from similar programs treating similar patients so that as a provider you can improve, and so comparative benchmarking can be done for learning, which is a real attraction. The third hot point for some people is that most clinicians really mean to partner with their patients, but they haven't found a way to literally optimize their patients' health outcomes and to do that in the smartest possible way."

The benefits to patient care were highlighted by a member of the Dartmouth implementation team: "I think one of the things that, if we look in on what we've been doing, rheumatology, IBD [inflammatory bowel disease], CF [cystic fibrosis], are all chronic conditions with a different value statement. They have these really high cost medications. Those organizations are really trying to save lives and they need good information to be able to develop the best interventions. That's why I think the CF Foundation has been so successful. They really have got an incredible asset in all of their data and the system they've built."

For AgeWell, interviewees emphasized the benefits of the innovation to seniors, to the care teams, and to the families of patients. "There were three benefits, maybe even four," said an Age Well leader. "One, certainly to older adults who would be the service and care recipients; the second would be to the care providers, the care givers who would be the AgeWell companions who are employed in that role; the third would be to health systems who would be able to reduce their healthcare costs; and the fourth would really be the community where adults live and in many respects, their family members who would benefit from having the comfort of knowing that someone is there caring for Mom or Dad. So, we have gone beyond the single dividend to a quadruple dividend to all these different entities. And the notion was to take what we had done in Africa in relation with HIV and build a program that had application globally."

These benefits were also discussed by AgeWell implementation team and health system team members. Said one, "We don't see the patients in their homes as we're following them for the 90 days, but having that AgeWell person as someone in the home and bringing up things that you know the patient wouldn't tell us hospital employees, they don't think to say 'Oh, my [air conditioning] is broken' when they are telling us how they're doing."

A discussion of the benefits of AgeWell from another participant reinforced these points: "The 'seniors helping seniors' component played out as we had hoped it would. What actually happened was that you could see that there was a much quicker trust and respect relationship built between the patients, and they called them 'Agewellers,' the person who is going into their home. That was much faster and much deeper. We did not study that particularly, but just objectively, experientially looking at that, there was a deeper relationship between the patients and the Ageweller going into their home than we see with our public help or home help agencies going into their home. Part of that we think was just the similar age so that the senior actually trusted that person of being more similar to themselves when they

"Many patients offered to pay for the service, or their family members offered to pay for that service to continue, which was reflective of the level of trust and the relationship they formed."

presented at the door than a 25-year-old or 30-year-old nursing assistant for example from a home help agency coming into their home. So, we think that was a big difference. We based that partially on the response by patients at the end of the time period that they had the Ageweller with them. Many patients offered to pay for the service, or their family members offered to pay for that service to continue, which was reflective of the level of trust and the relationship they formed over that 90 days of service. "

Another participant highlighted the benefits of AgeWell and addressed its compatibility with the system: "I think when it was time to wrap-up the program. I know there was a lot of melancholy because the program had proven to be a success but we stopped it. Especially when we're looking at the issue of social isolation for our patients and they see a social issue why we really started and why we were looking into to have such a program onboard. So, now the team here, I think we do a great job as a hospital to really incorporate any value system that we see or any program that is introduced. Really, this is a good testing ground for those projects. We really worked very well together."

Compatibility. The compatibility of Ciclovía with community practices and values was discussed in-depth by all participants we interviewed. Ciclovía is seen as compatible with peoples' (certainly the organizers') desire to reduce motorized transport use and increase physical activity in their city, their value on environmental sustainability (this was mentioned regarding CicLAvia in particular), and a desire to ride bikes to "reclaim" city streets from cars. Conversely, the incompatibility of biking with existing practices seemed to be a key to the scale-up in a high traffic city like LA. For example, a public health researcher said: "There's something really liberating and empowering to being able to walk down the middle of the street that everyday you're fearful for your life along." This dynamic is one of the most interesting aspects of the success of Ciclovía in certain places – our interviewees believe it tapped into a latent desire by people to reclaim their streets and get out of their cars. That is, it was Ciclovía's *incompatibility* with the status quo that made it appealing. It was radical, but also very occasional.

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With ConsejoSano, compatibility with culture was an overarching attribute important to the leadership team. The compatibility of ConsejoSano with patient needs and cultural values, existing behaviors, and characteristics of the system were highlighted as a key characteristic of the innovation. The underlying premise of bringing the innovation to the U.S. was one of compatibility: *Cultural* compatibility with individuals in need of health services, and *business* compatibility with the payers of care.

In the early days of ConsejoSano, leadership marketed the service directly to employers as a way to cut their costs by getting low-income workers to engage in preventive health care and thus be less likely to need costly procedures later. As one interviewee said, "The corporate clients saw the wisdom of it. They were like, 'this is great because it meets the needs of our employees. It solves the problem of giving them advice that can lower costs dramatically.' Although initially this involved language issues, it later evolved to encompass core cultural values." Several interviewees addressed the fact that compatibility at the surface level of language is not their only focus; they aim for compatibility with core cultural values as well. One leader at ConsejoSano discussed this at length: "Translation is when you take a message that is written for you and I want to send the same content I'm trying to get you to do something, to take an action like you come in for a mammogram, for a prostate exam – so I design, I write a message for you. You may be an English speaker who has come from a traditional English American background and culture, and so translation is that I take the message that's written for you, that's designed to try to engage you and I just translate it and I send it to you even though you may come from a radically different culture – you don't speak the language – there may be cultural norms there that if it's a breast exam I need to take into account. And so, what we do, we call it community detailing – here are the people that we need to reach - and where do they live and what do they believe and how do they live and where are their biases, where do they come from, what language do they speak. That's the best way to communicate with them. We micro-segment based on that."

For ConsejoSano, compatibility was also discussed in terms of the technology used to connect with the people they serve, particularly moving from the voice mobile phone model used in Mexico to the use of SMS in the U.S. "We think SM text messaging is the best way to reach these populations that we're trying to serve because they're very comfortable with it," said one leader. "It's low cost and this is the way they communicate. They prefer to communicate that way, but it doesn't always work. There are certain people for whom it doesn't work and as we start to do some Medicare Advantage work to deal with that. There's an older population and for some of them, text messaging is not their preferred way to communicate."

"People have begun to expect a different consumer experience because of what's happening in the rest of society, said a ConsejoSano leader. "I'll give you an example. I use Lyft, Uber, Airbnb, Netflix and Amazon. These are services that have almost no 'friction.' They have figured out how to make the transaction so easy. They don't make me wait in line. I can call Lyft or Uber right now and they will be at the curb before I can get downstairs. I know where it is, I can pay for it in a smooth way, I can schedule it in advance. I mean, these are all things that we have come to expect in the rest of society. Health care is stuck in the 1970s."

For the Swedish Quality Registry, *compatibility* was highlighted in all of the interviews. The project leaders at Dartmouth discussed the ways in which having a user-centered design process contributes to compatibility. A participant from the Dartmouth group said: "I think we've been trying to keep the importance of each stakeholder in mind in terms of this isn't being designed just to fill patients' needs, not being designed just to fill clinicians' needs. There's going to be a lot of different folks who interact with this. The most important thing is the relationship between patients and providers but there's also care team members and others." For the Swedish Quality Registry, an important compatibility challenge raised by one interviewee is that the entire system is in English, which would reduce utility at sites where the patient population has limited English language ability.

For AgeWell, incompatibility as well as compatibility was discussed. It was pointed out that the model was designed originally for community settings and its movement into acute care was challenging largely due to problems with implementation of the program. One person stated: "AgeWell started in the community, it's really a community program. So, it was new for them being in an acute setting. The hospital setting was new. There are a number of things that we ended up changing and modeling differently and actually testing because they hadn't done it before. So, our model was one where they recruited a case manager. Initially what we wanted was to have case management be a part of our community outreach, but then we realized that they really needed someone who had more availability on weekends because that's the model that AgeWell has. It is a seven day-a-week operation that they run. So, there were two people, a site coordinator and a case manager."

Other attributes of the five innovations. *Simplicity* is often strongly and positively associated with the decision to adopt an innovation. Its importance was noted by our interviewees, too. For example, simplicity was discussed in terms of the ease of using the initial ConsejoSano services. "Our service allowed anyone in the U.S. to tap their phone and within 10 seconds they were talking to a native Spanish-speaking doctor," said one leader. "24 hours a day." The new version of ConsejoSano with text messaging is similarly easy to use.

Trialability was addressed by one of the ConsejoSano staff in terms of creating opportunities for clients and key stakeholders to test the SMS service. "I set up a test campaign and I set up my phone and I also set up the phones of some of our key stakeholders as well. I started sending out these messages to their phones. They were able to see the message and interact with it on their phone, and they could see how the auto reply works and how good it is. We set up different responses based on the inbound message that we might get from a member or patient."

The Swedish Quality Registry was evaluated highly in terms of trialability. The registry was designed to be "co-created" and as such, *trialable* by stakeholders/potential users prior to implementation. For example, one participant from the Dartmouth group said: "Since we have some local implementers, it's not like we're working with people far, far away. It's like we're right here locally, trying to build something and test it. We can test and refine, test and refine before we go to the next person and be like, 'try this.' We can do small tests of change and learn quickly, really quickly. Like I can go down to the clinic and watch and say, 'That idea was terrible. What were we thinking?' Which is very, very valuable."

"We can do small tests of change and learn quickly, really quickly. Like I can go down to the clinic and watch and say, 'That idea was terrible. What were we thinking?'"

Ciclovía is seen by interviewees as very trialable for city leaders who are considering adopting the model. They can commit to just one Ciclovía event, at reduced scale as a pilot, and then take stock of the experience. This helps overcome the sense that the planning and inter-organizational details are too complex. One leader in Wayne County, Michigan, said: "And I like his [an international spokesperson's] approach. He said, 'Quit discussing, just do it!'" Another Ciclovía leader said that the perceived *complexity* of a Ciclovía event is overstated. "You don't shut down the city when you do Open Streets," he said. "People do stop for the main intersections, but you only close the small streets. The city can continue operating as normal and people can still go to church if they want to go to church."

Ciclovía interviewees considered *observability* to be another major explanation for its spread. Ciclovía is highly visible and experiential; thousands of people in open streets, walking, talking, sightseeing, jogging and bicycling. Many interviewees said that they were inspired to start or get involved in a Ciclovía in their city of residence after attending or seeing a Ciclovía in another city. In some cases, this happened serendipitously while visiting a place where a Ciclovía was being held - studying abroad in Bogotá, Colombia, for example. In other cases, individuals or teams visited other cites specifically to observe or participate in a Ciclovía.

Observability meant something very different for the Swedish Quality Registry, where the innovation was discussed primarily as enabling users to see data reports and interfaces in a way that is superior to existing data systems. The people we spoke with regarding implementation discussed strategic efforts to communicate those data to people at the sites. "There's a lot of hunting and gathering in today's medical records," said one leader at Dartmouth. "And the idea about good data is honored but it's hard to get, and so the dashboard effect, if it's co-designed by the end users, has a lot of innate appeal because it makes it easier to get that history that's relevant but that you rarely have. Then, there's the subjective information that is the patient reports. The so-called objective data are the clinical data. There is a lot of stickiness that is quite attractive if you can get the IT [information technology] to fit well in the real work environment."

Stigma as a barrier to adoption. The issue of *stigma* was rarely raised by interviewees. For the Cardiff Violence Prevention Model and the Swedish Quality Registry, interviewees said stigma was not an issue. For Ciclovía, there is little evidence to suggest any stigma regarding country of origin (Colombia) attached to the concept or the name Ciclovía (or its variants such as CicLAvia in Los Angeles). Several of our participants talked about the label "Ciclovía" as a positive and a negative. They indicated that using the Spanish is inclusive in cities with diverse populations; in other cases, it is off-putting to people who don't know what it means. One interviewee thought that the name sounded like a disease. Another interviewee said "I don't think it matters. I think people just look at what it is, and if it means something to them, I don't think it matters where it comes from. It looks like fun, so they go for it. I don't even know if Americans know which countries are low-income or high-income to tell you the truth. They have no idea. They are so insular. L.A. is different because half of people are coming from low-income countries. They are coming from Mexico and Central America, so the immigrants, they are not going to be prejudiced. If you're just talking about Americans in general, I think most of them are not really aware of how people are living everywhere else."

Stigma was important for ConsejoSano, another innovation from Latin America (Mexico), but not in the ways the authors of this papers anticipated. First, ConsejoSano was born out of HIV stigma – one of the leaders of the model initially worked for PEPFAR in Mexico, which then evolved into a company that provided employee health care. Second, the country of origin actually functioned as a positive to ConsejoSano clients because of language issues, but functioned as a negative for Medicare because the use of Mexican doctors was not allowable for Medicare reimbursement. (The U.S. version of ConsejoSano was created in response to this issue.) Third, one interviewee said that the larger stigma of the U.S. healthcare system as not being hospitable or helpful to poor people worked to ConsejoSano's benefit as it spread.

"I wanted to bring this from Africa to Europe and from Europe to the U.S. to find an acceptable way into the U.S. market."

Stigma was not perceived to be much of an issue by AgeWell leaders, though they had anticipated it as a possible barrier. "If you want to try, as a business coming from overseas, you need to convert a story into something that business entities are interested in as having U.S. or Global North capacity," said one AgeWell leader. "Succeeding wonderfully in Africa is not necessarily something that is going to drive investors to say, 'This is something I believe in.' They are going to say 'Prove it works somewhere in the Global North.' America does not necessarily believe in things European. I mean, how many drugs have been approved in Europe that have not been approved yet by the FDA? So, we are somewhat xenophobic in the States in not trusting applications or programming activities from anywhere other than the U.S. For that reason, almost incrementally, I wanted to bring this from Africa to Europe and from Europe to the U.S. to find an acceptable way into the U.S. market."

External validity. We had expected that the extent to which a global idea had been successfully adopted and implemented in multiple countries would be important to interviewees. That is, perceptions of a health innovation that had only been demonstrated in one country might be less positive than for a health innovation that had already spread to 40 countries. Mothers 2 Mothers, the South African HIV prevention program that was reinvented into AgeWell, is in use in many countries. Ciclovía has been adopted by cities throughout the world. AgeWell has not diffused in the U.S., but Ciclovía has. However, interviewees did not emphasize external validity as a key to successful adoption in the U.S.

Summary about the attributes of global ideas. These data show that (1) a positive benefit/cost assessment, and (2) compatibility were the attributes most often addressed by our interviewees as essential to scaling up innovations that could then diffuse in the U.S. Trialability, simplicity, and observability were also discussed regularly as key to scale up and diffusion. External validity and stigma were raised only rarely in the interviews.

LINKING AGENTS

Linking agents move information, often through their existing relationships that can tie together cities, states and countries. Effective linking agents act as bridges that span real and perceived gulfs that often stymie the diffusion of innovations.

Movement of the Cardiff Violence Prevention Model, for example, was initiated by a contract between two researchers. Publication of the first results about the Cardiff Model in an academic journal by a professor at Cardiff University led to an inquiry from a professor at the University of Pennsylvania. That professor in Philadelphia communicated with a former student who worked at RWJF, who brought news of the Cardiff Model to the Foundation. This information led to a grant. This person-to-person-to-person communication led to the transfer of the Cardiff Model from the U.K., with the eventual hosting of the model in the Division of Violence Prevention at the U.S. Centers for Disease Control and Prevention. The CDC then became involved and facilitated the initial trials of the model in the U.S.

In the case of Ciclovía, initial linkage was accomplished by members of the international biking community and city officials in various U.S. jurisdictions. Bicyclists saw Ciclovía events as a fun way to "take back the streets" and ride in large groups without the dangerous omnipresence of automobiles. In 1995, a charismatic and vocal champion began advocating in North America for adoption of the Bogotá-based Ciclovía weekly events. A Ciclovía is an example of a *multisolving innovation*, which addresses climate change mitigation and adaptation objectives while achieving complementary objectives of physical activity, social inclusion, and other outcomes (Sawin, McCauley, Edberg, Mwaura, & Gutierrez, 2018).

"One of the key milestones in getting Open Streets off the ground was an Open Streets Summit we held in the Fall of 2013, which is where we had [leaders in the Ciclovía movement] speak, as well as someone from our Department of Transportation," said a Ciclovía advocate in Toronto. "We also had Curt Harnett, a Canadian racing cyclist and multiple Olympic medal winner, at the summit. We had been trying to connect Open Streets to the city as a legacy project in recreation and public health. We had all those folks in a room together with community members, talking about the wonders of Open Streets. We had speakers from New York and Los Angeles who brought a lot of experience."

Key individuals as linking agents were also critical for ConsejoSano. "We had a person like that, a medical doctor who is now on our board of directors. He is by ethnicity Polish, but grew up and was born in Mexico and immigrated to the U.S., and has been living in the San Diego area for 30+ years. He is the Chief Medical Officer of an FQHC [Federally Qualified Health Center]. He was introduced to us through our president and became a champion and supporter. He really helped, especially in the telehealth version of the company, in the very earliest days, and helped to think through and organize a lot of the cultural aspects of the business. Of course, in that version it was related to the Mexican call center. But then in the new version of ConsejoSano, the FQHC became a customer of ours. They have about 30 clinics in their FQHC network. That CMO continues to be a champion and a clinician who understands our work."

For the Swedish Quality Registry, organizational relationships between research institutions were key to initial diffusion into the U.S. Researchers were key here, just as they were in the case of the Cardiff Violence Prevention Model, but the Swedish Quality Registry effort involved more team members at the Karolinska Institute in Stockholm and at The Dartmouth Institute for Health Policy and Clinical Practice in Hanover, New Hampshire. The Dartmouth team realized that the idea of a personalized health information platform to which patients and their providers could contribute and use for shared decision making could be attractive to disease-specific foundations, which had reach to thousands of patients with the same disease. So, as Karolinska and Dartmouth formed the initial linkage to move the idea to the U.S., Dartmouth then began discussions with private foundations dedicated to particular diseases. Soon, customized versions of the Swedish Quality Registry were in process with the Cystic Fibrosis Foundation, the Arthritis Foundation (for rheumatological disorders), the Crohn's & Colitis Foundation (for inflammatory bowel disease), the Moore Foundation (for palliative care) and other potential sponsors.

So, as Karolinska and Dartmouth formed the initial linkage to move the idea to the U.S., Dartmouth then began discussions with private foundations dedicated to particular diseases.

A leader at Dartmouth involved in the project discussed tapping into his own extensive network to spread the Registry concept. "It's an old network of friends starting something new. The coproduction idea, that ideally patients coproduce their care experience and have a lot to contribute, when fused with the learning health system notion that electronic resources can be built for research and practice improvement, underlie all this work and has become a key theme for The Dartmouth Institute generally."

AgeWell is another case in which organizational presence, not just the people concerned, propelled interest in the U.S. But whereas the Dartmouth team pursued organizational relationships at a national scale with disease-specific foundations, AgeWell leadership brokered one-on-one relationships with health systems, academic medical centers and community-based organizations in specific cities.

Summary about linking agents. For all five innovations, *linking* agents played a key role in the movement of innovations across geographic locations. Most innovations moved to the U.S. through organizational linkages: Researchers affiliated with universities, or city officials, or funders with contacts internationally as well as domestically, and private companies that brokered relationships with healthcare organizations.

PARTNERSHIPS

In none of these five cases has a single organization successfully realized their project alone. They all collaborate, both contractually and informally, with other organizations. Collaboration decreases the risk to any one organization, brings resources to a joint effort, and extends the reach of health innovations for greater impact. When constructing partnerships, most leaders look for complementary assets. In the case of the innovations we studied, a mix of community, national, and international partnerships were in evidence.

The inter-organizational partnership created on behalf of the Swedish Quality Registry is distinct from other partnerships studied here. There are local, national and transnational partnerships in place for this innovation.

The inter-organizational partnership created on behalf of the Swedish Quality Registry is distinct from other partnerships studied here. There are local, national and transnational partnerships in place for this innovation. Local partnerships include patient groups, clinical care teams, and IT departments in healthcare systems. National actors include funding agencies, registry advocacy organizations, and research organizations. The original transnational tie between the Karolinska Institute and Dartmouth College is maintained through continued research collaboration. The IT role was singled out by a Dartmouth leader: "The IT organization is an enabler and there is also the data holder, whether it be a registry like the Cystic Fibrosis Foundation registry or an electronic health record. That's a critical part of the whole IT system. If you don't have a good strong partnership there it's not going to take hold."

The Cardiff Violence Prevention Model benefitted from local partnerships that facilitated its spread in the U.K. These were followed by the beginnings of a national partnership in the U.S. facilitated by the CDC that has led to initial adoption here. Then, local partnerships for community-level implementation had to be created since this is very much a local intervention involving hospital emergency rooms, police departments and community-based decision bodies that can bring together bar owners, city council members, advocacy group representatives, church representatives, school counselors, public health officials and neighborhood residents. A grant from RWJF was also critical for the early work in the U.S. Like many other health program partnerships in the U.S., almost all the staffing and work occurs at the local level, with just minimal national-level coordination and technical assistance.

Ciclovía had more international and national involvement because of cycling federations and outspoken unofficial "ambassadors" (i.e., linking agents) who gave talks to cycling clubs and municipal leaders about how the intervention works. The program requires partnerships to adopt and implement. As with the Cardiff Model, interviewees affiliated with Ciclovía implementations described local partnerships that were essential for the required degrees of sponsorship, publicity,

outreach to businesses and residents along the roads to be closed to automobiles, information dissemination, volunteer recruitment and management, community involvement in refreshments and entertainment in the closed areas, and public safety.

Adoption and scale up within jurisdictions were accomplished through local community partnerships led by a champion and host partner organization. The nature and complexity of Ciclovía partnerships varies by community, with large cities being complex events that require professional event management and central involvement of many municipal units. A leader in Los Angeles said: "Part of the process was really making sure that the other departments, including transportation, sanitation, sewage services, rec & parks, and you can just keep going down the list, we are all on the same page. You essentially encourage that dialogue, and that's what we did, as a city. When you do that, you create a [real] partnership. Here at that time it all came together with the creation of CicLAvia as a non-profit." A researcher who had studied CicLAvia said: "[One person] was really key in the whole thing because he had very good relationships with different people in the city. I approached him because I am a researcher and I was interested in evaluating it, especially comparing what the Ciclovía could yield as far as physical activity compared to parks, which I have been studying for many years. He also liked the idea of getting data. So, he talked to people in the city and he got funding for cameras for enabling us to count numbers of participants."

A Los Angeles CicLAvia leader explained: "When the mayor and the council are behind you in concept, you have to operationalize it because otherwise no one else will. Whether or not you're running into problems, you're going to different city department leaders and if they know you don't want to do it, they will be like, 'Ok, you don't want to do it? Then we will do it this way!' You really have to be able to show them a different path of least resistance. Like at the end of the day, I need certain things to happen. If they are not going to happen the way that you want them to, then let's try to do them this way. And then you began to realize that, once we did it this way, everything turned around. Then you have to give credit to everyone that it was all their idea. You literally need equal participation and distributed leadership. That's the only way this stuff works. Otherwise, if you use the word 'I' in the way in which you move things, it's not going to go anywhere."

A private foundation and the nongovernmental organization 8 80 Cities were important in building awareness and excitement about Ciclovías coming to the U.S., partly by leading study tours to places like Bogotá, Colombia (the original home of the Ciclovía) and Guadalajara, Mexico (which also hosts large Ciclovía events). These visits serve as demonstrations of how global ideas actually implemented on a practical level, and give visitors the ability to ask questions directly of both intervention leaders and of on-the-ground implementers.

ConsejoSano, as a small private company, has settled on a partnership model with two very different types of partners. A leader explained: "We work with the fourth largest national insurance company in the country, that is, sort of, our national connection to the plan, but our work is done at the very local level with patients who live in communities that we spend a lot of time in to understand. We message them to encourage them to come in to their local public health clinic. That's the value we essentially offer that national partner, so we do feel we operate at both the national and the very local level. We are not doing any national branding strategy or marketing messages on television, or anything of that sort. All of our work is one-to-one with the patient or their family."

"We work with the fourth largest national insurance company in the country, that is, sort of, our national connection to the plan, but our work is done at the very local level with patients who live in communities."

In the U.S., AgeWell sought to establish pilot demonstrations of how it could effectively work locally by forming partnerships with community organizations serving seniors, and with health care delivery systems in those communities. These partnerships did not lead to sustained implementation of AgeWell nor its spread to other sites in the U.S. An AgeWell international leader said: "Surely, at the local level, we were working with community service organizations. If you distinguish between our customers and our partners, in South Africa, our partners would be community service organizations, they would program on our behalf, we would provide program management, we would provide training, we would provide our technology to these community organizations that would be our field services. By design in the U.S., however, didn't have a presence so we wanted to work with existing service organizations that were striving to meet the needs of seniors and were looking for other program ideas. This is what we've done in Ireland with a group called Third Age. So Third Age was already programming to seniors, they had national coverage, mostly working with telephone banks where seniors could call in and either get advice, or linkages or just talk to someone. Third Age was excited about exploring the possibility of supporting program activities on the field. So, what we have done with them is we have given them our technology, we have given them program support and this is supporting their efforts to take this to scale within Ireland. In New York, we worked with an organization called Henry Street Settlement; in Cleveland, we worked with an organization called Fair Health Partners; in Florida, we did this ourselves. We wanted in our partnership with Trinity Health to knock it out of the park. We made the investment in terms of program and management staff to double down on our bet there to get the best possible [health] outcomes."

Evaluation data about the Trinity Health AgeWell pilot were positive, and Trinity employees were impressed with the quality of training that AgeWell provided to the seniors who were hired to assist less-abled older Trinity patients. The business case results, however, did not show the cost savings for which Trinity leadership had hoped.

Summary about partnerships. Inter-organizational partnerships were a critical element in the scale up and diffusion of global ideas. In the case of the innovations we studied, a mix of community, national, and international partnerships were found. Local partnerships were the basis for implementation in organizations and in communities. National and international partnerships allowed for wider adoption by more sites.

SCALING STRATEGIES

Global ideas "arrive" in the U.S. by being communicated, transferred or otherwise promoted. The routes by which a global innovation developer and her expanding inter-organizational partnership manage scale up of an innovation have been described as pathways to scale up. Different pathways may be better suited to different types of innovations. Some pathways allow for steady control over how innovations are implemented in new sites. Other pathways do not but can more readily reach more sites.

In published literature, some partnerships pursue direct replication at each new adoption site in the belief that their innovation must be implemented in one proven way in order to realize benefits. Others allow for, or even encourage, local adaptations by ceding some aspects of delivery control to implementers to best fit local circumstances. Some partnerships aim to change or create governmental policy to provide for a sustainable funding stream. In questioning interviewees, we sought to understand their use of these various pathways to scale up and then resulting diffusion.

AgeWell took an affiliation pathway in coming to the U.S. and seeking partnerships with community organizations or health systems. That is, it trained people in the field in healthcare systems to implement the innovation. When Agewell moved to Ireland, the leadership took more of a distribution network approach to diffusion and scale up by engaging other organizations in the process. In Florida, AgeWell implementation team members talked about how AgeWell connected with

Trinity Health and ultimately ended up as a funded demonstration project there. "AgeWell came here through an innovation grant from Trinity from a competition," said one Trinity Health team member. "They applied for and won the grant. Their introduction to Holy Cross was through Trinity. When they came and we decided to roll the program out, it was an interprofessional team that was engaged. So, the case managers, nurses, the physicians, our leadership, our Chief Nursing Officer, our Chief Medical Officer, both inpatient and outpatient, our Holy Cross medical group practices, we would send out bulletins to all of them to let them know that the AgeWell program was on board and describe the kind of services that AgeWell would offer to our patients."

The strategy used by leadership for the Swedish Quality Registry was different. Leadership first relied on a dissemination approach to spreading the model, then converted to strategy that combined the importance of affiliation with interested partners and a distribution network strategy of seeking out national disease-specific foundations that could both fund a reinvention of the Swedish model to a new health condition but also provide credibility and access to a number of care sites nationally. "Up until now we've had a lot of organic growth—friends and colleagues we know have contacts," said one team leader. "My colleague is a great seller and has been able to articulate that. Once we do have someone who's interested in what we've been trying to do as in to use the product directors on our team, so we have a handful of conditions now that we are working with to use to field questions into a kind of guide for new organizations down the path as we are going."

For the Swedish Quality Registry, this affiliation approach to diffusion has become fused with an appreciation for the reach, funding and credibility that distribution networks can bring to the table. "There's going to be an opportunity, we think, with the Rheumatology Learning Health System Project," said a leader at Dartmouth. "At the Arthritis Foundation, they are starting to use the term 'facilitated network.' They did not use that term before. They have 30,000 very active users of their website and we think we can partner with use them as a reactor panel as we're working intensively with the pediatric and then the first three pilot sites to use these 30,000-network as a way of getting input."

The Cardiff Model initially used ad hoc dissemination activities to scale up, including publications and talks by leadership. The publications led to its initial introduction to the U.S. through research networks. In the U.S., loose distribution networks were key in initial adoption and spread. Reinvention to fit new systems in the U.K. and U.S. was described by most interviewees. This has involved changing who collects the data as well as accommodating different organizational structures and leadership from site to site. So far, only one site (Milwaukee) has implemented the entire program. There is no evidence yet that the program is being reinvented to address problems other than violence.

Ciclovía has had the widest diffusion relative to the other cases we studied. Cities all over the world now have Open Streets initiatives, with more than 150 locations in the U.S. The implementations of the Ciclovía concept vary widely in scale and regularity. In its early years (late 1990s to the early 2000s), Ciclovía disseminated by way of invited talks, advocacy, study tours, and meetings of city officials. More recently, Ciclovía has scaled up through an affiliation strategy as people and communities that have implemented Ciclovías provide technical assistance to new communities. Adaptation has changed somewhat across localities. "One of the things that I noticed very quickly in the U.S. was that participants were mostly upper middle-class and upper class, not lower income," said an interviewee. "I expected it to connect everybody [as Ciclovías have done in other cities and countries]."

For ConsejoSano, a variety of scale up strategies were used to diffuse/grow the business. The original business in Mexico was a distribution network comprised of a council of businesses formed in Mexico. Leadership also used a branching strategy to move the Medical Home innovation to the U.S. Now, the ConsejoSano strategy is again best characterized as a distribution network model but with different partners.

Reinvention of the innovation by leadership has been a hallmark of ConsejoSano as it has changed in several major ways largely to be compatible with consumer and health system parameters in U.S. markets:

1. Reinvention of the services they provide, from answering questions from individuals about health and disease to convincing under-served individuals to come into a nearby clinic.
2. Reinvention of the means of communication, from telephone conversations with doctors to text messages with ConsejoSano staff.
3. Reinvention of who takes the initiative, from an in-reach or demand-based model of service provision to an outreach or supply-based model.

A ConsejoSano leader said: "We changed our model a bit when we signed our first Medicaid clients. They were like, 'Look, we love your service because what you're doing is you're connecting with people culturally but we don't want you to use offshore resources.' In fact, just the opposite. Use the special skills you have, which is building a relationship with people around culture and direct them to our clinics, to our providers here in the U.S. So, we can close gaps in care and improve HEDIS clinical quality measures. So, they were like, 'we need you to get our patients to understand what they need to do, to navigate them in and build a trusting relationship with them, so that it's easier for them to access the care that's available to them through their Medicaid plan.' So, we shifted our model to focus more on S.M.S. text messaging and we're really now focused on driving improvements with HEDIS, closing absence care, increasing satisfaction and educating people about for instance the difference between the emergency room and urgent care. Emergency room is a thousand dollars, urgent care maybe 150, and a lot of things are more appropriate for urgent care. We educate people about that. So, that's what we do for health plan-managed Medicaid plans and also providers typically working for a health plan.

"We need you to get our patients to understand what they need to do, to navigate them in and build a trusting relationship with them, so that it's easier for them to access the care that's available to them through their Medicaid plan."

"You have to use technology," he continued. "We use technology for scale and but I don't believe in health care that you can ever cut out the human element completely. I just don't think that works very well. The key is to find a way to scale your technology, so that you only need human interaction as an exception, not the rule, and that's the way you scale. So if you can design the technology so that you're able to reach out and connect with people using technology that feels human, that feels like because it's so well designed and it's got components of machine learning or AI, that learns and in every interaction it gets smarter, then over time the technology is able to reach people and connect with them, and they will feel like it knows them because it's able to collect enough data and information to really interact with them in the way that feels comfortable. People want to be treated with respect. It really comes down to respecting that they're human beings and they have a life and a history and a background. If we can design the technology so that in 95 percent of the instances it's the technology that drives the action and customers are satisfied then it can work."

Summary about scale up strategies. The cases we studied commonly relied on the dissemination of information to generate interest among potential adopters about their innovation. The affiliate pathway to scale up was also used, as were partnering for access into distribution networks; i.e., organizations such as insurance companies and national disease-specific foundations that had broad reach to many localities. ConsejoSano, in particular, relied on reinvention extensively to adapt to changes in its context in order to scale up their service.

U.S. COMMUNITIES

The decision to adopt a global idea is sometimes made by a single stakeholder in an organization or a community. More common are multi-level adoption decisions, sometimes made conjointly, sometimes made sequentially, by a set of stakeholders. Adoption of the Cardiff Violence Prevention Model in the U.S. was facilitated by staff at RWJF and the CDC. Those staff acted as intermediaries to U.S. communities, through personal contacts. There is a degree of adherence required in the Cardiff Model in order to get the data required to draw conclusions about community violence. Emergency rooms need to collect data from the victims of violent injury about place of injury, time of injury and weapon, and communicate those data to police departments for a more complete mapping of violence that the police otherwise have available. Volunteer community groups need to convene to review the data and consider what preventive interventions might reduce the future occurrence of such incidents. Yet, there is leeway for communities that adopt the Cardiff Model to adapt aspects of it to be most compatible with local resources. Adaptability of the model may be one explanation for its adoption by communities. For example, in Milwaukee, nurses rather than front office staff collect incident data from victims, and a university-based injury research center receives the hospital intake data and cleans, analyzes, and maps those data rather than the police department having this responsibility. Grants have funded this work so far, but continued funding is unclear. Other sites in the U.S. are only at the data system development phase and have not yet convened community groups for decision making about interventions.

There is leeway for communities that adopt the Cardiff Model to adapt aspects of it to be most compatible with local resources. Adaptability of the model may be one explanation for its adoption by communities.

A team leader with the Medical College of Wisconsin's Injury Research Center said: "We've tried to talk about violence prevention through a public health lens, looking at things like the social ecologic model, understanding that prevention strategies can be implemented at community, neighborhood and individual levels. Just to kind of orient folks and get folks to start thinking about different types of prevention strategies that can be implemented based on the data that we've been looking at over the last several months. The information can be a little too 'up here,' a little too public health-y, or theory-based for some folks. So then a next meeting might be useful to bring it down and talk more concretely about injury as a disease, violence as a disease and sort of thinking about attacking, interrupting the disease, and the flow or the transmission of disease by some of these different prevention strategies. That makes it more real for folks."

Data are provided to the community groups for decision making about interventions but there is not an emphasis on data-collection for research purposes. "We fought loud and hard about this," said a Cardiff Model leader. "We've come to the conclusion that the best way forward is to say, 'You don't need to do an evaluation about this, those have already been done in a full controlled way and published in peer review journals, here is a systematic review by Peter Miller and Nick Droste in Australia, they published a systematic review on this. There is your evidence.' The challenge is to not re-invent the wheel or unnecessarily re-evaluate this. The challenge is to implement this with fidelity."

The history of Ciclovía in the U.S. is much more extensive partly due to many years having passed since its adoption into the U.S. Adoption has occurred largely in cities with implementation followed by the formation of local partnerships. Local adaptations by municipalities have been considerable, with sustained use in many jurisdictions. Process and outcome data have been used to promulgate spread and argue for its continuation.

Our interviewees said that Ciclovía's adoption was facilitated by its conceptual innovation, and by the observability of Open Streets events. Typically, a resident saw an Open Streets event somewhere else, thought it was a good idea, and took steps to introduce the concept to their city.

A leader of the Los Angeles CicLAvia initiative said: "Well, there are a number of our founders who have been part of initial adoption, not only the beginning of Ciclovía, but also, the evolution of it and how it actually has become this LA tradition. In 2009 or 2008, there were couple of groups from L.A. who went down to visit Bogotá. They saw Ciclovía and they were obviously not only impressed, but very taken by what it actually had done for that city. They came back to L.A. inspired and began to talk separately about "Can we do something like this in L.A.?" These are folks who had some level of advocacy in their background. Then these groups realized they were actually talking about the same thing and decided to talk to each other."

For Ciclovía, maintaining its core concept (that is, some kind of Open Streets event or series of events for non-motorized movement through a jurisdiction) for implementation while adapting to specific characteristics of a local community has been key for it to take hold globally. The desire for compatibility with community values and behavioral norms contributed to the adaptation of Ciclovía in Portland, Oregon, where city employees have used the Ciclovía concept (locally renamed Portland Sunday Parkways) as a means to achieve goals of inclusion and engagement with immigrant communities; One example is Portland Sunday Parkways' recurring "Walk with Refugees and Immigrants" series. Some implementing communities focus on cycling, some on jogging and running, some on whole-family participation, and some emphasize local business participation. There are also highly visible components such as Frisbee leagues, tai chi, yoga, and live music, which attract residents along Ciclovía routes.

The desire for compatibility with community values and behavioral norms contributed to the adaptation of Ciclovía in Portland, Oregon, where city employees have used the Ciclovía concept (locally renamed Portland Sunday Parkways) as a means to achieve goals of inclusion and engagement with immigrant communities.

Several interviewees discussed adaptation as well as the collection and strategic communication of evaluation data as keys to the sustainability of Ciclovía in their communities. Interviewees mentioned that this contributed to further diffusion of the program. Interviewees from multiple cites said that data showing involvement of diverse communities in both the planning and participation of events has contributed to the longevity of Ciclovía. Researchers with whom we spoke said that figuring out which types of data to collect about the program was an ongoing dialogue. Challenges to sustainability of Ciclovía include funding for logistics (particularly for blocking off streets), and the need for long-term involvement/engagement by community leadership. Public opinion and participant surveys, air quality monitoring, numbers of participants, business participation and effects on retail sales, and event costs are types of data that have been collected in U.S. cities in relation to Ciclovías.

In the case of ConsejoSano, adoption occurred in the U.S. due to the efforts of leadership. "Originally, we were thinking that if we could connect U.S. users to the existing MedicallHome call center, we'd have something pretty cool," said a ConsejoSano leader. "You'd have low-income Spanish speakers in the U.S. connecting with native Spanish speaking doctors on demand. So, I made a deal with MedicallHome, we launched this service, a company called ConsejoSano – it means 'healthy advice.' We weren't a true medical consultation service because the doctors were off shore they didn't have the right to practice medicine in the U.S. It was more 'healthy advice.'"

This barrier, combined with refusal of Medicaid to reimburse for the service, meant that leadership had to radically reinvent ConsejoSano into an organization that works directly with a health insurer to improve the communication with Spanish speaking members of the insurer who were not engaging in preventive health and not accessing health services in efficient ways. Process and Outcome Data are central to ConsejoSano operations. Data are collected about SMS messages, patient health conditions and patient actions in response to being contacted via text messaging by ConsejoSano, as well as a tracking of performance against Medicaid clinical quality measures.

"We visited care teams and patients in Stockholm, Gävle and Örebro.We mapped out the intervention's components and then did an environmental scan of what's happening in the United States and talked to lots and lots of stakeholders in rheumatology."

For the Swedish Quality Registry, adoption in the U.S. was initiated by personal contacts and facilitated by a site visit to Stockholm made possible by a planning grant. "The planning grant allowed us to visit Sweden and really think through how does the quality registry work in Sweden and would it be possible to replicate that in the U.S.? said a Dartmouth team leader. "At the time we were really thinking about rheumatology. We visited care teams and patients in Stockholm, Gävle and Örebro. We mapped out the intervention's components and then did an environmental scan of what's happening in the United States and talked to lots and lots of stakeholders in rheumatology." This deep understanding of the innovation enabled the Dartmouth team to understand which components of the Swedish Quality Registry were core to the achievement of its effects and which components might be altered to good effect. This they did through a co-design process, iterations of the dashboards, and inclusion of data elements that could add value for users. Issues of fidelity were often on team members' minds, partly because of the co-design process and how it values input from a diversity of stakeholders.

"When we started with this co-design process," explained a Dartmouth leader, "We looked first at what they were doing in Sweden with their rheumatology patients with the dashboards, and what the principles are there. What are their patient reported outcomes? Clinical outcomes? Treatments? How are these represented on the point-of-care dashboard, the self-management dashboard? And then: How would you design this for your population back home? We have basically added the notion of 'start where the patient is at, understand their goals, understand their concerns, understand what they'd like to get out of each visit.' So that becomes a fourth principle of the adapted intervention: Clinical outcomes, patient reported outcomes, treatment points in time, over time, and patient goals and concerns."

The leadership team described the intervention as being implemented across time and sites with little modification to the four core concepts but considerable adaptation to account for the co-design process with each new set of disease-specific set of partners and the particularities of each disease. The Dartmouth team said that both the process of creating the data system and the components of the data system/dashboard changed for different groups. They emphasized the need to continually reassess the tension between fidelity and the frequent desire for tailored data systems at each site.

As one project leader said, "We have done this differently with each of the partner organizations. For instance in the cystic fibrosis work that we did, I led co-design sessions probably for about three months with a group of 20 people. A third of them were patients, two thirds of them were care team members, so probably half the care team members were physicians and the other half were nurses or registered coordinators or somebody else on the multidisciplinary team. And we met weekly for three months trying to map out what was important, what were our aims, what are we trying to accomplish. We kind of followed the model of improvement using PDSA cycles: What are we going to test? How will we know we are effective? What data elements do we care about? How are we going to know what those data elements are? Which of them do we need? We've been through voting processes where we extended the process. We sent out surveys to the adult patients through the CF Foundation and asked for input about what we've been developing. We had people come up with the names for what the platform should be called. They voted on it. They went through a couple rounds of revision and decided what it should be, but the name is really a small part of it. That was the process we followed."

The need to involve collaborators and customize the intervention to health condition presented challenges. "One of the things that was really challenging in rheumatology but I bet we will encounter with other health conditions as we go forward is there's not a lot of standardization of patients reported outcomes," said the same Dartmouth leader. "There are six different ways of measuring the exact same thing and what you use depends on who you're training and where you live.

That kind of stuff is challenging to get a consensus. It was a little bit easier in CF because there was not as much developed and up-to-date around patient outcome measures and we were really trying to get at measures that clinicians would find understandable and easy to use as part of their review of symptoms before a patient visits."

A Dartmouth implementation team leader talked about challenges in relation to technology. "We're learning as we go. There have been some barriers that were frustrating related to technology, related to timing, that diverted our momentum. But that said, I think those sites are very invested in making this successful because they saw it from the beginning and they can see how far it's grown."

Sustained use was discussed by Dartmouth team members in terms of a will to continue and the resources for doing so. "We have our rock star sites that are just taking off, they're doing their small tests of change. They're our innovators. They're incredible and they're good. Then there are the sites that are laggards. They're just really not engaged, for many reasons. The will is there, they want to be part of this bigger thing. But the resources are a huge limitation."

For AgeWell, adoption occurred through funded demonstration projects. "In the United States, we did a community project in New York, which was very small scale but which gave us an opportunity to adapt our technology for a U.S. audience," said an AgeWell leader. "We also adapted what we're doing at the community level into a transitional care intervention in Florida and in Cleveland. The transitional care intervention was designed to reduce hospital readmissions. At the demonstration project in Fort Lauderdale in partnership with Trinity Health we were able to reduce hospital readmissions by 46% over 90 days post discharge."

For AgeWell, adoption occurred through funded demonstration projects.

Nevertheless, AgeWell has not progressed past the demonstration stage in the U.S. "My takeaway from this is if you don't know everything before you start with a trial, it's hard to learn the rules of the game while playing the game. We thought that having the support of the CEO and the head of nursing would be a path well paved, but the medical group was an obstruction. They did not want to see this happen, they had other interests, they had other efforts ongoing. They were not onboard. In most large systems, people are empowered to say no, but not yes. If you hit someone who says 'no,' that's the end. If you hit someone who says 'yes', it goes up to the next level of decision makers who start the decision process all over again. At that level, if you hit someone who says 'no,' you're done, if you hit 'yes,' it goes up to the next level yet again."

Implementation team members at Trinity in Florida said that AgeWell staff had been very accommodating in adapting the innovation to try to achieve a fit with the healthcare system. "The thing is," said one Trinity staff member, "AgeWell started in the community. It's really a community program. So it was new for them being in an acute setting. The hospital setting was new and different. There are a number of things that we ended up changing and modeling differently and testing because this was a totally new context for the AgeWell staff."

Another Trinity staff member said "The problem was that we had two programs at the same time. We had an AmeriCorps pilot program for seniors that had started in December. Then AgeWell was set to go live in January. Same patient population." Medical staff had already committed to the AmeriCorps pilot, which meant reluctance to embrace AgeWell. "We needed more time to set up AgeWell, and our planning for it came right during our high season, which was unfortunate timing. This meant that there were patients waiting that we could not sign up for the program because we were not ready to start."

"The disconnect was that we did not identify fast enough the strategic direction of our Community Health and Well-Being team," said a Trinity manager. "From the time that we started AgeWell, which would have been in the summer of 2016, until AgeWell ended in April of 2018, our Community Health and Well-Being senior vice-president left the company. So, they

did not have a senior leader for about four months. When they brought in his replacement, that person proceeded down a different route where he committed to a community health worker model—an alternative to AgeWell. I think AgeWell would have been scaled at Trinity if that would not have been the case, if we would not have already committed to our community-based model. And if it were AgeWell coming in to a place where we had nothing, we would have been eager to scale that out, but since we had already picked the community health workers, we did not."

Summary about U.S. communities. Adoption decisions, for the cases we studied, were generally done in a collaborative fashion with organizational partners. Implementation, especially as the global ideas moved across sites, involved reinvention while maintaining a core identity. Delineating a core identity for the innovation was typically done by the inventor who communicated that identity as the idea diffused. Sustained use of the innovation was dependent on the will of particular people or groups of people as well as availability of financial and other resources. The gathering and communication of evaluation data often helped make the case for sustainability but positive outcome data were not sufficient to ensure the long-term success of an innovation.

CONTEXT

In the Designing for Diffusion model, context can dominate the growth trajectory of a global idea. Context, almost by definition, is out of the control of interventionists. It's what you're given. Nor is context stable, which can be a positive, of course, when the status quo is not supportive of introducing and scaling up an innovation.

A supportive context makes it possible for an innovation to diffuse because potential adopters perceive that it's a good idea at the right time: A solution to a recognized and prioritized problem. An unsupportive or even an indifferent context does just the opposite; instead, the task of convincing potential adopters is much harder and success much less likely. When funding dries up, or a new administration comes into power, government policies change, or national media are focused on different social problems, a global idea can wither away, irrespective of its qualities or characteristics. In political science terms, an unfavorable context acts as a negative feedback loop in society so that a global idea that is highly promising in its set of attributes, once imported, never gets off the ground. So knowing the important features of context can facilitate spread of ideas.

If one framing of the innovation is going to face an uphill growth trajectory because of an unfavorable context, another framing of the innovation can be used to communicate its purpose and advantages to potential adopters.

This is the great advantage of a multisolving innovation: by definition, the innovation can be understood as contributing to multiple desirable change objectives. If one framing of the innovation is going to face an uphill growth trajectory because of an unfavorable context, another framing of the innovation can be used to communicate its purpose and advantages to potential adopters. If recent events and news and policy makers' attention is on patient safety, a quality improvement or health care cost-cutting innovation may be able to be reframed in terms of patient safety and thus recognized as a timely solution to an acknowledged problem. As context is dynamic, so too can be global ideas.

"Political will, funding and social desire, those are the pillars of a successful Open Streets program," said a researcher in Los Angeles. "Political will is the lynchpin, consistent funding being the second key, and social desire for it being another." Officials in several of the cities where we conducted interviews about Ciclovías noted that these favorable conditions loosened pocketbooks so that they could 'go out' and look for new initiatives.

When interviewees discussed the Swedish Patient Registry, they focused on the role of context as influential in the ways they chose pilot sites for the intervention with a particular focus on a culture of systems-level thinking as promoted by leaders within partner organizations. That is, political will on the part of the organizational leadership including the ability of leaders to look across the continuum of patient care and connect it with research needs and technological assets of the organization.

The built and natural environment was another contextual factor contributing to the adoption and sustenance of Ciclovías—good weather for being outdoors, conducive city spaces, and supportive infrastructure of biking/non-motorized transport. Opposition from business owners is a consistent early response to the idea of Open Streets. Strategies and data to counter-argue this anticipated reactance is a key topic of discussion during Ciclovía study tours. The litigious nature of U.S. society in the event of a Ciclovía being targeted for an attack or an accident occurring was also mentioned as a contextual factor that needed to be addressed when presenting the Open Streets idea to city officials.

The determining role of context was perhaps most obvious for ConsejoSano. First, the large and growing Spanish-speaking populations in the U.S. provided a ready and underserved market. Second, the low-performing but well-financed U.S. health care system created a need for the innovation. "As I was looking at that, I realized that there were a lot of changes happening in the U.S. health care market," said a ConsejoSano leader. "We were moving toward consumer-oriented health care where people were starting to make choices for themselves or their families. Obamacare [*sic* Affordable Care Act, A.C.A.] was about to be rolled out and for the first time, you know, there was going to be a huge expansion of people who were getting insurance and Hispanics are the most under-insured segment of the public in the U.S. at that time and it still is true. Along with that, I knew that there was huge growth in digital health and new technological and mobile solutions. You had all of these things coming together that said, 'there may be an opportunity to drive better outcomes for Spanish speakers in the U.S.!' So, I looked around to see if anybody was building new solutions and literally I did a survey and no one was. I was, like, this is one of the fastest growing demographics—it's a majority in California already in terms of ethnic groups. And Texas is a majority minority state with Hispanics leading that. No one was building any solutions for Spanish speakers."

"You had all of these things coming together that said, 'there may be an opportunity to drive better outcomes for Spanish speakers in the U.S.!"

One leader from AgeWell talked about the policy environment around health care as an enabling aspect of context. "It was a period when Obamacare [*sic* A.C.A] was coming into place. The notion was, in the value propositions, it would appeal to those interested in value-based and population-oriented care. Appreciating again, we are interested in keeping people out of hospitals, so to the extent, your fee for service or your hospital is interested in putting heads in beds, we are not your friend, but for health plans, we would be your friend across the board because presumably health plans are always interested in saving money. But we were hoping that in the era of A.C.A.s, [*sic*] we would be able to contribute to reducing health care costs. And our business model was reducing cost and providing those savings for health plans and hospital systems."

The timing for the introduction of a new idea was discussed as a critical contextual factor by a number of our interviewees. For example, one leader from AgeWell described the timing of implementation relative to other initiatives in the organization: "The disconnect that we did not identify fast enough was the strategic direction of our Community Health and Well-Being team and where they were going with the idea of spreading a community health worker model. And actually from the time that we started this challenge, which would have been in the summer in 2016, until Agewell ended in April of 2018, our Community Health and Well-Being senior vice-president left the company, and they did not have a senior leader for about four months and they brought in his replacement who went down a different strategic path for Community Health and Well-Being where the community health worker model was prioritized. I think Agewell would have been scaled

at Trinity if that would not had been the case, if we would not have already committed to our community model. And if it were Agewell coming in to a place where we had nothing, we would have been striving to scale that out, but since we had already picked the community health workers, we did not."

The Cardiff Violence Prevention Model diffused in places where, at the time of adoption, violence was a priority for the community given a context in which more violence seemed to be happening and was being covered by the mass media. So, the Cardiff Model became a solution to a newly important and prioritized problem, regardless of the size of the community. When asked about the relevance of the model in communities of different sizes, one leader said: "I have been surprised at how relevant the model is to smaller communities for example, not just the big cities. I had thought that it's much more relevant in big cities than it is in small towns, but we find that small towns with 30,000 to 50,000 people have an information flow from the emergency department about where people are getting assaulted, stabbed, or shot; it's just as important as in a big city."

Summary about context. The macro-policy context functioned in an enabling role in the cases we examined. The historical context and the timing of the introduction of global ideas played both a hindering and facilitating role for several of the cases. The nature of the organizational culture of involved organizations—in particular the priorities of leadership and the ability to look across systems—appears to be an important aspect of context. Finally, the existing funding structures and options for financial support for health innovations played a role in diffusion, implementation, and sustained use.

A smart environmental scan—building the business case—is exactly how one takes context into account for creating and then reinventing a global idea to best take advantage of a favorable context. This activity is a critical part of what a readiness assessment prior to the introduction of an innovation can do for an innovation partnership team.

Section 5.

Conclusion and Recommendations

Our purpose was to specify a conceptual model that might explain why global ideas in the form of health innovations do or do not scale up and achieve diffusion in the United States, and then gather feedback about that model by interviewing leaders and implementers involved in bringing five global ideas to the U.S. and trying to scale them up. We compared what they told us about their scale up experiences with what we had specified as components and sub-components in our conceptual model. Additionally, in the course of data-collection, it became clear to us that interviewees and the types of inter-organizational partnerships they represented could make good use of social science-based guidance about the diffusion of health innovations.

For the body of work reported here, we used published literature, particularly from the diffusion of innovations research and practice paradigm, to propose a conceptual model. Then, we initiated a protocol to identify candidate health innovations from countries outside of the U.S. in order to select a subset of them to learn how each of them had come to the U.S. and what had happened to them after their adoption in U.S. communities. We did this through the conduct of interviews with the social entrepreneurs and partnering organizational leaders as well as implementation managers who were well-positioned to explain these histories to us. The interviews were shaped by a semi-structured set of questions that directly reflected the components of the conceptual model; yet, the interview protocol was sufficiently open-ended to allow for the capture of factors that we had not included in our model. Trained coders read transcribed interviews and qualitatively coded for themes present in the texts. Themes were then grouped and cross-checked among coders.

In this way, we brought empirical data to bear on the conceptual model through a qualitative "goodness of fit" assessment. We wanted to know which of the components and sub-components seemed consistently important across the five global ideas, which were important to some but not all of the health innovations, and whether we were wrong in hypothesizing that all of these components and sub-components would contribute to the explanations by interviewees about each of the five innovations.

In other words, had we got it right?

The five innovations were:

- AgeWell Global, originating in South Africa. This program pairs able older residents with less able elders through one-on-one meetings and mobile technology to improve health outcomes and drive down medical costs
- Cardiff Violence Prevention Model, originating in Wales. This program provides communities a means to learn where, when and how violence occurs through a partnership with hospital emergency department staff and the police and then act to prevent further violence
- Ciclovía, originating in Colombia. This community-based recreation program temporarily closes down city streets to automobile traffic in order to combat social isolation while helping to integrate diverse communities through shared physical activity
- ConsejoSano, originating in Mexico. This private company contracts with health insurers in the U.S. to help clinics reach out in culturally appropriate ways to poor and disadvantaged community members so that they access health services

» Swedish Quality Registry, originating in Sweden. This electronic medical record system enables patients as well as health care providers to input information about patient progress for improved decision making and greater patient engagement in disease management

The five global ideas studied are not of one type of health innovation; rather, they are an internally divergent set, along the lines of what case study methodologists have labeled a "most different systems" design for comparative assessment (Przeworski & Teune, 1971). This we did knowingly. While multiple similar cases always are desirable for adding to confidence in conclusions, wide variance in cases can be even more enlightening when a study team analyzes data with the objective of identifying commonalities across divergent cases. If a component or factor is consistently important—or consistently unimportant—across quite different cases, the result can be considered a stronger test of those variables than if the cases share a number of commonalities, for example by holding constant geographic area, target audience, health condition or medium of communication (i.e., person-to-person, social media, etc.). Still, while we did interview a number of people and code many instances of themes, five is a modest number of cases. The results summarized here should be considered tentative, not conclusive, given this caveat.

CONSISTENCY ACROSS CASES

Across the cases we studied there is strong support for the importance of:

» attributes of global innovation ideas

» linking agents

» inter-organizational partnerships, and

» scaling strategies

Innovation attributes. To varying degrees, the characteristics or attributes of innovations are changeable. Complexity can be reduced by a partnership to accomplish objectives of making an innovation more affordable or reaching and benefitting more people (i.e., not allowing the pursuit of the perfect to be the enemy of the good). Innovations can be made more trialable to reduce risk to potential adopters. Whereas the city of Bogotá, Colombia hosts Ciclovía every weekend year-round and on many miles of streets, an interested U.S. city can commit to just one weekend day per year, covering only a few miles, in effect as a trial. This reduces risk. Ciclovía is very trialable. In this attribute, Ciclovía is very different from the other four innovations we studied.

No one attribute was discussed as being important for these five innovations we studied than compatibility. Interviewees talked again and again about how their innovation was a good fit for community objectives (Cardiff Model), health system priorities (AgeWell) or foundation goals (Swedish Quality Registry). ConsejoSano exemplified this reliance on the concept of compatibility, which in their case means compatibility with the cultures of the low-income Spanish speakers whom they seek to help. ConsejoSano staff are sensitive to local dialects, local resources and needs of their target populations.

Interviewees for each of the five innovations emphasized benefits and costs. This result is common in the more general diffusion of innovation literature, too. There was a sense among interviewees that while the importance of different characteristics would naturally differ given the varied forms and functions that innovations take, when those benefits/costs (i.e., pros & cons) are considered together, the qualitative calculation had to be, on balance, positive. This positive balance was achieved in different ways according to the innovation in question. What was essential was that when a potential adopter thought about an innovation, the positives had to outweigh the negatives.

We had anticipated that stigma would be a problem for these innovations, especially those from low- and middle-income countries. We did not find this to be the case. Indeed, some interviewees said that the fact that an innovation had come from a low-income country was "cool" and thus a positive for priority populations in their communities. We conclude that this sub-component should be reconceptualized as "origin", since our results suggest that innovation origin can be a positive, too.

Linking agents. Interviewees consistently emphasized the vital role of social entrepreneurs as visionaries and spokespersons who through force of personality were able to convince others of the promise of their global idea and create a shared understanding of both a societal problem and their solution to it. The social entrepreneurs we interviewed and learned about from others are not in the business of modesty in either problem identification or health innovation. Neither do they emphasize research, even when they are highly trained and established researchers. The problems they identify and publicize are societal problems, not academic ones. Their success is partly due to their persuasiveness, determination and persistence, and their social network role as boundary spanners. These leaders have far-reaching contacts that enable them to access social and, thus, economic capital to pursue their visions.

Funders, government officials and policy makers also consistently function as linking agents for the innovations we studied. They are the well-placed individuals that social entrepreneurs seek to meet and convince because they hold the keys to resources of several types. In a very real sense, funders, government officials and policy makers become extensions of social entrepreneurs. They function to amplify the message and alert others to both problem and solution as framed by the social entrepreneur. We heard multiple stories of funders, government officials and policy makers taking on the role of policy entrepreneur by representing the global idea to others who hold the promise of expanding the support (and thus sharing the investment risk) for a health innovation and its scale up to new sites.

Inter-organizational partnerships. The five cases we studied all were successful and grew internationally because of a set of facilitative organizations that work together on behalf of the global idea. While the social entrepreneur may found an organization that is dedicated to one health innovation in question (such as ConsejoSano), most of the organizations that partner to facilitate the spread of a global idea employ staff whom have many responsibilities, not just the innovation in question. The Medical College of Wisconsin, the Portland Bureau of Transportation, the Los Angeles Mayor's Office, RAND Corporation, and Trinity Health in Fort Lauderdale are partnering organizations with many responsibilities. Just a small proportion of their staff work on behalf of the global ideas we studied.

Still, the inter-organizational partnerships that formed to support each of the five innovations are the foundation for scale up and diffusion in the U.S. Each partnership represents the institutionalization of a social entrepreneur's vision for how that innovation may come to the U.S. and benefit U.S. society. These partnerships are fluid with new funders coming onboard, new waves of volunteers staffing local events, and cities demonstrating or trying a global idea as a pilot and sometimes ending their investment. The partnerships serve not just as the embodiment of the global idea and the basis for powering it forward but also as a host and point of contact for interested stakeholders from other U.S. communities that have heard about the innovation and want to see it in action or visit to ask questions about how it works and with what effects. We heard many comments along these lines. In other words, the global ideas that we studied, even as they all rely on a dissemination of information in the form of news stories, websites, YouTube, academic peer-reviewed journal articles, funding proposals and PowerPoint presentations, they are powered both nationally and locally through tangible inter-organizational partnerships. It is in the partnerships where decisions are made about scaling strategy.

Scaling strategies. Serving more people with comparable benefits from the sustained implementations of a successful innovation is the scale up objective. Different pathways can lead to scale and, indeed, we found evidence of multiple pathways being used by inter-organizational partnerships. All five cases showed the importance of dissemination to the communication of global ideas. The Cardiff Violence Prevention Model first "made it" to the U.S. because of a staff member at the U.S. CDC reading about it in a journal article. Word-of-mouth in cycling clubs and international bicycling associations transmitted information about Ciclovía from country to country, including in the U.S. The dissemination of information about global ideas is one path to scale up and we heard about it in relation to every case. Yet we also heard that just as dissemination of information usually functions to alert or inform potential adopters of descriptive knowledge about an innovation, so too here did dissemination lead to searches for how-to knowledge—tacit knowledge—that is better communicated through personal visits, site demonstrations and study tours so that potential adopters can observe, ask questions and hear how organizational and community-level barriers were overcome.

The partnerships themselves sought to grow via business models that are well understood in the business literature. AgeWell and the Cardiff Model essentially followed a strategy of scaling by finding and training affiliates in each new U.S. community. The Swedish Quality Registry and ConsejoSano found distribution network organizations that already had ready access to health care providers and patient populations. Ciclovía did something different. Whereas each of the other four health innovations relied on dissemination of information in addition to growing by affiliates or by partnering with a network organization, Ciclovía exclusively relied on dissemination as a means of scaling up. No contracts, no licensing of technology, no cost-sharing, no required trainings and no fidelity checks. That Ciclovía requires the least of adopting communities and has scaled up the most of the five innovations studied is probably not coincidence.

None of the partnerships we studied tried to scale up by establishing formal branches of the partnership in each new community.

Scaling strategies can include reinventions by originators and their inter-organizational partnership teams to reposition an innovation in light of lessons learned, as well as decisions related to the degree of freedom allowed to implementers to adapt an innovation once it is adopted into an organization or community. The Cardiff Model has gone through little reinvention and only modest adaptation in the field. ConsejoSano is on the other end of the spectrum, having been reinvented to a very considerable degree by organizational leaders once they realized that a first service would not qualify for reimbursement in the U.S. health care system. Ciclovía has not been reinvented but localities do what with it they like: In some cities it is a cycling event; in others, more of a carnival; Portland, Oregon has fashioned its Portland Sunday Parkways as an immigrant and social inclusion event. Wayne County, near Detroit, closes the same relatively rural six miles of roadway for its Ciclovía once a week in summer and fall. Los Angeles turns out hundreds of thousands of people four times a year to a different CicLAvia route each time. The Dartmouth team has a consistent model for the Swedish Quality Registry that is customized in collaboration with each disease-specific foundation with which they partner. AgeWell staff were willing to make considerable accommodations at its U.S. demonstration sites.

STRATEGIES NOT DISCUSSED BY INTERVIEWEES

External validity. If a health innovation works well in not just one prior site but in many prior sites, it stands to reason that a potential adopter may feel more confident (that is, less risk) in deciding to adopt and try an innovation. While a leader of AgeWell did take explicit action to spread that innovation to Europe before the U.S. in order to make adoption in the U.S. more likely, we found little evidence that interviewees emphasized external validity as a selling point of health innovations.

Choice of innovations. Potential adopters are more likely to make a decision to adopt an innovation when they are presented with a delimited set of innovations from which to choose; i.e., a "menu of options." Having a choice of innovations enables a potential adopter a chance to find one that is reasonably well-suited to their specific circumstance in terms of organizational capacity, resources, community norms, and intended beneficiaries. While some interviewees did comment on adaptability as a positive in relation to adoption, none discussed their innovation as being jointly offered with other innovations.

Implementation alternatives. When they consider an innovation, potential adopters frequently foresee challenges to effective implementation. This is a part of the mental calculus involved in the adoption decision-process. Being given alternative ways of implementing each core component of an innovation helps potential adopters understand how an innovation can be creatively adapted while still achieving its objectives. No interviewees commented on either the provision or receipt of alternative ways of implementing an innovation.

Correlational functions in society. Sometimes, organized activities around scale up and dissemination can achieve change objectives because of a complex mutually-reinforcing interplay of contextual factors, even when those factors are not the result of centralized direction. The change "just seems" to occur. Mass media are key to this cumulative effect, providing what Harold D. Lasswell (1948) referred to as *a correlational function* of society, in helping to focus attention on particular problems as public issues. Being sensitive to such contextual, cultural or normative shifts is an art that can be bolstered with media and legislative monitoring technology so that advocates know when to introduce an innovation that can be rapidly perceived as a solution to an acknowledged problem. We found no evidence of interviewees referring to such monitoring for strategic purposes.

Societal timing. Related to the idea of a changing context is the notion that inventors, partners and supportive intermediaries can delay introduction of an innovation until "the time is right." Public relations professionals understand news cycles, and observe newsroom practices such as running a story when there is not a competing story that will overshadow or draw too much attention away from a given event or issue. The political science tradition of policy diffusion shows an unambiguous clustering of policy adoptions over time, meaning that adopters are responding not just to each innovation but to exogenous variables in the environment as well. We found no evidence of interviewees trying to use time to their advantage when discussing their experience with our five innovations of study.

Framing of innovations. Framing refers to the meaning that an inventor or partnership seeks to associate with an innovation. It may involve highlighting particular attributes of an innovation while minimizing others. Or, the purpose of an innovation can be changed. For example, the Swedish Quality Registry may be framed as a solution to patient engagement, or as a solution to building better data systems for scientific understanding and disease treatment (and indeed it is framed in both of these ways). AgeWell may be framed as a solution to social isolation, or high hospital readmission rates. Like the generalized innovation attributes of effectiveness, cost, compatibility, complexity etc., frames of meaning can be dynamic. One frame can be tried by a partnership to assess stakeholder response to it and if the response is less than enthusiastic, changed to another frame. A changing of frames can be very strategic on the part of a partnership in appealing to government officials, media reporters and funding officials. Our research shows that a number of the interviewees were strategic in their framing of the attributes of the innovation based on their understanding of the market or contextual conditions. Whereas changes in attributes sometimes implies real change to an innovation—for example by dropping a social media app that had been a part of an innovation—change from one frame to another does not. Communication materials and media will be affected, but not necessarily the innovation itself. Frames are communicated by words and images, and partnership teams can struggle with the "right language" for communicating about their innovation. The Swedish Quality Registry team at Dartmouth has been very successful in generating interest in their innovation despite difficult terminology.

RESEARCH RECOMMENDATIONS ABOUT RESPECIFICATION OF THE MODEL

1. The Designing for Diffusion model components should be retained, but several of these components need further development. *Context*, and in particular, the *framing* of innovations by both supportive organizational partnerships and by potential adopting organizations and communities, merits additional empirical scrutiny so that inventers and proponents better understand how to identify and associate positive meanings to their innovations.

2. Specification of the *core components* that are responsible for the positive effects of health innovations and a logical understanding of how those components relate to implementation fidelity is of special import. Questions about the activities of innovation designers and their proponents in relation to reinvention, as well as the actions of adopters and implementers in relation to adaptation, require clarification so that all stakeholders better understand what they should and should not do in modifying health innovations.

3. The D4D model sub-component of *stigma* should be reconceptualized as *origin*. Stigma refers to a negative association, but our results suggest that health innovations from middle- and low-income countries or low-income communities in high-income countries can have positive associations concerning origin in the minds of U.S. stakeholders.

4. Important sub-components of the D4D model that we proposed and tested were not emphasized by interviewees. These included external validity, providing potential adopters with a choice of innovations, providing implementers with alternatives for implementation, and the timing and framing of innovations. That is, interviewees, when given the chance, did not suggest the importance of these sub-components to scaling up health innovations. This result can be interpreted in one or more ways; i.e., (a) contrary to the literature these sub-components really are unimportant to diffusion, (b) the data-collection method was insufficient to draw out this information from interviewees, or (c) these factors are important to diffusion but *our interviewees did not know to consider them* when making decisions about scale up. We believe the best answer to be the latter one. This leads us to recommendations about the need for guidance for practitioners.

PRACTICE RECOMMENDATIONS ABOUT THE DEVELOPMENT OF GUIDANCE

5. There was a shared sense among interviewees that they were operating *on the basis of trial and error*, without the benefit of systematic information about scale up and diffusion choices, trade-offs, and likely barriers. This suggests the need for guidance, either in the form of opportunities for meeting and discussion, or training and technical assistance, for inventors and their partners. More formal supports could of course by piloted and developed as an advice-sharing system or collaborative learning network for health innovation inventors and their partners.

6. Sustainable guidance for inventors, partners and supportive intermediaries could be developed in various formats. Minimum investment options such as webinars, tear sheets and practitioner publications may be sufficient and preferred by some stakeholders. Another option is prototyping and formative testing of an interactive decision tool to augment the information that inventors, partners and supportive intermediaries have as they face resource decisions about scale up and diffusion of global ideas. Advances in communication technology have made such tools increasingly user-friendly and easier for practitioners to assume and maintain.

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Appendix A

Global Innovations Considered for Study

Innovation	Country of Origin	Description	Website
3Nethra	India	3Nethra is a portable, non-invasive, non-mydriatic, pre-screening ophthalmology device.	http://www.forushealth.com/3nethra-classic.html
Access Mobile International	Uganda	Access mobile, Inc provides mobile solutions for business and social needs of private businesses, government agencies.	http://www.accessmobile.io
Aflatoun	Netherlands	Aflatoun is an NGO offering social and financial education to children and young people worldwide	https://www.aflatoun.org
AgeWell	South Africa	AgeWell Global is a new model of elder care coordination combining peer-based social engagement and mobile technology to improve health outcomes and drive down medical costs.	https://www.agewellglobal.com
APOPO	Mozambique	APOPO's scent detection rats detect landmines and tuberculosis.	https://www.apopo.org/en
Aravind Eye Care Model	India	Aravind Eye Hospitals is a hospital chain in India. It has grown into a network of eye hospitals and has had a major impact in eradicating cataract related blindness in India.	http://www.aravind.org
BasicNeeds	Kenya	A community-based health support program focusing on mental illness and epilepsy in poorest communities.	http://www.basicneeds.org
Big White Wall (BWW)	U.K.	Helps with a wide range of mental health and wellbeing issues with one-on-one online therapy – from anxiety, depression, stress and trauma, to relationship problems and lifestyle challenges	https://www.bigwhitewall.com
Buurtzorg Model	U.K.	The Dutch home-care provider Buurtzorg Nederland has attracted widespread interest for its innovative use of self-governing nurse teams. Rather than relying on different types of personnel to provide individual services, Buurtzorg expects its nurses to deliver the full range of medical and support services to clients.	http://www.commonwealthfund.org/publications/case-studies/2015/may/home-care-nursing-teams-netherlands

Innovation	Country of Origin	Description	Website
Call & Check Visit Program	U.K.	A service where postal service workers check on isolated, frail elderly residents in the community. During a five-minute visit, postal workers deliver prescription refills, remind clients of upcoming medical visits, and ask about their health and social needs.	http://www.ihi.org/resources/Pages/Publications/Call-and-Check-Visits-Frail-Elderly-Innovation-Case-Study.aspx
Cardiff Violence Prevention Model	U.K.	The Cardiff Violence Prevention Model (Cardiff Model) provides a way for communities to gain more complete information as to where violence occurs and how to prevent it by forming partnerships between hospitals and law enforcement and others interested in violence prevention	https://www.rwjf.org/en/blog/2018/06/successful-model-that-predicts-and-prevents-violence.html
Ciclovía	Colombia	A free community-based and recreational program in which certain streets are closed temporarily to automobiles for cyclists, roller-blades and pedestrians.	https://en.wikipedia.org/wiki/Ciclov%C3%ADa https://www.idrd.gov.co/Ciclovía-bogotana
Ciudad Saluadable (Healthy City)	Peru	A non-profit organization founded in 2002 that seeks to build healthy, inclusive cities where everyone can live in harmony, with justice and equality of opportunity.	http://skoll.org/organization/ciudad-saludable/ https://www.ciudadsaludable.org
Community Aging in Place Advancing Better Living for Elders (CAPABLE)	U.S.	A low-cost program created by John Hopkins Medicine that integrates a registered nurse an occupational therapist and a licensed handyman who work with individual seniors—particularly low-income urban men and women of color—to keep them at home, functional and safe.	https://vnacolorado.org/capable/ https://nursing.jhu.edu/faculty_research/research/projects/capable/
ConsejoSano	Mexico	ConsejoSano provides patient engagement software and healthcare data analytics tailored to help providers & payers increase engagement with multicultural needs.	http://consejosano.com
Cuba's Health Record	Cuba	The Cuban government operates a national health system and assumes fiscal and administrative responsibility for the health care of all its citizens. There are no private hospitals or clinics as all health services are government-run.	https://www.ncbi.nlm.nih.gov/pubmed/2567849
DaVita In-center Dialysis	Sweden	Self-management program for patients undergoing dialysis. This change in approach was driven by a single patient seeking to take charge of his own care and improve his quality of life.	http://www.hpoe.org/resources/case-studies/1299

Innovation	Country of Origin	Description	Website
eRanger Motorbike Ambulance	U.K.	The eRanger is a versatile and robust vehicle design to enable access over the toughest terrain to deliver its varied cargo safely and in one piece, ready to go into action quickly and easily.	http://www.eranger.com/The-eRanger-Bikes/Ambulance.aspx
Esther Model of Elderly Care	Sweden	Improving care for elderly patients with complex needs.	
Forest Bathing	Japan	Being in the presence of trees—became part of a national public health program in Japan in 1982 when the forestry ministry coined the phrase "shinrin-yoku" and promoted topiary as therapy.	http://www.shinrin-yoku.org/shinrin-yoku.html
Girls Not Brides	Bangladesh	A global partnership of more than 1000 civil society organizations committed to ending child marriage and enabling girls to fulfil their potential.	https://www.girlsnotbrides.org
iKure Techsoft	India	An award-winning, tech-savvy, rapidly-growing, revenue-positive social enterprise that meets the primary health care and prevention needs through a unique combination of health outreach initiative, skills development, and technology intervention.	http://www.ikuretechsoft.com
Māori practices for historical trauma	New Zealand	Demonstrates how these methods are being widely used to facilitate healing and discusses how their application across health services will enhance Māori well-being.	http://www.journal.mai.ac.nz/content/historical-trauma-healing-and-well-being-māori-communities
Medicallhome (Mexico)	Mexico	MedicallHome leverages the existing network and billing platform of the leading telecommunications company in Mexico, TelMex, as part of a joint venture to provide customers with 24/7 access to medical advice over the phone, eliminating unnecessary travel and payment for clinic visits.	https://medicallhome.mx
MedicallyHome	U.S.	Intensive home health care services as an alternative to hospitalization are becoming a standard option in many health systems around the world.	www.MedicallyHome.com
Microclinic International	Palestine	Microclinic Social Network Model leverages human relationships to address both non-infectious and infectious disease epidemics such as diabetes and HIV/AIDS.	http://microclinics.org
Namati	Sierra Leone	Building a global movement of grassroots legal advocates who help put the power of law in the hands of people.	www.namati.org

Innovation	Country of Origin	Description	Website
Naryana Health	India	Narayana Health is headquartered in Bengaluru, India, and operates a network of hospitals across the country.	https://www.narayanahealth.org
Nepal's Female Community Health Volunteer Program	Nepal	The Female Community Health Volunteer (FCHV) Program in Nepal was started in 1988 by the Ministry of Health and Population to improve community participation and enhance the outreach of health services through local women working voluntarily.	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5519587/
Noora Health	India	Noora Health's mission is to train patients and their families with high-impact health skills to improve outcomes and save lives. They also turn hospital hallways and waiting rooms into classrooms and enable family members to provide care in the hospital and at home.	http://www.noorahealth.org
Preventing crime with mental health professionals	Netherlands	Policy collaboration with mental healthcare and criminal justice system. Broadly referred to as "jail diversion" strategies, they include mental health courts, specialty probation and parole, pretrial diversion programs, and conditional release programs.	
Slum Dwellers International	South Africa	Slum Dwellers International (SDI) is a global social movement of the urban poor started in 1996. SDI claims that it makes partnerships between communities, partnerships with Government and with other stakeholders.	http://www.sdinet.org
Sproxil	Nigeria	For-profit company based in Cambridge, Massachusetts that provides a consumer product verification service (called Mobile Authentication Service or MAS) to help consumers avoid purchasing counterfeit products	https://www.sproxil.com
Swedish Rheumatology Quality Registry	Sweden	A national registery, the purpose of which is to continually improve the treatment and follow-up of patients with rheumatic diseases through the co-creation of care between patients and providers.	http://srq.nu/en/
The Afghan Institute of Learning	Afghanistan	The Afghan Institute of Learning (AIL) builds education and health systems in Afghanistan using a holistic approach. AIL combines innovative education, quality health care with health education and training programs as well as providing emergency aid and legal aid.	https://www.afghaninstituteoflearning.org
Together for Mental Wellbeing	U.K.	A national mental health charity working alongside people with mental health issues on their journey towards independent and fulfilling lives.	https://www.together-uk.org

Innovation	Country of Origin	Description	Website
Unimed	Brazil	Unimed is a Brazilian medical work cooperative and health insurance operator.	https://en.wikipedia.org/wiki/Unimed_(organization) https://www.unimed.coop.br
Universal Basic Income Program	U.K.	A basic income, also called basic income guarantee, universal basic income (UBI), basic living stipend (BLS), or universal demogrant, is a type of program in which citizens (or permanent residents) of a country may receive a regular sum of money from a source such as the government.	https://en.wikipedia.org/wiki/Basic_income_in_the_United_Kingdom https://www.basicincome.org.uk
Upstream Health Innovations	U.S.	Seeks to empower patients to lead healthy lives, partners with the community to build capacity and fosters the health innovations that create equity and improve outcomes.	https://upstreaminnovations.org

Appendix B

Case Descriptions for the Five Innovations of Study

INNOVATION 1: AGEWELL (FROM SOUTH AFRICA)

AgeWell is a model of care coordination that combines peer-based social engagement and mobile technology to improve health outcomes and drive down medical costs for elders. AgeWell recruits able older people (known as AgeWells) who are compensated for providing companionship and monitoring the health of other elders in their communities. These AgeWells identify potential health issues early, which helps keep elders in their homes and generates significant cost savings to the medical system.

AgeWell was founded in Cape Town, South Africa in 2013 as an offshoot of Mother2Mother, a successful peer-to-peer model of education and support for women and mothers living with HIV. In partnership with community-based organizations, AgeWell launched its first pilot and achieved a 50% increase in well-being scores amongst elders within the first month of service and a 95% reduction in signs of depression.

Why AgeWell is Important

AgeWell leaders recognized the challenges that come with the world's aging population. It is expected that 22% of the world's population will be 60 or older by 2050. With less than 3% of medical students choosing geriatrics, a three-fold decline in the number of traditional caregivers is also expected. Additionally, health care costs for older adults are rising. In the United States, adults over 65 account for the highest health care spending of all age groups, with nearly 50% of an individual's lifetime health care expenses spent after 65.

How AgeWell Works

AgeWells are connected to elders through two programs: the hospital discharge program, and the community-based program.

In the hospital discharge program, patients are connected with an AgeWell as they approach the end of their hospital stay. The AgeWell's subsequent check-ins with their client are intended to facilitate follow-up appointments and to decrease chances of readmission.

The community-based program is intended to stop preventable health problems in older community members who struggle to engage in consistent medical care. AgeWells of the same demographic and neighborhood as the elder are often able to engage more effectively with these community members than a health professional.

The AgeWells use a mobile app to assess 20 observations and 20 questions during each visit, such as, "Is there enough food?" and "Have you had any falls?" The app's algorithm then uses these data points to suggest appropriate referrals for the AgeWell's client when necessary.

Diffusion of AgeWell to the U.S.

A report on the positive outcome of AgeWell by the World Health Organization's Innovation Center for Aging led to recognition and additional partnerships. Subsequently, AgeWell diffused to the United Kingdom and the U.S. AgeWell launched its first U.S. pilot in 2016 in partnership with Henry Street Settlement, a social service organization in New York City. In 2017, AgeWell partnered with Trinity Health and Fairhill Partners to launch hospital discharge programs in Holy Cross Hospital (Florida) and Metro Health Hospital (Ohio). Another pilot program at the Jewish Healthcare Foundation in Pittsburgh was started but discontinued.

INNOVATION 2: CONSEJOSANO (FROM MEXICO)

ConsejoSano, whose name means HealthyAdvice in Spanish, is a small private company that contracts with health insurers and community clinics in the U.S. to help them remove barriers that stop poor and disadvantaged community members from obtaining health services. ConsejoSano offers the only healthcare engagement solution tailored the needs of multi-cultural populations. With a multidisciplinary team of doctors, medical providers, engineers, health policy experts, and engagement specialists from across the globe, ConsejoSano combines data, behavioral science, and a deep understanding of culture to create savings for health providers and deliver better care to their patients.

ConsejoSano is a model of patient engagement and care navigation, working with insurers, employers and at-risk providers to increase engagement from their Spanish speaking customers, patients and employees.

ConsejoSano originated from MedicalHome, a telehealth model of Salud Interactiva, a successful Mexico-based company that provides telephone access to licensed doctors 24/7, with discounted prices to low and middle-income households in Mexico. MedicalHome was developed to complement medical insurance and to counter the inability of Mexico's public healthcare delivery sector to meet the demand of its population.

Why ConsejoSano is Important

The healthcare system in the United States is complex, and patients from all cultural backgrounds often find it difficult to navigate. This complexity is compounded by additional language and cultural barriers for some demographics in the U.S. Subsequently, a large number of people wait too long before seeking medical care, then soliciting care at a later point, when care is less effective and more expensive than it would have been earlier.

Hispanic people, who already make up a fifth of the U.S. population and who are expected to reach 30% of the population by 2050, are one of the most underinsured demographics in the country. The Affordable Care Act (ACA) increased health care coverage in Hispanic communities, but language barriers and a lack of information continue to keep Hispanic health care coverage at a lower rate than most other U.S. groups.

The language and cultural barriers facing many Hispanic Americans are also a problem for millions of others; ConsejoSano aims to help populations beyond Hispanic Americans with its services.

How ConsejoSano Works

ConsejoSano predominantly works with clinics and insurers to proactively engage with patients. Using a culturally tailored approach in the patient's native language, they answer questions about appropriate health care and help patients navigate efficiently to in-network services. ConsejoSano has a social impact model which integrates campaigns and outreach, patient engagement through multichannel communications, and healthcare data analytics in analyzing the patient's psychographic profile in order to facilitate behavior change.

Diffusion of ConsejoSano to the U.S.

In February 2017, ConsejoSano began their first contract with an independent practice association that cares for over 300,000 Medicaid members in part of southern California. They worked directly with the network of clinics to get access to the patients in order to help them navigate the system and get care. Since then, they have been able to expand throughout Southern California, and into Texas, New Mexico, and Illinois.

INNOVATION 3: CICLOVÍA (FROM COLOMBIA)

Ciclovía is a free, community-based recreational open streets initiative in which select streets are temporarily closed to automobiles. These car-free streets become open spaces for citizens to safely bicycle, jog, stroll, play, and mingle, which encourages healthy recreation and social interaction. Open streets events like Ciclovía are intended to promote physical activity, prevent chronic disease and improve community members' quality of life.

The Ciclovía (which means "bikeway" in Spanish) program originated in Bogotá, Colombia, in 1974 and continues to present day. In Bogotá, over 70 miles of roads close to motor vehicles every Sunday, and up to a quarter of the city's population engages in healthy recreation and social interaction in the Ciclovía. Since its inception, the Ciclovía concept has spread in hundreds of cities globally, including many cities in the United States.

Why Ciclovía is Important

Fewer than 10% of U.S. adults meet physical activity guidelines set by the U.S. Department of Health and Human Services. Open streets events like Ciclovía aim to encourage physical activity, improve air quality, promote community building, and provide more equitable use of streets. These events encourage walking and bicycling, in turn developing a demand for a more pedestrian- and bicycle-friendly infrastructure.

How Ciclovía Works

The implementation of open streets events like Ciclovía depend on support from policy makers, community groups, and local businesses. Policy makers assist with public endorsement, funding, permits, and coordination with security efforts. Local businesses have a stake in how community members are physically able to access their locations, and are incentivized to support open streets events due to increased exposure and sales. Community groups help provide effective communication between stakeholders during the planning and implementation process.

Diffusion of Ciclovía to the U.S.

In 2005, the Centers for Disease Control (CDC) and World Health Organization Collaborating Center helped found the Ciclovías Network of the Americas (which is now named the Open Streets Initiative) as a means of reducing chronic diseases associated with increasingly sedentary lifestyles. The first open streets event in the U.S. was 2008's "Sunday Parkways" in Portland, Oregon, followed soon after by Los Angeles' CicLAvía in 2010. As these events gained popularity, more cities began implementing Ciclovía-style events. New York City named their version "Summer Streets," Atlanta, Georgia calls theirs "Streets Alive," and in Brownsville, Texas, city officials named theirs "CicloBia."

INNOVATION 4:
CARDIFF VIOLENCE PREVENTION MODEL (FROM THE UNITED KINGDOM)

The Cardiff Violence Prevention Model utilizes data sharing partnerships between communities, hospitals and law enforcement to allocate violence prevention resources more effectively. Local hospitals take basic, anonymized information from every assault victim admitted to their emergency room, including the location, weapon and time of the violent act. The hospitals share this data with local law enforcement officials, who combine the information with their own data to create maps of local violence hotspots. Enhanced knowledge of the location and timing of violence in communities allows for targeted law enforcement efforts and community-based interventions that can reduce future crime in those areas.

In the late 1990s, surgeon and Cardiff University professor Dr. Jonathan Shepherd discovered that only a quarter of the violent crimes that brought victims to the emergency room were reported to the police. Realizing that the hospital could be a vital data source for law enforcement, Dr. Shepherd collaborated with police and municipal leaders to create the Cardiff Violence Prevention Model in 1996. The model has been credited with a 41% reduction of hospital admissions in Cardiff, and around $6.6 million in annual savings for the city.

Why the Cardiff Violence Prevention Model is Important

According to the U.S. Department of Justice, over half of all violent crimes in the U.S. go unreported to the law enforcement. The Cardiff Model, through its anonymized hospital data reporting, provides a more complete database of violence and injury information than would be inaccessible to law enforcement alone. It provides a model for stakeholders to work collaboratively on the goal of reducing violence.

How the Cardiff Violence Prevention Model works

The Cardiff Model has two main phases: data collection and implementation.

- Data collection: Hospital emergency rooms collect data from patients who visit the ER as a result of a violent crime. This data includes where, when, and how the violence occurred. The data is then stripped of all personal identifiers by the Information Technology (IT) department in the hospitals and shared with the law enforcement. An analyst then combines the hospital data with law enforcement data to create maps of local hotspots where violence occurs.
- Implementation: Using the violence hotspot maps, violence prevention measures are implemented accordingly. The police heighten law enforcement efforts in hotspot areas and allocate resources toward environmental improvements that could reduce future violence in those areas.

Diffusion of the Cardiff Violence Prevention Model to the U.S.

Evaluations of the Cardiff Model's success generated interest in replicating the program. In the U.K., the model spread quickly; in 2016, it became legally mandatory for U.K. emergency rooms to collect violent crime data. Pilot versions of the Cardiff Model also diffused to cities in the Netherlands, Australia, and the U.S.

Partnering with the Centers for Disease Control and the Robert Wood Johnson Foundation, the first successful U.S. pilot of the Cardiff Violence Prevention Model was launched in the Atlanta, Georgia area in 2015. Named the United States Injury Prevention Partnership, the Dekalb County Police Department and Grady Memorial Hospital implemented the Cardiff Model of collecting anonymized data from trauma patients. Other pilots have been implemented in Milwaukee and Philadelphia.

INNOVATION 5: SWEDISH QUALITY REGISTRY (FROM SWEDEN)

Originally called the Swedish Rheumatology Quality Registry in Sweden, the Swedish Quality Registry is a generalized reinvention of the Swedish model, led by researchers at The Dartmouth Institute for Health Policy and Clinical Practice.

The collaborative registry is intended to improve health outcomes through patient engagement while serving as a database for research. The Swedish Quality Registry is different from other patient registries because it gives patients the ability to input and access their own data.

In 1995, the Swedish Rheumatology Society started the registry to improve health care for patients with rheumatoid arthritis. Over time, they expanded the registry to cover several other rheumatic diseases including ankylosing spondylitis, psoriatic arthritis, myositis, systemic lupus erythematosus, and additional conditions. Currently, the registry covers over 100 rheumatic diagnoses and has 89,000 patients.

Why the Swedish Quality Registry is Important

The complexities of delivering personalized care, low health outcomes and known issues in the health care sector while achieving patient engagement in their own health make data systems like this one critical.

Originally a research tool, the Swedish Quality Registry is now explicitly based in patient-centered principles of the coproduction of health.

Registries specific to patients with a particular health condition such as inflammatory bowel disease provide valuable information and support to patients as well as have the potential to contribute to the shared improvement of care and disease management through research.

Personalized care can improve health outcomes and patient satisfaction, and the registry model provides a platform for highly personalized patient-provider interaction. The provider and patient can work together as equal partners through a care cycle of co-assessing, co-deciding, co-planning and co-treating of health conditions via the registry. Registries are among the most important datasets used for longitudinal observational studies in cases of chronic diseases. The addition of input from patients allows a more detailed and comprehensive data set for research than a traditional patient registry.

How the Swedish Quality Registry Works

The innovation has four major components:

- A registery in which clinicians add examination and laboratory data, and in which patients can check their test results and report their symptoms on a frequent basis. The data from both parties is synthesized and graphically displayed to provide a snapshot of the patient's health status and a longitudinal image showing their personal health and treatment over time.
- The use of the combined patient and provider data to enable discussion, joint decision-making about the patient's care, and the subsequent tracking of outcomes by the patient, the patient's family and clinicians.
- A collaborative network of clinicians and care teams working together to improve patient population health.
- A facilitated network of patients who share information and support for each other.

Diffusion of the Swedish Quality Registry to the U.S.

In the U.S., the Swedish Quality Registry has been adapted in collaboration with national disease-specific foundations for patients with rheumatoid arthritis, cystic fibrosis, inflammatory bowel disease, and patients in palliative care.

Appendix C

Telephone Interview Protocol

Interviewee's Name: **Date:**

Organization: **Interviewers:**

Thanks again for agreeing to talk with us today about _____.

[Introduce ourselves]

The information that we are collecting is being done with funding from the Robert Wood Johnson Foundation. Our team involves researchers at Michigan State University, the University of Hawaii and Arizona State University. Our meeting will last roughly 1 hour or a little longer.

Do you have any questions for me before we begin?

PERSONAL INFORMATION

First of all, can you tell us about your own background and current professional responsibilities?

QUESTIONS ABOUT RESILIENT INNOVATIONS

1. Let's begin by telling me the story of _____. How did this all come about?
   a. Where did this begin?
   b. Why did _____ take the form that it did?
   c. Can you tell us more about the international origins of _____? How did it move to the US?
   d. Were there some stops & starts along the way? Can you tell us about those?
2. When you describe _____ to people, what do you say? What, for example, are its pros & cons? What are the positive aspects to _____? What are the challenges that people encounter when trying to understand and implement it?
3. Do you find that the origin of _____ is sometimes perceived as a negative by others who may want to adopt the model? Who has responded most negatively, and why?
4. Did you have any professional training in (the program) area, or did you learn on the way?

QUESTIONS ABOUT LINKING AGENTS

5. I want to ask you about how people learn about _____. Not so much those community members or patients or clients who can benefit from the program or the service personnel who deliver the program to them, but rather those leaders—elected officials, health system decision makers, nonprofit CEOs, maybe researchers or social activists or media personnel, and others—who may want to try this model in their own community. How do they tend to learn about it?
   a. In the case of _____, have there been special individuals—perhaps including yourself—who are particularly effective at spreading the word about _____?
   b. Has _____ spread from community to community, and if so, how did that happen?
   c. How do individuals like this convince others to take _____ seriously as something that works that they might want to try?

QUESTIONS ABOUT PARTNERSHIPS

6. Now let's discuss organizational partnerships and what kind of a collaboration it takes to bring an innovation like _____ to a new country to benefit a new population. What international or national organizations are behind _____? Have you worked together directly with them? And then, what about organizations locally that you work together with? By working together, I mean the ways that you got work done, in terms of leadership, management, communication, and the coordination of resources.

Probe if necessary: Do you have partnerships at different levels? For example, nationally and locally? If so, how does communication and coordination occur between those levels?

7. Okay, thanks. Now tell me how the partnerships work.
   a. What are the roles of the partners? What is each organization responsible for?
   b. Which organizations have played lead roles in this partnership? Was there any particular person/organization that played a connecting role?
   c. How important is the partnership for spreading _____?
   d. Have you been directly contacted by people interested in replicating the _____model?

QUESTIONS ABOUT SCALE UP STRATEGIES

8. How did _____ try to grow or spread to new communities? Or, how would you describe the scale up strategy of _____? What are the reasons for your approach to growing?

9. How well has this strategy worked so far for scaling up _____? Has this strategy been combined with other strategies? Have you moved on from one strategy to another? If so, why?

QUESTIONS ABOUT ADOPTING COMMUNITIES

10. As _____ has moved from community to community, has the innovation changed? For example, have later-generation implementers targeted different types of people as beneficiaries? Or maybe partnered with community organizations that you hadn't originally tried to partner with?

11. Sometimes innovations like _____ are changed to better suit a new community. Has this happened with _____? How so?

Why were changes made?

This is great, thank you.

12. What do you see as the big challenges for keeping _____ running? Funding, staffing? Training? Are there things that you or your team do to keep _____ operating correctly?

13. Do you collect process or outcome data about _____? Do you monitor things? I am really interested in what you pay attention to. Could you tell me about it?

Probe if necessary: Process data can involve, for example, the number of adopters. Outcome data can include, for example, the number of patients who suffer from a disease.

Are there new reports or slide decks that you can send me about results?

QUESTIONS ABOUT ENVIRONMENT

Okay, we're getting close to being done!

14. Let's turn to things that you can't control but that may affect how well _____ rolls out or is done in communities. Are there social, environmental, or political factors outside of your team and partnerships that affect what you are able to do and how quickly you can scale up _____?

Probe if necessary about budgetary allocations, framing of the issue and solution, timing, policies, and aspects of the community into which the innovation moved.

15. Looking back, what was the greatest challenge in your effort for the success of _____? How did this influence the work of _____? Would you do things differently now? How so?

That is all the questions that I have for now, but do you have any other comments about the scale up of _____ _____ that you would like to add?

I want to thank you again very much.

Would you being willing to review a draft of our report where we describe your program to ensure it's accurate?

Also, would you like a copy of the report that we produce for RWJF?

Lastly, I wanted to ask you about the possibility of a site visit, so that we could see what _____ is like in person. Is there one or more implementation site that we could visit and arrange to talk with those in charge? Who would be the best person to talk with?

Names, titles, city, email

Thanks again!

Appendix D

Interviewees

Interviewees	Organization	Innovation
1. David Simor	8 80 Cities	Ciclovía
2. Gil Peñalosa	8 80 Cities	Ciclovía
3. Alicia Bradford	Wayne County Parks Division	Ciclovía
4. Kim Healy	Wayne County Parks Division	Ciclovía
5. Steven Winkelman	Wayne County Parks Division	Ciclovía
6. Charles Brown	Rutgers University	Ciclovía
7. Romel Pascual	CicLAvia	Ciclovía
8. Shawn Dhanak	CicLAvia	Ciclovía
9. Deborah Cohen	Rand Corporation	Ciclovía
10. Christina Batteate	University of California Los Angeles	Ciclovía
11. Ian Stude	Portland Bureau of Transportation	Ciclovía
12. Rich Cassidy	Portland Bureau of Transportation	Ciclovía
13. Greg Raisman	Portland Bureau of Transportation	Ciclovía
14. Alexis Gabriel	Portland Bureau of Transportation	Ciclovía
15. Molly Haynes	Kaiser Permanente	Ciclovía
16. Vikram Bakhru	ConsejoSano	ConsejoSano
17. Abner Mason	ConsejoSano	ConsejoSano
18. Nicole Cook	ConsejoSano	ConsejoSano
19. Mitch Besser	AgeWell	AgeWell

Interviewees	Organization	Innovation
20. James Purvis	Trinity Health	AgeWell
21. Lorraine Marshall	Holy Cross Hospital	AgeWell
22. Tina Janis	Holy Cross Hospital	AgeWell
23. Gil Tinio	Holy Cross Hospital	AgeWell
24. Rebecca Castro	Holy Cross Hospital	AgeWell
25. Heather Martin	Holy Cross Hospital	AgeWell
26. Steven Sumner	U.S. CDC	Cardiff Violence Prevention Model
27. Jonathan Shepherd	Cardiff University	Cardiff Violence Prevention Model
28. Daniel Wu	Grady Health Hospital	Cardiff Violence Prevention Model
29. Marissa Mullins	Froedtert Hospital	Cardiff Violence Prevention Model
30. Stephen Hargarten	Medical College of Wisconsin	Cardiff Violence Prevention Model
31. Jennifer Hernandez Meier	Medical College of Wisconsin	Cardiff Violence Prevention Model
32. Sara Kohlbeck	Medical College of Wisconsin	Cardiff Violence Prevention Model
33. Sally Nusslock	West Allis Health Department	Cardiff Violence Prevention Model
34. Zengwang Xu	University of Wisconsin-Milwaukee	Cardiff Violence Prevention Model
35. Alice Kennedy	Dartmouth College	Swedish Quality Registry
36. Amber Barnato	Dartmouth College	Swedish Quality Registry
37. Aricca Van Citters	Dartmouth College	Swedish Quality Registry
38. Kathy Sabadosa	Dartmouth College	Swedish Quality Registry
39. Jake Casale	Dartmouth College	Swedish Quality Registry
40. Katherine Titus	Dartmouth College	Swedish Quality Registry
41. Meghan Holthoff	Dartmouth College	Swedish Quality Registry

Interviewees	Organization	Innovation
42. Inas Khayal	Dartmouth College	Swedish Quality Registry
43. Damara Crate	Dartmouth College	Swedish Quality Registry
44. Eugene Nelson	Dartmouth College	Swedish Quality Registry
45. Corey Siegel	Dartmouth College	Swedish Quality Registry