
Dissemination of Physical Activity Evidence, Programs, Policies, and Surveillance in the International Public Health Arena

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Abstract: The concepts of dissemination can be applied to the international challenges of promoting physical activity. With the 2004 release of the World Health Organization Global Strategy for Diet and Physical Activity, risk factor reduction and noncommunicable disease control are of global health interest. A six-step framework is proposed for understanding the attributes of successful international dissemination. These include the development of clear and evidence based resources or innovations, defining the target audience, selecting communication channels, engaging decision makers, and developing evaluation frameworks around dissemination. Four case studies to illustrate aspects of the framework are presented: (1) learning from dissemination of effective tobacco control initiatives, (2) the experience of developing global measures and surveillance systems for physical activity, (3) case study of disseminating the Agita program—an effective community wide intervention, and (4) disseminating the World Health Organization Global Strategy on Diet and Physical Activity. Substantial similarities across the experiences described in these case studies suggest underlying common themes for international dissemination, but developing a stronger evidence base for dissemination efforts remains a research priority. (Am J Prev Med 2006;31(4S):S57–S65) © 2006 American Journal of Preventive Medicine

Introduction

“Diffusion of innovations” research has been in existence for several decades,¹ but little has been applied to the transnational context. Dissemination of physical activity programs, strategies, and evidence has been usually considered in the context of implementing specific interventions, mostly at the local or regional level.² Dissemination is one step in the process of “diffusion” of an innovation communicated over time within defined social and cultural systems.³ The innovation may be any approach to physical activity promotion—interventions, policies, guidelines, or measurement techniques. Attributes of the innovation thought to be related to its adoption include advantage over existing programs or methods, compatibility with existing services and structures, simplicity to implement, capacity for initial trialing or

experimentation with the innovation, and recognition by many people.³

The Diffusion of Innovation theory, developed by Rogers,⁴ provides a hypothetical scenario of what usually happens when information is spread into a population.^{5,6} In the international context, diffusion is the process by which an innovation is communicated over time into or between new countries or regions,^{4,7} sometimes referring to the process of communication, and at other times describing the processes of changes in social norms or organizations required for population-level lifestyle and behavior change.

Dissemination is one part of the process of diffusion, which is composed of innovation development and testing, innovation dissemination, its adoption by a population, implementation into that population, and maintenance or sustainability of the innovation.^{3,8} Dissemination describes the process of communicating information (e.g., research or guidelines developed by professional associations) through defined channels and media (e.g., websites, journals, conferences, word of mouth, popular press) in order to reach various target groups (e.g., national policymakers, researchers, health professionals, or consumers).^{9–12}

This article provides a definition of dissemination, a framework for international approaches to physical activity diffusion and dissemination, and case studies

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from international initiatives to promote or assess physical activity. The framework includes a six-step approach to the dissemination of physical activity and public health (PAPH) work, with examples from the international arena. This is followed by four case studies of international dissemination from measurement through to policy, guidelines, and community-intervention dissemination.

A Six-Step Framework For International Physical Activity Dissemination

There are two groups of reasons to promote international dissemination of PAPH interventions and strategies. The first is the dissemination of evidence-based approaches to physical activity promotion, so that countries and international nongovernmental organizations can learn from experiences elsewhere. Given scarce resources for evidence generation, it is important to use existing evidence, and where possible, translate it into internationally usable policies and programs. The second reason is to understand the processes of diffusion and dissemination in an international context, so that subsequent innovations can be more effectively replicated and extended across countries and regions.

The six steps proposed in this model are:

- (1) Describe the innovation, its rationale and evidence base, and its relevance in an international context;
- (2) Describe the target audience for dissemination (professionals, general population) and the sequence, timing, and formatting of dissemination strategies;
- (3) Define the international communication channels for the innovation;
- (4) Determine the role of key policymakers and sustainable partnerships that are needed to implement the innovation at different levels (local, state, national, international);
- (5) Identify the barriers and facilitators of the innovation in the international context; and
- (6) Conduct research and evaluation to understand the dissemination process.

There are prerequisites for the dissemination of any public health problem. The issue should be important and solutions or effective interventions need to be described.¹³ Note that much of the intervention evidence in the peer-reviewed scientific literature may not be usable, especially in developing country setting, as evidence is generally based on controlled trial results that provide high internal validity, to maximize the scientific truth of the findings, rather than on the external validity or generalizability of the project.¹³⁻¹⁵ Interventions to increase physical activity usually emphasize their scientific quality¹⁶ and hence may be efficacious, but not widely adopted, following program evaluation. This highlights the differences between researchers generating evidence

and the practitioners and policymakers who need to use information for on-the-ground, affordable, and feasible population-wide programs.¹⁴ Some examples of PAPH topics suitable for dissemination are shown in the Appendix, Step 1.

The second step in the Appendix, defining the target audience, will depend on the level of dissemination. The largest scale is the global dissemination of a physical activity guideline or policy, with smaller efforts focusing on national or regional dissemination of PAPH evidence or programs. The third step is communication regarding physical activity, and this can occur through a range of internationally accessible channels, including the Internet, regional networks, and chat fora, as well as international training courses and workshops. Next is the identification of key policymakers and practitioners, shown as Step 4 in the Appendix, who may become the intermediaries and advocates for further dissemination. Their knowledge needs should be met first, to engage their commitment to the issue. This capacity building will have long-term benefits in the international context. The support of key policymakers and practitioners is necessary to garner sufficient resources with a long enough timeframe to start the process of translating, disseminating, and adopting a particular program.

Physical activity work usually involves regular interaction across multiple sectors and agencies¹⁷; partnerships or coalitions are required to enact and deliver the range of program elements required for a comprehensive approach to physical activity. The formation of sustainable partnerships, between practice and academia, and across other relevant agencies, will allow greater time for program adoption across geographic regions and professional groups. Dissemination work is optimized if elements are coordinated and supported by credible role models, well-known authority figures, or experts.

There are a range of potential barriers to the dissemination of PAPH information internationally (Step 5, Appendix). For many countries, an important barrier has been access to information. This is being overcome through widespread information distribution using Internet-based communications systems.¹⁸⁻²⁰ Barriers occur at the policy-development phase of disseminating innovations. Governments and decision makers who rank other public health issues as priorities are unlikely to divert resources to physical activity promotion. Cost is another barrier, and if the required initial investment is high then governmental agencies will approach this innovation with caution. A final barrier is when proposed interventions are too extensive or detailed to be afforded or planned within short time frames. The original diffusion of innovations framework identified that innovations needed to be affordable, and that investing in small steps and then reviewing progress would facilitate dissemination and adoption. The same is true of investment in physical activity, especially in

developing countries where physical activity may be a completely new component of noncommunicable disease (NCD) control programs.²¹ For example, a physician counseling program to advise patients about physical activity could be piloted in one region, or a policy initiative tested in one jurisdiction before being generalized across a country.

Most dissemination approaches are not evaluated (Appendix, Step 6). At the very least, process evaluation, or monitoring the implementation and adoption of an innovation is essential in assessing the reach of any program. For example, how many family physicians counseled their patients, how many children participated in physical education (PE) lessons across all schools, or how many people in the general community attended mass physical activity events? These process measures are the first step in the evaluation of the innovation, and should be carried out, even in developing or transitional countries with limited budgets. More-definitive steps in evaluation are then to assess the impact on the targeted populations: Did they increase their physical activity? This requires careful attention to research design and population measurement of physical activity. However, for a national program, even a quasi-experimental design with a comparison control group or region may be difficult to organize, and a time-series comparison in trends in the outcomes of interest may be the optimal research design.

International Examples of Dissemination of Physical Activity Programs or Initiatives

The international context poses challenges to the dissemination process. First, the contexts vary, and in some countries, physical activity initiatives are channeled through the health sector, whereas in other countries, sport or recreation agencies seem to be central advocates of the physical activity agenda through encouraging community-level participation. Sport-sector initiatives are prominent in Finland and New Zealand where the Push-Play Campaign, organized through SPARC (Federal Department of Sport) is central to physical activity promotion in the community and even in primary care settings.^{22,23} In other countries, nongovernmental agencies (NGOs) promote physical activity (Heartfile in Pakistan and Agita Mundo NGO, which started in Brazil).^{24,25} The extent of physical activity interest varies among countries; it is better recognized as a public health issue in countries with increasing NCD rates. There are also cultural and economic factors in each country and region that impede or facilitate the adoption of physical activity initiatives, which may be independent of the “epidemiologic case” for action, based solely on the NCD-related burden of disease.^{21,26}

The widespread lack of national coordination and accountability is a problem for physical activity innova-

tions. For example, the principles of having credible role models, having champions for the innovation, and focusing on changing sedentary social norms are seldom present.³ The networks for dissemination are patchy, especially in developing and transitional countries, and advocacy efforts are required to establish physical inactivity as an important NCD risk factor.

Nonetheless, there are examples and lessons from national and international experiences that illustrate dissemination of physical activity information. One important idea is that not all dissemination efforts are planned. Unplanned adaptation of new ideas occurs,⁴ often a result of local and national decisions and structures. This is not always productive; for example, Pentz describes the diffusion and widespread adoption of an ineffective public health program (the DARE [Drug Abuse Resistance Education] project) to prevent adolescent substance use. This was widely adopted as a potentially good idea, even though systematically demonstrated to be ineffective.^{27,28} However, not all unplanned or spontaneous dissemination is negative; good ideas can spread rapidly and widely if there is great need for them, even in the absence of a structured dissemination strategy.⁴ Innovators can act as initial catalysts, and innovative information can spread rapidly through national and international communication channels. These processes are illustrated in the case studies that follow on international dissemination of physical activity projects and initiatives. The four case studies are: (1) learning from the dissemination of tobacco control, (2) dissemination of physical activity measurement and surveillance systems, (3) a case study of disseminating a community-wide approach to increasing physical activity in South America, and (4) dissemination of the World Health Organization (WHO) Global Strategy on Diet, Physical Activity, and Health.

Case Study 1. International Experiences: The Dissemination of Information Regarding Tobacco Control

For public health research findings to have an impact on improving population health, they need to be effectively communicated to targeted audiences. Dissemination refers to the systematic process through which information messages are distributed, and by which intended audiences receive, accept, and utilize the information.³⁻⁵ Examples from transnational public health work around tobacco prevention are used to illustrate the principles of international dissemination.

The first studies on the adverse health effects of smoking appeared in the 1950s, but it was only in the early-to-mid 1960s that tobacco received widespread media publicity. Then health professionals and the public paid attention and initial actions were taken (e.g., warning label requirements).^{29,30} During the 1980s, Canada enacted federal cigarette excise taxes

and restricted tobacco advertising.^{30,31} Major anti-tobacco media campaigns began in Australia and parts of the United States.³²

By the late 1980s and 1990s, anti-tobacco efforts became well established in Western nations, relying on a variety of approaches (e.g., secondhand smoke prevention, advertising restrictions).³⁰ Other nations, including China, Brazil, and Japan, also started anti-tobacco efforts.^{31,33,34} A major recent achievement demonstrating that tobacco prevention and control were internationally accepted was the adoption of the WHO Framework Convention on Tobacco Control treaty in 2003.³⁵

For many years the major targets for anti-tobacco messages were healthcare providers (as communication intermediaries) and the general public itself, in the belief that messages about the dangers of smoking would discourage individual tobacco use.³⁰ By the early 1990s it was evident that policy interventions, particularly excise tax increases, tobacco advertising restrictions or bans, and secondhand smoke exposure policies were more effective.³⁰ This led to disseminating messages targeted more toward policymakers and journalists (e.g., through media advocacy).^{30,35,36}

There are several drivers for disseminating information for tobacco prevention and control. There is a strong evidence base.^{30,37} Tobacco use is recognized as an important problem, and some collaborative partnerships exist among researchers, anti-tobacco advocates, and policymakers; relationships with policy makers, however, depend on a variety of factors (e.g., policymakers' worldviews, campaign contribution sources).^{33,36} There are funded anti-tobacco governmental and non-governmental organization programs in some countries, but this varies between and within countries.³¹ Such programs are not institutionalized in the same way as immunization programs, and are subject to major cutbacks or elimination by policymakers.³⁸

The major contemporary barriers to tobacco control are counter-strategies used by the tobacco industry.^{31,33,36} Because of their large profits, these companies are powerful and influential political players internationally. This power has allowed them to support the publication of misleading or incorrect information ("manufacturing uncertainty"), or by preventing the continuation of effective anti-tobacco programs or policies.^{31,33,36} The intimidation of workers in government and other sectors by the tobacco industry or their representatives has resulted in reluctance to disseminate information altogether or emphasizing "politically safer" messages,³⁹ for example, stressing individual responsibility over environmental and regulatory approaches.

These lessons from the dissemination of tobacco control programs have implications for physical activity promotion. It is important to move beyond disseminating "information-only" strategies, and to develop policy and environmental supports for being active. Inter-

agency partnerships are important drivers of dissemination, as they increase communication channels and access to diverse populations and professionals.⁴⁰ Substantial funding commitments are required, for initial mass efforts at public education, followed by infrastructure developments to support the change. Finally, the "adversaries" of physical activity are less clear cut than for tobacco control, but may include industries that encourage sedentary pursuits (passive recreation, leisure, and entertainment industries) and increased car dependence (e.g., gasoline and automobile manufacturing industries).

Case Study 2. Physical Activity Measurements: Dissemination of the International Physical Activity Questionnaire (IPAQ) and the Behavioral Risk Factor Surveillance System (BRFSS)

IPAQ

The need for the standardized population measurement of physical activity is an important prerequisite for the public health surveillance of physical activity levels.⁴¹ The IPAQ instrument was developed between 1997 and 2003 to meet the needs of countries to compare population levels of physical activity.⁴² Up to that point, diverse surveys and measurement systems were in place with almost no comparability between countries and over time.

The IPAQ instrument was developed by a group of interested scientists in 1997, and went through stages of development, including cultural adaptations, formative testing, and international reliability and validity testing.⁴³ The IPAQ short form was a generic measure of all domains of physical activity (work, leisure, domestic, and active transport), with a long form IPAQ instrument expanding on each domain. Both forms and their scoring protocols are available online (see www.ipaq.ki.se). IPAQ was designed for use in surveillance only at the population level, to assess and compare physical activity prevalence rates within and between countries. The measurement studies showed that IPAQ was repeatable in diverse countries and had measurement properties similar to established self-report leisure time physical activity questionnaires.⁴³

The dissemination of IPAQ was unintended and unplanned. The original IPAQ group planned logically—measurement studies followed by a pilot set of comparative prevalence studies, using standard protocols and representative population samples, the International Prevalence Study. The perceived need for an international instrument was great, so interest in its use was noted by the WHO, other groups, and a panoply of researchers. The use of IPAQ started to spread, well before the original group had finished scientific testing. Some early uses of IPAQ were in surveillance systems in regional surveys in Europe and elsewhere⁴⁴

as well as in South America, Russia, and in the 2002 WHO World Health Survey. Some researchers started to use IPAQ to assess intervention effectiveness, even though this was not an original role for this measure. Finally, WHO developed an intermediate form of the IPAQ measure, known as the Global Physical Activity Questionnaire (GPAQ), which has physical activity domain-specific estimates, but is substantially shorter than the IPAQ long form (www.who.int/chp/steps/GPAQ/en/index.html). It is now used in regional risk factor monitoring, through the WHO STEPwise approach to chronic disease risk factor surveillance (STEPS) cardiovascular surveillance system. Globally, physical activity surveillance is far from solved by IPAQ or GPAQ, but this example illustrates the rapid adoption of these measures, a possible case of "premature dissemination," given the high perceived demand for such measures.

The IPAQ instrument addressed a long-standing unmet need for international physical activity measures, leading to its early adoption, perhaps even prematurely in terms of scientific testing. There was some research evidence available, but this was accumulating too slowly for policymakers, reflecting a tension between acute policy needs and the time taken for international (and in this case unfunded) collaborative research. The potential users of IPAQ were working independently of the IPAQ developers, and decisions were made in a fragmented way regarding its use or potential. Additional research groups started IPAQ testing, and finally, alternate measures such as GPAQ were developed. This case study illustrates the complexity of international dissemination of an innovative physical activity measurement and surveillance system.

BRFSS

A more systematic and controlled process was the development of telephone-based surveillance survey systems in the United States. This instrument, the BRFSS, was established in the early 1980s to monitor the prevalence of established health risk behaviors associated with premature mortality and morbidity through monthly telephone surveys of adults.⁴⁵⁻⁴⁷ From its onset, the BRFSS was designed to obtain on a regular basis data that were directly relevant to state public health programs, as such information was needed for planning and evaluation purposes.^{44,48}

Since its initial development, the BRFSS has diffused widely in the United States and in several other countries, including usage in parts of China, Russia, and Mexico.⁴⁶ Key components of international dissemination have been the contribution of regional and local health staff in (1) recognizing the value of locally relevant health risk behavior data, (2) working to help garner local resources and support, and (3) adapting data collection to local conditions. For example, data collection may require in-person interviews, carried out

in China,⁴⁶ where telephone-based surveys would be inappropriate. The international adaptation of BRFSS has been supported by Centers for Disease Control and Prevention staff, through the provision of technical support in survey implementation and in the reporting results to local stakeholders.⁴⁶

The success of the BRFSS as an innovation can be attributed primarily to its ability to address the unmet needs of public health program staff for data, and because of its flexibility and potential for adaptation.⁴ Because of the extensive input from health department program staff (as opposed to solely from researchers and survey experts), relevant data are obtained for program interests and activities. The BRFSS successfully addresses the need to collect comparable data across geographic areas, balanced against unique needs at the state or local level.

Dissemination of information about the BRFSS has occurred along several fronts. During the early 1980s, U.S. health department staff in early adopter states activated formal and informal communication networks among other states,⁴ leading to increased knowledge about the system and more widespread adoption. In 1992, Dr. David McQueen became the director of the BRFSS, and he functioned as a highly influential individual change agent and advocate for the system.⁴ Under McQueen's leadership, data collection was improved, and the visibility of the BRFSS was increased through presentations at scientific conferences and the publication of research studies in scientific journals.⁴⁹

Case Study 3. International Dissemination of the Agita São Paulo Program

The Agita São Paulo Program is a comprehensive community campaign for promoting physical activity and enhancing quality of life that targeted the entire population of 40 million in the Brazilian State of São Paulo.⁵⁰ The program was initiated in 1996 by an independent research institution (Centre for Laboratory Studies on Physical Fitness of São Caetano do Sul [CELAFISCS]) and soon gained the support of the state health secretariat. Agita São Paulo is built on a strong partnership model involving more than 300 institutions and explicitly focusing on both the governmental and nongovernmental sectors.⁵¹ Program awareness is greater than 60% among the adult population of São Paulo, and physical activity levels appear to be increasing.⁵² The Agita concept has spread across Brazil and Latin America. In this case study, we examine how this has occurred using the six-step framework for international physical activity dissemination (Appendix).

The first step was to accept the issue as worthy of dissemination, given the NCD burden in South America. Agita São Paulo advocated for comprehensive community

efforts to promote physical activity. It is theoretically and practically sound and has a clear theme and identity, making it a good candidate for message and concept dissemination. Agita is as much a philosophy as it is a program. The focus on social mobilization, pleasure, and inclusion reflect its Brazilian origin.⁵²

The next step is to identify the target group for the information being disseminated. The goal of disseminating Agita was to replicate the local physical activity program as a comprehensive state or national program. The Agita effort targeted influential leaders who could initiate large-scale programs at the city, state, or national level. Because Agita explicitly includes governmental and nongovernmental institutions, the target audience also includes leaders from both sectors: Ministers of health, mayors, prominent researchers and physicians, and community leaders. The common element linking these groups is the ability to mobilize resources and motivate the community around the promotion of physical activity.

Agita is an interesting example of international program dissemination because it depends on new dissemination technology and more traditional forms of communication. Agita has been disseminated internationally through four primary channels: scientific publications and presentations, networks, the conduct of "mega events," and effective personal contact with influential people. The first two approaches were facilitated through the distribution of physical activity-related information via the Internet. The Physical Activity Networks in the Americas¹⁸ plays an important role in organizing and delivering information. The Agita Mundo Network is even broader and connects and communicates with more than 200 organizations globally.²⁵

The remaining two dissemination strategies for Agita São Paulo are based on direct personal contact. Mega events, such as the 2002 WHO World Health Day, focused on physical activity and the subsequent derivative World Move for Health Day both focus attention on physical activity and the Agita identity to reach millions of people in thousands of events annually around the world.⁵³

The fifth step in the dissemination process considers barriers and drivers of dissemination. Drivers for the dissemination of Agita São Paulo include the increases in chronic diseases and obesity in most parts of the world, including Central and South America. Policy documents and physical activity manifestos were distributed and support obtained from international organizations. Dissemination has been constrained by limited financial and personnel resources, the inertia of health-care and public health systems at the national level, and an unwillingness of decision makers to consider physical inactivity as a serious issue. Priority is often given to the competing demands of other health issues. In general, the barriers have not greatly limited the reach or breadth of dissemination of the Agita message or

concept, but they have restricted the depth of adoption of more intensive physical activity programs.

The final step in the dissemination framework is an assessment of the balance between the costs and effects of dissemination. This analysis has not been carried out for Agita. Much of the dissemination utilizes networks, programs, and channels that serve multiple purposes so the direct costs of disseminating Agita São Paulo appear to be relatively low.

Case Study 4. The Global Strategy on Diet and Physical Activity: An Opportunity for Testing and Monitoring Dissemination

The Global Strategy on Diet and Physical Activity was developed by the WHO between 2002 and 2003, to act as a framework for developing diet and physical activity programs at the national level in response to the global increase in NCD.⁵⁴ Prior to the Global Strategy, WHO had shown increasing interest in the problem of escalating obesity, noncommunicable diseases, and in the global burden of chronic disease.⁵⁵ In addition, there were developing links between the Agita project and the WHO, which culminated in World Health Day in 2002 focusing on "Move for Health," and the later establishment of a global nongovernmental organization, Agita Mundo.

The Global Strategy development was guided by WHO and an Expert Reference Committee, and through widespread consultations with Health and other agencies in the WHO regions, as well as with the private sector and NGOs.⁵⁶ The Global Strategy was released in May 2004.⁵⁴ It functioned as a set of recommendations for countries interested in physical activity and health. Suggested strategies included interagency planning and partnerships, the need for national physical activity plans, and their integration with diet and obesity control programs.

The WHO offered the Global Strategy to countries to use and adopt for their own NCD prevention and control programs. The critical window of opportunity to assess physical activity levels and develop interagency partnerships to increase activity levels occurs the first few years after any Global Strategy is released. Regional physical activity networks¹⁸⁻²⁰ and regional WHO offices supported the Global Strategy and assisted countries with physical activity strategic planning.

The implementation of the Global Strategy presents an excellent opportunity for monitoring and researching the dissemination process, and further, the relationship between the adoption of Global Strategy elements and subsequent changes in physical activity prevalence.⁵⁶ The monitoring of physical activity prevalence, using instruments such as IPAQ and GPAQ are being used to assess population prevalence trends. Efforts at researching the dissemination process are

possible; for example, examining the attributes of countries who are early adopters of physical activity guidelines and programs will help to understand the processes of dissemination.

Discussion

Diffusion and dissemination efforts are likely to follow the usual S-shaped adoption curve in the international context. Some countries, individuals, and organizations are likely to be early adopters of physical activity and public health approaches, most will be intermediate, and a few will be later adopters, based on local NCD burden and their interest in physical activity. It is likely that the best efforts at dissemination will utilize clear and new physical activity messages, with a focus on solving increasing problems (such as the burden of chronic disease) and will be consistent with current preventive health approaches. Where no PAPH programs exist in a country, then decision makers will require a strong evidence base, clear population targets, strong champions and advocates, and sufficient resources and commitment to initiate innovative efforts. As well as considering the principles of dissemination, attention to local adaptation is important; definitions of physical activity, its local practice, and cultural identity differ among countries, and programs need to be developed using best practice principles^{21,26} but implemented in relevant ways for local programs.

The area of physical activity diffusion has benefited from global efforts to disseminate effective tobacco control strategies (Case Study 1). The history of tobacco control and the spread of evidence-based approaches, especially environmental and regulatory interventions, have provided a precedent for physical activity efforts. The impact of U.S. Surgeon General's (USSG) reports on tobacco (1964) and USSG reports on physical activity and health (1996) are noteworthy in reframing the prevention agenda, and establishing a climate for change internationally.⁵⁷

The four examples here were not designed to be comparable case studies. All describe different aspects of dissemination relevant to physical activity; the first one learning from tobacco, the second, an example of "premature dissemination" using IPAQ; the third, the natural history of dissemination of an idea Agita; and the fourth, dissemination research opportunities presented by the WHO global strategy. These four examples of international dissemination share some common elements, including strong advocacy, good communications between key individuals and institutions, and the presence of shared values and population-level approaches. The need for a strong evidence base is clear. An evidence base may be grounded in a systematic review process, with a strong public health focus, such as the *Community Guide for Physical Activity* interventions⁵⁸ married to a clear post-intervention public health dissemination approach.¹⁴⁻¹⁶ However, for some innovations, there is a

compelling need, which may outweigh the state of the evidence. Such an example is Case Study 2, where the need for international physical activity surveillance tools outweighed their research development; their spread and adoption was faster than the science that underpinned their testing.

The communication channels for international dissemination are sometimes formal, such as with established physical activity measures (BRFSS, Case Study 2), and sometimes informal (IPAQ and GPAQ, Case Study 2). Similarly, the community-wide Agita intervention (Case Study 3) was communicated through formal governmental and informal NGO networks, the so-called "two-hats" approach to message and strategy distribution.^{51,52}

Engagement with policy and decision makers was a key strategy for the Agita program, even reaching WHO Director-General level; obtaining support at that level attracted substantial transnational interest. Another component of the Agita program was its influential and committed leadership, ongoing staff commitment, and persistent physical activity advocacy at every opportunity. These efforts led to sustainable partnerships, finally at the international-network level; this provided an ongoing forum for new countries to participate in or adopt new physical activity elements as part of their health, sport, or physical activity program.¹⁹

Finally, the evidence base on "what works in dissemination" is at an early stage. Much of the information described here is based on expert opinion and experiences, but a conceptual six-stage framework is proposed for further examination. Testing these elements, in relation to physical activity program adoption and maintenance remains an evaluation challenge.⁵⁹ The reality of physical activity and public health has seen "dissemination before science" (IPAQ), and the need for evaluating international and global approaches (Case Study 4). In all cases, there is a real need for standardized efforts at process evaluation using checklists and monitoring systems. The development of international "dissemination research" has the potential to identify and classify effective system-level attributes. Such research could facilitate the more rapid translation of the physical activity and health evidence base into international programmatic action.

The findings and conclusions in this article are those of the authors and do not necessarily represent the views of the Centers for Disease Control and Prevention.

No financial conflict of interest was reported by the authors of this article.

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Appendix

Examples of the six-step model for disseminating international PAPH work

Step in the model	Examples from international PAPH practice
1. Describe the innovation and its rationale and evidence base	Develop new models for international physical activity surveillance systems (e.g., STEPS) or PA measurements (e.g., IPAQ, GPAQ) Describing PA promoting programs and developing frameworks for describing the attributes of best practice in PA (interventions and policies) for developed and developing countries ^{1–4}
2. Target audience and timing for the PAPH dissemination	There needs to be a defined dissemination agency; for example, WHO headquarters and Regional WHO office staff; national level policymakers; ministries of health, sport and/or education; national level experts and policymakers; Nongovernmental organizations concerned with NCDs (diabetes, cardiovascular disease) In addition, dissemination can occur through global or large scale regional PA networks such as the Physical Activity Network of the Americas, RAFA/PANA or the European Network for the Promotion of Health-enhancing Physical Activity, HEPA Europe ⁵ ; Asia-Pacific PA network (APPAN); or regional NGOs (such as Heartfile in Pakistan ⁶ or through nongovernmental NCD-related global organizations ^{7–8}
3. Select communication channels for the innovation	Media channels can be organized (through public education campaigns) or informal (through incidental use of the mass media); other channels may be existing PA networks; publications; training courses such as the International PAPH Training Course by the Centers for Disease Control and the International Union for Health Promotion and Education/IUHPE; or dissemination via individual PAPH experts
4. Determine the role of key policymakers and sustainable partnerships that are needed	International linkages such as regional networks including governmental and NGO sectors; possible role for private sector in some instances
5. Identify barriers and facilitators to the PAPH innovation	National and regional interagency PA policy committees and taskforces Barriers: competing public health priorities other than PAPH (such as infections disease control) or competition for resources within broad NCD prevention (such as resources for tobacco or injury control) may retard the dissemination of specific PAPH innovations; also consider local cultural and economic factors Facilitators: a supportive policy framework that provides resources for dissemination of new PAPH approaches
6. Research and evaluate to understand the PAPH dissemination process	Process monitoring of the implementation of a new approach; dissemination and uptake of PA guidelines

GPAQ, Global Physical Activity Questionnaire; HEPA, health-enhancing physical activity; IPAQ, International Physical Activity Questionnaire; NCD, noncommunicable disease; NGO, nongovernmental organization; PA, Physical activity; PAPH, physical activity and public health.

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