A Glossary for Dissemination and Implementation Research in Health

Borsika A. Rabin, Ross C. Brownson, Debra Haire-Joshu, Matthew W. Kreuter, and Nancy L. Weaver

Dissemination and implementation (D&I) research is increasingly recognized as an important function of academia and is a growing priority for major health-related funders. Because D&I research in the health field has emerged from research traditions in diverse disciplines ranging from agriculture to education, there are inconsistencies in the use and meaning of terms and main concepts. This glossary provides definitions for the key concepts and terms of D&I research in health (in both public health and clinical settings). Definitions are organized under five major sections: (1) foundation concepts; (2) types of research; (3) models, theories, and frameworks; (4) factors influencing the D&I processes; and (5) measurement/evaluation of the D&I process. The aim of this glossary is to aid in the development of more standardized and established terminology for D&I research, facilitate the communication across different stakeholders, and ultimately contribute to higher-quality D&I research.

KEY WORDS: dissemination, glossary, health research, implementation, public health, translation

Dissemination and implementation (D&I) research is increasingly recognized as an important function of academia and is a growing priority for major health-related funders (eg, the National Institute of Health [NIH], the Centers for Disease Control and Prevention [CDC]). One challenging aspect of D&I research is the lack of standardized terminology.[1–5] This can be partly explained by the relatively new appearance of D&I research on the health research agenda and by the great diversity of disciplines that made noteworthy contributions to the understanding of D&I research.[6–8] The most important contributions originate from the nonhealth fields of agriculture, education, marketing, communication, and management. The primary health-related areas presently contributing to D&I research include disability and rehabilitation, mental health, nursing, and cancer control.[6,9]

Definitions presented in this glossary reflect the terminology used in the most frequently cited manuscripts on D&I research in health and in funding announcements of major federal funding agencies (eg, the NIH, the CDC). To identify terms and definitions, we conducted an initial search of the English language literature and identified peer-reviewed manuscripts and documents from governmental agencies (ie, gray literature). Further articles and documents were identified from reference lists and expert recommendations by using snowball sampling.[10] A list of possible definitions was compiled (total $n = 105$), and expert discussion was used to select definitions to be included in the glossary. For each definition, we included the most relevant references so that readers may consult the literature for a more in-depth discussion of the term and its application.

Corresponding Author: Borsika A. Rabin, MPH, MS, Department of Community Health and Prevention Research Center, School of Public Health, Saint Louis University, 3545 Lafayette Ave, Salus Center 475, St Louis, MO 63104 (rabinab@slu.edu).

Borsika A. Rabin, MPH, MS, is a Doctoral Student and Research Assistant, Department of Community Health and Prevention Research Center, School of Public Health, Saint Louis University, St Louis, Missouri.

Ross C. Brownson, PhD, is a Professor, Department of Community Health and Prevention Research Center, School of Public Health, Saint Louis University, St Louis, Missouri.

Debra Haire-Joshu, PhD, is a Professor, Department of Community Health and Obesity Prevention Center, School of Public Health, Saint Louis University, St Louis, Missouri.

Matthew W. Kreuter, PhD, MPH, is a Professor, Department of Community Health and Health Communication Research, Laboratory and Center of Excellence in Cancer Communication Research, School of Public Health, Saint Louis University, St Louis, Missouri.

Nancy L. Weaver, PhD, MPH, is an Assistant Professor, Department of Community Health and Health Communication Research, Laboratory and Center of Excellence in Cancer Communication Research, School of Public Health, Saint Louis University, St Louis, Missouri.

J Public Health Management Practice, 2008, 14(2), 117–123

To facilitate our thinking and discussion on D&I research, we have organized terms under five major sections. The first section (Foundation Concepts) provides definition for the most commonly used terms in D&I research. The second section (Types of Research) identifies stages of the research process continuum and their relationship to D&I-related activities and defines varieties of type 1 and 2 research. In section 3 (Models, Theories, and Frameworks), we discuss the most commonly used models and frameworks that can inform planning and evaluation activities in D&I research. The fourth section (Factors Influencing Dissemination and Implementation Processes) defines key factors that are related to the success, speed, and extent of D&I. Finally, the fifth section (Measurement/Evaluation of D&I Processes) summarizes important concepts that should be considered when evaluating D&I research.

Foundation Concepts

Evidence-based intervention

The objects of D&I activities are interventions with proven efficacy and effectiveness (ie, evidence-based). Interventions within D&I research should be defined broadly and may include programs, practices, policies, and guidelines.[11] More comprehensive definitions of evidence-based interventions are available elsewhere.[12–16] In D&I research, we often encounter with complex interventions (eg, interventions using community-wide education) in which the description of core intervention components and their relationships involves multiple settings, audiences, and approaches.[17,18] For a more detailed discussion of complex interventions, refer to Hawe et al.[18]

Diffusion

Diffusion is the passive, untargeted, unplanned, and uncontrolled spread of new interventions. Diffusion is part of the diffusion-dissemination-implementation continuum, and it is the least-focused and intense approach.[19,20]

Dissemination

Dissemination is an active approach of spreading evidence-based interventions to the target audience via determined channels using planned strategies.[19,20]

Implementation

Implementation is the process of putting to use or integrating evidence-based interventions within a setting.[21,22]

Adoption

Adoption is the decision of an organization or a community to commit to and initiate an evidence-based intervention.[23–25]

Sustainability

Sustainability describes to what extent an evidence-based intervention can deliver its intended benefits over an extended period of time after external support from the donor agency is terminated.[26] As discussed below, three operational indicators of sustainability are (1) *maintenance* of a program's initial health benefits, (2) *institutionalization* of the program in a setting or community, and (3) *capacity building* in the recipient setting or community.[26]

Maintenance

Maintenance refers to the ability of the recipient setting or community to continuously deliver the health benefits achieved when the intervention was first implemented.[26]

Institutionalization

Institutionalization assesses to what extent the evidence-based intervention is integrated within the culture of the recipient setting or community through policies and practice.[25–27] Three stages that determine the extent of institutionalization are (1) passage (ie, a single event that involves a significant change in the organization's structure or procedures such as transition from temporary to permanent funding), (2) cycle or routine (ie, repetitive reinforcement of the importance of the evidence-based intervention through including it into organizational or community procedures and behaviors, such as the annual budget and evaluation criteria), and (3) niche saturation (the extent to which an evidence-based intervention is integrated into all subsystems of an organization).[26,28,29]

Capacity building

Capacity building is any activity (eg, training, identification of alternative resources, building internal assets) that builds durable resources and enables the recipient setting or community to continue the delivery of an evidence-based intervention after the external support from the donor agency is terminated.[26,28,30]

Other terms that are commonly used in the literature to refer to the program continuation include incorporation, integration, local or community ownership, confirmation, durability, stabilization, and sustained use.[29]

Types of Research

Type I (or translational) research

Type I translation research uses discoveries generated through laboratory and/or preclinical research to develop and test treatment and prevention approaches. In other words, type I clinical research moves science from "the bench" (fundamental research, methods development) to the patients' "bedside" (efficacy research).[24]

Fundamental (or basic) research

Fundamental or basic research develops laboratory-based, etiologic models to provide theoretical explanation for generic or more specific phenomena of interest.[24]

Efficacy research

Efficacy research evaluates the initial impact of an intervention (whether it does more good than harm among the individuals in the target population) when it is delivered under optimal or laboratory conditions (or in an ideal setting). Efficacy trials typically use random allocation of participants and/or units and ensure highly controlled conditions for implementation. This type of study focuses on internal validity or to establishing causal relationship between exposure to an intervention and an outcome.[24,31]

Type II (or translation) research

Type II translation research focuses on the enhancement of widespread use of efficacious interventions by the target audience. This type of research includes effectiveness research, diffusion research, dissemination research, and implementation research[24] and also referred to as "bedside to (clinical) practice" translation.[32]

Effectiveness research

Effectiveness research determines the impact of an intervention with demonstrated efficacy when it is delivered under "real-world" conditions. As a result, effectiveness trials often must use methodological designs that are better suited for large and/or less controlled research environments with a major purpose to obtain more externally valid (generalizable) results.[24,31]

Dissemination research

Dissemination research is the systematic study of processes and factors that lead to widespread use of an evidence-based intervention by the target population. Its focus is to identify the best methods that enhance the uptake and utilization of the intervention.[21,24,33,34]

Implementation research

Implementation research seeks to understand the processes and factors that are associated with successful integration of evidence-based interventions within a particular setting (eg, a worksite or school).[22,34] Implementation research assesses whether the core components of the original intervention were faithfully transported to the real-world setting (ie, the degree of fidelity of the disseminated and implemented intervention with the original study) and also concerned with the adaptation of the implemented intervention to local context.[22,34]

Another, often-overlooked but essential component of implementation research involves the enhancement of readiness through the creation of effective climate and culture in an organization or community.[9,35]

Further terms that are commonly used in the literature to denote type II research activities include knowledge transfer, knowledge exchange, and research utilization.[6,36]

Models, Theories, and Frameworks

Stage models

Stage models propose that D&I of interventions occurs as a series of successive phases rather than as one event.[7,23,37,38] Although different stage models vary in the number and name of the identified stages,[7] all models suggest that D&I does not stop at the level of initial uptake; further steps are necessary to ensure the long-term utilization of an intervention.[39] This article identifies the stages as dissemination, adoption, implementation, and sustainability. Other commonly used models are the innovation-decision process (knowledge, persuasion, decision, implementation, and confirmation)[23] and the stages of the RE-AIM framework (reach, adoption, implementation, and maintenance).[40] The different stages of the D&I process can be thought of as process variables or mediating factors (ie, factors that lie in the causal pathway between an independent variable [eg, the exposure to the intervention] and a dependent variable [eg, an outcome such as organizational change] and require different strategies and are influenced by different moderating variables).[41]

Theories and frameworks

Several theoretical concepts shape the way that we think about D&I research and guide our planning and evaluation activities.[6,33] The most commonly used theories and frameworks include the Diffusion of Innovations, Organizational Change, individual and organizational Decision-Making, and

Communication-Persuasion theories and the RE-AIM framework.[6,33,42] In this article we discuss one theory (Diffusion of Innovations) and one framework (RE-AIM) that are commonly applied in D&I research in the field of health. More comprehensive discussion of diffusion and D&I theories is available in Dearing.[43]

Diffusion of innovations

The diffusion of innovations theory was proposed by Rogers to explain the processes and factors influencing the spread and adoption of new innovations through certain channels over time.[23] Key components of the diffusion theory are (1) perceived attributes of the innovation, (2) innovativeness of the adopter, (3) social system, (4) individual adoption process, and (5) diffusion system.[43] Some of these key components are discussed later in this article.

RE-AIM framework

The RE-AIM framework developed by Glasgow and colleagues[31,44,45] provides a conceptual model to guide researchers and practitioners in the development of adequate multistage (reach, adoption, implementation, maintenance) and multilevel (individual, setting) indicators when evaluating D&I efforts.[40] A more comprehensive description of the RE-AIM framework and related tools can be found at http://www.re-aim.org/.

Factors Influencing D&I Processes

Fidelity

Fidelity measures the degree to which an intervention is implemented as it is prescribed in the original protocol.[7,24] Fidelity is commonly measured by comparing the original evidence-based intervention and the disseminated and implemented intervention in terms of (1) adherence to the program protocol, (2) dose or amount of program delivered, (3) quality of program delivery, and (4) participant reaction and acceptance.[46]

In case of complex interventions, the measurement of fidelity focuses more on the function and process of the intervention rather than on the individual components.[18] A more comprehensive discussion of fidelity measurement of complex interventions is found in Hawe et al.[18]

Reinvention/adaptation

Reinvention or *adaptation* is defined as the degree to which an evidence-based intervention is changed or modified by a user during adoption and implementation to suit the needs of the setting or to improve the fit to local conditions.[23] The need for adaptation and understanding of context has been called type 3 evidence (ie, the information needed to adapt and implement an evidence-based intervention in a particular setting or population).[12] Ideally, adaptation will lead to at least equal intervention effects as it is shown in the original efficacy or effectiveness trial.

To reconcile the tension between fidelity and adaptation, the core components of an intervention (ie, those responsible for its efficacy/effectiveness) must be identified and preserved during the adaptation process.[47] For a more comprehensive discussion of fidelity and adaptation, see Dearing.[43]

Although in this glossary it is defined differently, translation is another term commonly used in the literature to denote the adaptation of relevant research findings to make them useful for a variety of audiences.[48]

Factors associated with the speed and extent of dissemination and implementation

Several factors (ie, moderators) influence the extent to which D&I of evidence-based interventions occur in various settings.[23] Moderators are factors that alter the causal effect of an independent variable on a dependent variable.[41] In this case, organizational capacity can moderate the effect of an intervention on a desired outcome. These factors can be classified as the characteristics of the intervention, characteristics of the adopter (organizational and individual), and contextual factors. Adoption rate will be influenced by the interaction among the attributes of the innovation, characteristics of the intended adopters, and the given context.[9]

Characteristics of the intervention

Rogers identifies five perceived attributes of an innovation that are likely to influence the speed and extent of its adoption: (1) relative advantage (effectiveness and cost-efficiency relative to alternatives); (2) compatibility (the fit of the innovation to the established ways of accomplishing the same goal); (3) observability (the extent to which the outcomes can be seen); (4) trialability (the extent to which the adopter must commit to full adoption); and (5) complexity (how simple the innovation is to understand).[23,43] Relative advantage and compatibility are particularly important in influencing adoption rates.[23]

Characteristics of the adopters

Characteristics of the adopters can be discussed at the individual and organizational/community levels. Attributes of the organization/community include its size, formalization, perceived complexity, and readiness for the implementation of the innovation. The

characteristics, attitudes, and behaviors of individuals within an adopting organization (eg, position in the organization, education, individual concerns, and motivations) may also determine the uptake and use of an innovation.[49] Rogers classifies the individual adopters according to their degree of innovativeness into five categories: (1) innovators, (2) early adopters, (3 and 4) early and late majority, and (5) laggards.[23,43]

Contextual factors

Contextual factors include the political, social, and organizational settings for the implementation of the intervention and include social support, legislations and regulations, social networks, and norms and culture.[11,50] Understanding the delivery context for the intervention is essential for the success of the D&I and closely linked to the concepts of fidelity and adaptation.[51] Recent efforts in the organizational change literature discussed context in terms of the inner (organizational) context including structural and cultural features, and system readiness and the outer (interorganizational) context including interorganizational networks and collaborations.[9] They also identified several core aspects of context including leadership, infrastructure, and unit variability.[52]

Measurement/Evaluation of the D&I Process

In the context of measurement/evaluation, D&I research has to consider three main components: moderators (ie, factors associated with the speed and extent of dissemination and implementation), mediators (ie, process variables), and outcomes. Moderators and mediators are defined in a previous section of this article. The measurement of moderators and mediators can help identify the factors and processes that lead to the success or failure of an evidence-based intervention to achieve certain outcomes. To reflect the complexity of interventions and diversity in the interest of potential stakeholders (ie, policy makers, practitioners, clinicians), in D&I research we commonly measure multiple moderators, mediators, and outcomes, and assess their relationship.[53]

Outcome variables

Outcome variables, the end results of evidence-based interventions, in D&I research are often different from those in traditional health research and have to be defined broadly including short- and long-term outcomes, individual and organizational- or population-level outcomes, impacts on quality of life, adverse consequences, and economic evaluation.[11] Although individual-level variables can also be important (eg, behavior change variables such as smoking or physical activity), outcome measures in D&I research are typically measured at orgnizational, community, or policy level (eg, organizational change, community readiness for change).

Conclusion

In order for a field to prosper and thrive, a common language is essential. As is often the case when many disciplines and numerous organizations converge in development of a field, D&I research is characterized by inconsistent terminology.

When compiling this glossary, we encountered a number of challenges. The terminology and classification of terms differed both within and across countries. This article uses the term *dissemination and implementation research* to denote the newly emerging field in the United States; however, in other countries (eg, the United Kingdom, Canada), the term *population health intervention research* is commonly used to define this area of research.[54,55] Our research was limited to English language documents so we may have missed important information from non–English-speaking countries. Another challenge was the lack of consensus on the overall classification of terms in the literature that may lead to apparent contradictions. For example, this article defines the different stages (dissemination, adoption, implementation, and sustainability) of the process under the umbrella term "D&I research." Other stage models may discuss adoption and sustainability as a distinct stage.[46] Finally, it is important to note that the five-section classification introduced in this article was not developed to impose a rigid structure, rather it is used as an organizing framework that allows us to discuss terms in the domain where they are most commonly applied.

The purpose of this glossary is not to advocate or argue the superiority of one term or classification scheme over another, but to facilitate communication by beginning to define commonly used terms in D&I research for researchers, practitioners, policy makers, and funding agencies. A common language should help accelerate the scientific progress in D&I research by facilitating comparison of methods and findings, as well as identifying gaps in dissemination knowledge.

We believe that the "state of the art" is not advanced enough to resolve all of the existing inconsistencies and this glossary represents a starting point rather than the definitive language for D&I research. Given the increased interest and financial support from the NIH and the CDC, we anticipate that the terminology and frameworks for D&I research will be refined and expanded to reflect this evolving field. Finally, it is our hope that this

glossary, as a first step, will lead to agreed-upon terminology by initiating further dialogue among stakeholders and will ultimately contribute to higher-quality D&I research and more effective public health and clinical practice.

REFERENCES

1. National Center for the Dissemination of Disability Research. A review of the literature on dissemination and knowledge utilization. http://www.ncddr.org/kt/products/reviews/du/. Published 1996. Accessed September 8, 2007.
2. Fixsen DL, Naoom SF, Blase KA, et al. *Implementation Research: A Synthesis of the Literature*. Tampa, FL: National Implementation Research Network, University of South Florida; 2005.
3. Kerner J, Rimer B, Emmons K. Introduction to the special section on dissemination: dissemination research and research dissemination: how can we close the gap? *Health Psychol*. 2005;24:443–446.
4. Glasgow RE, Marcus AC, Bull SS, et al. Disseminating effective cancer screening interventions. *Cancer.* 2004;101(suppl 5):1239–1250.
5. Crosswaite C, Curtice L. Disseminating research results—the challenge of bridging the gap between health research and health action. *Health Promot Int*. 1994;9:289–296.
6. Dobbins M. *Is Scientific Research Evidence Being Translated Into New Public Health Practice*. Toronto, Ontario, Canada: Central East Health Information Partnership; 1999.
7. Mayer JP, Davidson WS. Dissemination of innovations. In: Rappaport J, Seidman E, eds. *Handbook of Community Psychology*. New York, NY: Springer; 2000:421–428.
8. Green LW, Johnson JL. Dissemination and utilization of health promotion and disease prevention knowledge: theory, research and experience. *Can J Public Health*. 1996;87(suppl 2):S11–S17.
9. Greenhalgh T, Robert G, Macfarlane F, et al. Diffusion of innovations in service organizations: systematic review and recommendations. *Milbank Q*. 2004;82:581–629.
10. Balbach ED. *Using Case Studies to Do Program Evaluation*. Sacramento, CA: California Department of Health Services; 1999.
11. Rabin BA, Brownson RC, Kerner JF, et al. Methodological challenges in disseminating evidence-based interventions to promote physical activity. *Am J Prev Med*. 2006;31(suppl 4):S24–S34.
12. Rychetnik L, Hawe P, Waters E, et al. A glossary for evidence based public health. *J Epidemiol Community Health*. 2004;58:538–545.
13. Sackett DL, Rosenberg WM, Gray JA, et al. Evidence based medicine: what it is and what it isn't. *BMJ*. 996;312:71–72.
14. Brownson RC, Baker EA, Leet TL, Gillespie KN. *Evidence-Based Public Health*. New York, NY: Oxford University Press; 2003.
15. Guyett G, Rennie D, eds. *Users' Guides to the Medical Literature. A Manual for Evidence-Based Clinical Practice*. Chicago, IL: American Medical Association Press; 2002.
16. Jenicek M. Epidemiology, evidenced-based medicine, and evidence-based public health. *J Epidemiol*. 1997;7:187–197.
17. Green LW, Kreuter M. *Health Program Planning: An Educational and Ecological Approach*. 4th ed. New York, NY: McGraw-Hill; 2004.
18. Hawe P, Shiell A, Riley T. Complex interventions: how "out of control" can a randomised controlled trial be? *BMJ*. 2004;328:1561–1563.
19. Lomas J. Diffusion, dissemination, and implementation: who should do what? *Ann N Y Acad Sci*. 1993;703:226–235; discussion 235–237.
20. MacLean DR. Positioning dissemination in public health policy. *Can J Public Health*. 1996;87(suppl 2):S40–S43.
21. National Center for Injury Prevention and Control (NCIPC). Program Announcement 07-001. http://www.cdc.gov/ncipc/erpo/faqs.htm. Published 2006. Accessed September 8, 2007.
22. National Institute of Health (NIH). Implementation and dissemination research in health (R21), program announcement 06-072. http://grants.nih.gov/grants/guide/pa-files/PAR-06-072.html. Published 2002. Accessed September 8, 2007.
23. Rogers EM. *Diffusion of Innovations*. 5th ed. New York, NY: Free Press; 2003.
24. Sussman S, Valente TW, Rohrbach LA, et al. Translation in the health professions: converting science into action. *Eval Health Prof*. 2006;29:7–32.
25. Hoelscher DM, Kelder SH, Murray N, et al. Dissemination and adoption of the Child and Adolescent Trial for Cardiovascular Health (CATCH): a case study in Texas. *J Public Health Manag Pract*. 2001;7:90–100.
26. Shediac-Rizkallah M, Bone L. Planning for the sustainability of community-based health programs: conceptual frameworks and future directions for research, practice, and policy. *Health Educ Res*. 1998;13:87–108.
27. Goodman RM, Steckler A. A model for the institutionalization of health promotion programs. *Fam Community Health*. 1989;11:63–78.
28. Pluye PL, Potvin L, Denis J. Making public health programs last: conceptualizing sustainability. *Eval Program Plann*. 2004;27:121–133.
29. Johnson K, Hays C, Center H, et al. Building capacity and sustainable prevention innovations: a sustainability planning model. *Eval Program Plann*. 2004;27:135–149.
30. Community Partnerships for Healthy Children (CPHC). *Spotlight: Funding Alternatives*. Vol 4. Sacramento, CA: A Sierra Health Foundation Initiative. 2002:1–4. http://www.sierrahealth.com. Accessed January 3, 2008.
31. Glasgow RE, Lichtenstein E, Marcus AC. Why don't we see more translation of health promotion research to practice? Rethinking the efficacy-to-effectiveness transition. *Am J Public Health*. 2003;93:1261–1267.
32. National Institute of Health (NIH). Roadmap for medical research. http://nihroadmap.nih.gov/. Published 2002. Accessed September 8, 2007.
33. Johnson JL, Green LW, Frankish CJ, et al. A dissemination research agenda to strengthen health promotion and disease prevention. *Can J Public Health*. 1996;87(suppl 2):S5–S10.
34. Centers for Disease Control and Prevention (CDC). Improving public health practice through translation research (R18). http://grants.nih.gov/grants/guide/rfa-files/RFA-CD-07-005.html. Published 2007. Accessed September 8, 2007.

35. Center for Mental Health in Schools. *Systemic Change and Empirically-Supported Practices: The Implementation Problem*. Los Angeles, CA: UCLA; 2006.
36. Jacobson N, Butterill D, Goering P. Development of a framework for knowledge translation: understanding user context. *J Health Serv Res Policy*. 2003;8:94–99.
37. Goodman RM, Tenney M, Smith DW, et al. The adoption process for health curriculum innovations in schools: a case study. *J Health Educ*. 1992;23:215–220.
38. Brownson RC, Ballew P, Dieffenderfer B, et al. What contributes to dissemination by state health departments of evidence-based interventions to promote physical activity? *Am J Prev Med*. 2007;33(suppl 1):S66–S73.
39. Oldenburg B, Hardcastle DM, Kok G. Diffusion of innovations. In: Glanz K, Lewis FM, Rimer BK, eds. *Health Behavior and Health Education: Theory, Research, and Practice*. 2nd ed. San Francisco, CA: Jossey-Bass Publishers; 1997:270–286.
40. Dzewaltowski DA, Estabrooks PA, Glasgow RE. The future of physical activity behavior change research: what is needed to improve translation of research into health promotion practice? *Exerc Sport Sci Rev*. 2004;32:57–63.
41. Last JM, ed. *A Dictionary of Epidemiology*. 4th ed. New York: Oxford University Press; 2001.
42. Glanz K. Perspectives on group, organization, and community interventions. In: Glanz K, Lewis FM, Rimer BK, eds. *Health Behavior and Health Education: Theory, Research, and Practice*. 2nd ed. San Francisco, CA: Jossey-Bass Publishers; 1997:389–403.
43. Dearing J. Evolution of diffusion and dissemination theory. *J Public Health Manag Pract*. 2008;14(2):94–103.
44. Glasgow RE, Klesges LM, Dzewaltowski DA, et al. The future of health behavior change research: what is needed to improve translation of research into health promotion practice? *Ann Behav Med*. 2004;27:3–12.
45. Glasgow RE, Vogt TM, Boles SM. Evaluating the public health impact of health promotion interventions: the RE-AIM framework. *Am J Public Health*. 1999;89:1322–1327.
46. Rohrbach LA, Grana R, Sussman S, et al. Type II translation: transporting prevention interventions from research to real-world settings. *Eval Health Prof*. 2006;29:302–333.
47. Castro FG, Barrera M, Jr, Martinez CR, Jr. The cultural adaptation of prevention interventions: resolving tensions between fidelity and fit. *Prev Sci*. 2004;5:41–45.
48. Brownson RC, Kreuter MW, Arrington BA, et al. Translating scientific discoveries into public health action: how can schools of public health move us forward? *Public Health Rep*. 2006;121:97–103.
49. Elliott JS, O'Loughlin J, Robinson K, et al. Conceptualizing dissemination research and activity: the case of the Canadian Heart Health Initiative. *Health Educ Behav*. 2003;30:267–282.
50. Waters E, Doyle J, Jackson N, et al. Evaluating the effectiveness of public health interventions: the role and activities of the Cochrane Collaboration. *J Epidemiol Community Health*. 2006;60:285–289.
51. Bauman LJ, Stein RE, Ireys HT. Reinventing fidelity: the transfer of social technology among settings. *Am J Community Psychol*. 1991;19:619–639.
52. Stetler CB, Ritchie J, Rycroft-Malone J, et al. Improving quality of care through routine, successful implementation of evidence-based practice at the bedside: an organizational case study protocol using the Pettigrew and Whipp model of strategic change. *Implement Sci*. 2007;2:3.
53. Glasgow RE. What outcomes are the most important in translational research? Presentation at: Proceedings of "From Clinical Science to Community: The Science of Translating Diabetes and Obesity Research" conference. National Institute of Health; 2004; Bethesda, MD.
54. Population Health Intervention Research. *Spotlight on Research*. Toronto, Ontario, Canada: Institute of Population and Public Health; 2007.
55. Millward L, Kelly MP. *Public Health Intervention Research: The Evidence*. London: Health Development Agency; 2003.