Health Education & Behavior
40(3) 257–265

DOI: 10.1177/1090198113486805
heb.sagepub.com
SAGE

What Does It Mean to Be Pragmatic? Pragmatic Methods, Measures, and Models to Facilitate Research Translation

Russell E. Glasgow, PhD[1]

Abstract

Background. One of the reasons for the slow and uncertain translation of research into practice is likely due to the emphasis in science on explanatory models and efficacy designs rather than more pragmatic approaches. *Methods.* Following a brief definition of what constitutes a pragmatic approach, I provide examples of pragmatic methods, measures, and models and how they have been applied. *Results.* Descriptions are provided of pragmatic trials and related designs, practical measures including patient-reported items for the electronic health record, and the Evidence Integration Triangle and RE-AIM practical models, each of which can help increase the relevance of research to policy makers, practitioners, and patients/consumers. *Conclusions.* By focusing on the perspective of stakeholders and the context for application of scientific findings, pragmatic approaches can accelerate the integration of research, policy, and practice. Progress has been made, especially in pragmatic trials but even more opportunities remain.

Keywords

evaluation, implementation, measurement, pragmatic trial, research design, theory

Wikipedia defines pragmatism as "a philosophical tradition centered on the linking of practice and theory" (http://en.wikipedia.org/wiki/pragmatism). It describes a process whereby theory is extracted from practice and applied back to practice to form what is called *intelligent practice.* Merriam Webster tells us that pragmatic approaches focus on matters of fact or practical affairs and are practical as opposed to idealistic (http://www.merriam-webster.com/dictionary/pragmatic). In reflecting on the current challenges facing health care, health education, and public health, I conclude that there is an increased need to be pragmatic. In this article, I overview pragmatic approaches in general and provide examples of pragmatic designs, measures, and models. The concluding section then discusses opportunities and challenges for pragmatic approaches, which I feel offer the best chance for more rapidly accelerating translation of research into practice and policy.

Both government and private funders in the United States have long supported both basic and applied scientific research. With the current health care crisis, continuing inequities in health and health care (Institute of Medicine, 2012; Starfield, Gervas, & Mangin, 2012) and demands from Congress and the public for science to be more accountable, the time seems right for adoption of more pragmatic approaches. This does not mean abandoning the scientific methods that have produced undeniable progress, but it does mean broadening our focus and placing greater priority on some issues that have received little or no attention (Glasgow, 2008; Green & Glasgow, 2006).

At the heart of pragmatic approaches to health research is keeping our focus on issues and data relevant for making decisions and taking action. In this way, pragmatic approaches are also strongly aligned with patient-centered outcomes research (Selby, Beal, & Frank, 2012; www.pcori.org) and comparative effectiveness research (Glasgow & Steiner, 2012; Institute of Medicine, 2011a). The overall goal of pragmatic approaches is to produce results that are relevant to stakeholders as well as rigorous (Glasgow & Chambers, 2012). As can be seen in Table 1, pragmatic approaches focus on application and context.

Pragmatic Designs

Pragmatic designs have received the greatest attention of the issues discussed in this article. Leaders from Centers for Medicare & Medicaid Services and the Agency for Healthcare Research and Quality published a key article in *Journal of*

[1]National Cancer Institute, Rockville, MD, USA

Corresponding Author:
Russell E. Glasgow, PhD, Division of Cancer Control and Population Sciences, National Cancer Institute, 1630 Executive Blvd., Rockville, MD 20852, USA.
Email: glasgowre@mail.nih.gov

Table 1. Key Characteristics of Pragmatic Approaches.

Pragmatic Component	Purpose	Key Factors	What Is Not Meant	Example References
Approach	To address specific, practice needs and questions	Focus on application and context, usefulness	That basic science is irrelevant; just need a balance	Pawson, Greenhalgh, Harvey, and Walshe (2005); Biglan (1995); Stange, Breslau, Dietrich, and Glasgow (2012)
Models and frameworks	Relatively simple, focus on relationships and context	Focus attention on key issues for success	That it is atheoretical or that theory is unimportant	Glasgow, Gaglio, et al. (2012); Kessler et al. (2012)
Designs	Address issues of practitioners, policy makers, and patients. Are both rigorous and relevant	Focus on resources, context, replication, applicability of results	That internal validity (or RCTs) are not relevant; just need a balance	Kessler and Glasgow (2011); Klesges, Estabrooks, Glasgow, and Dzewaltowski (2005); Thorpe et al. (2009)
Measures	To be feasible and actionable in real-world settings	Brief, broadly applicable, sensitive to change	That traditional psychometrics are irrelevant; just other issues equally or more important	Estabrooks et al. (2012); GEM (http://cancercontrol.cancer.gov/brp/gem.html)

the American Medical Association in 2003 that stimulated greater focus on "practical trials" (Tunis, Stryer, & Clancey, 2003). Other authors added to this literature and provided examples of practical alternatives to traditional designs that had focused almost exclusively on internal validity (Glasgow, Magid, Beck, Ritzwoller, & Estabrooks, 2005; Solberg et al., 2010). Pragmatic methods and, in particular, pragmatic trials were given a major impetus in 2008 with the CONSORT group publication of standards for pragmatic trials (Zwarenstein et al., 2008). Pragmatic trials are designed to answer the question of whether a program works under usual conditions, compared to explanatory trials that answer the question if an intervention works under ideal conditions. This publication and related development of the Pragmatic-Explanatory Continuum Indicator Summary (Glasgow, Gaglio, et al., 2012; Thorpe et al., 2009) that highlights 10 specific dimensions along which studies are more or less pragmatic versus explanatory (efficacy focused) have also contributed to the increased recognition of pragmatic studies. As seen in Figure 1, the extent to which a study is pragmatic versus explanatory on each of the 10 PRECIS dimensions (e.g., participant eligibility criteria, level of practitioner expertise, follow-up intensity, controls for practitioner adherence) can be succinctly summarized by the distance from the center of a "hub and spoke" figure. Most of these dimensions are relatively self-explanatory, but examples are provided in Thorpe et al. (2009) and Glasgow, Gaglio, et al. (2012). On each dimension, the study is rated from 0 (*being completely explanatory*, and the score indicated by a mark for this dimension being in the center of the PRECIS figure) to 4 (*being completely pragmatic*, and a dot or mark placed at the extreme end of the "line" for that dimension in the PRECIS figure). Thus, with a glance, it can be seen that Study A on the left-hand side of Figure 1 is much more pragmatic, especially on the dimensions on the left, top, and bottom of the diagram—for example, practitioner expertise, flexibility of the intervention, practitioner adherence—than Study B on the right-hand side of the figure, which might represent a traditional efficacy study conducted under highly controlled homogenous conditions.

Key features of pragmatic studies and important ways in which they differ from efficacy studies are that: (a) the questions, perspectives taken, and outcomes studied are those that are important to stakeholders such as policy makers, practitioners, and patients; (b) the research is conducted in multiple, heterogeneous settings similar to those in practice; (c) there are few exclusion criteria and characteristics of participants (patients) resemble those seen in typical practice; and (d) comparison conditions are real-world alternatives—for example, current standard of care, rather than no treatment or placebo controls (Glasgow et al., 2005; Tunis et al., 2003; Zwarenstein & Treweek, 2009).

The National Institutes of Health has recently announced support for pragmatic trials in the Health Care Systems Collaboratory specifically (http://commonfund.nih.gov/hcscollaboratory/) and more generally through other funding mechanisms (e.g., the Dissemination and Implementation Research in Health Program Announcement 13-055; http://grants.nih.gov/grants/guide/pa-files/PAR-13-055.html). Much of the Veteran Administration's QUERI program and of the new research being funded by the Patient-Centered Outcomes Research Institute can be considered pragmatic research (Damush et al., 2010; www.PCORI.org).

Pragmatic Measures

Assessing outcomes that are important to key stakeholders is part of the answer to increasing research relevance (Proctor et al., 2011). However, the measures through which those outcomes are assessed also need to be pragmatic in order to

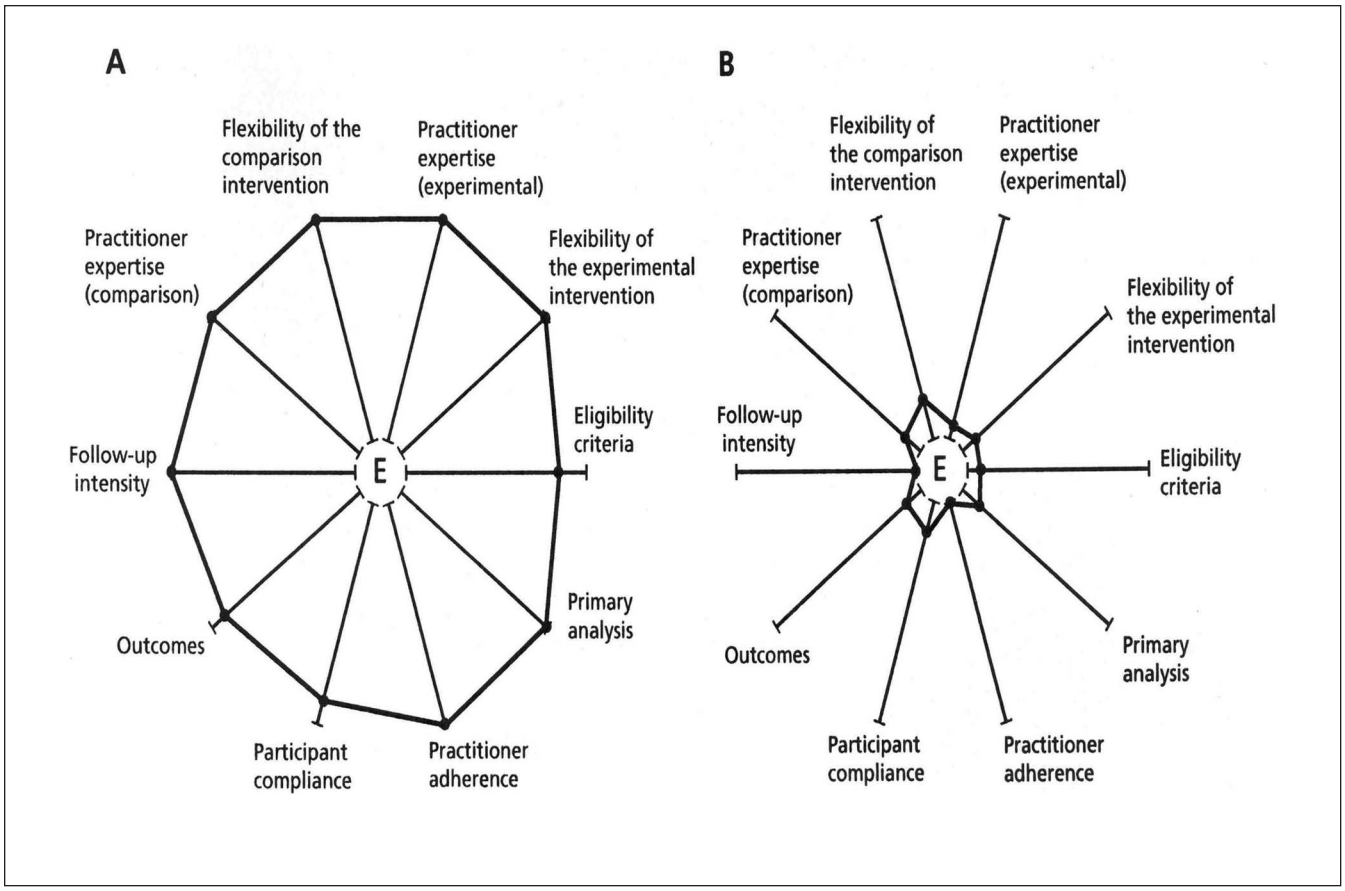

Figure 1. Illustration of application of the PRECIS criteria to characterize research studies.

be feasible to collect in typical and often busy real-world settings having multiple competing demands and for whom research is not their primary business (Mays & Hogg, 2012; Nutting et al., 1999; Stange, Woolf, & Gjeltema, 2002). Many measures in health services research are so lengthy or burdensome that they are difficult or impossible to collect in real-world settings, especially if not administered by research personnel (Glasgow, Kaplan, Ockene, Fisher, & Emmons, 2012). Recent advances in electronic health records (EHRs) offer great potential to address this situation, but there is an important gap. It is ironic in this era of the patient-centered medical home (Crabtree et al., 2010) and patient-centered care (Institute of Medicine, 2011b) that the content area least often included in any systematic, standardized, or searchable way in the EHR is patient-reported measures.

Estabrooks et al. (2012) describe an iterative, participatory process used to identify practical patient-report measures of health behaviors and psychosocial issues that are feasible to use in most adult primary care offices and be included in EHRs. As shown in Table 2, they used a series of "pragmatic measures criteria" in addition to more traditional psychometric characteristics to identify measures for this purpose. Key characteristics for pragmatic measures included features such as breadth of applicability, face validity, being actionable, not producing adverse reactions or consequences, and sensitivity to change as important issues to consider in selecting measures.

Like pragmatic designs, pragmatic measures emphasize context and appropriateness for specific settings in which measures will be used (Stange, Breslau, Dietrich, & Glasgow, 2012). The culture change that is required for pragmatic measures is, once again, having the perspective of the user take precedence over other considerations. Frequently this means above all being brief enough and understandable enough to be administered, scored, and the results interpreted and acted on in the context of usual care and in low resource settings. Other considerations include being broadly applicable across patients (practitioners are unlikely to use different measures with different scales and interpretations for different subsets of patients) and also having to compromise on some psychometric characteristics (and usually comprehensiveness/length) to make the measure feasible to implement (Glasgow & Riley, in press).

Pragmatic Models and Frameworks

Various levels and types of theories, models, and frameworks are used in science and health (Glanz, Lewis, & Rimer, 2002;

Table 2. Recommended Characteristics of Pragmatic Measures and Metrics.

Characteristic	Recommended Criteria
Reliable	Especially test–retest (less on internal consistency)
Valid	Construct validity, criterion validity, established norms
Sensitive to change[a]	Suitable for longitudinal use, goal attainment tracking, repeated administration
Feasible[a]	Brief (generally three items or less); low respondent and staff burden; easy to score/interpret
Important to practitioners	Indices for health conditions that are prevalent, costly, challenging
Public health relevance	To address without measures, in primary care domain, related to Healthy People 2020 goals
Actionable[a]	Realistic actions such as reliable referral, immediate discussion, online resources
User friendly	Patient interpretability; face validity; meaningful to practitioners, public health officials, policy and decision makers
Broadly applicable	Available in English and Spanish, validated in different cultures and contexts
Cost	Publicly available or very low cost
Enhances patient engagement	Having this information is likely to further patient involvement in their care and decision making
Cause no harm	Does not produce unintended consequences or make clinic responsible for things it cannot address

[a]These criteria were given special emphasis.
Source. Adapted from Estabrooks et al. (2012).

Glasgow & Linnan, 2008). The philosophical roots of modern-day pragmatism lie in objections to some features of logical positivism (Pierce, 1935) and were advanced by thought leaders such as William James and John Dewey. As used in this article, pragmatic models are concerned with application to practice. As opposed to grand theories, they are usually at a moderate level of specificity and are constructed to apply to concrete situations. To be useful, pragmatic models emphasize key issues that are important to address for successful implementation or evaluation. Like most models, pragmatic models are simplifications of reality, and as George Box is quoted as saying, "Are wrong . . . but some may be useful" (Box & Draper, 1987). Health education and implementation science employ several different types of models and frameworks. For the purpose of this article, I focus on two key implementation science conceptual needs: theories or models of intervention that guide what should be done to produce successful outcomes; and models or evaluation frameworks that guide the types of questions that should be asked to assess how successful intervention efforts have been.

What makes both types of models pragmatic (vs. explanatory) is *how useful they are in guiding action in real-world settings*. Thus, pragmatic models are generally more concrete and specific than abstract theories. There are many well-established health behavior theories (Glanz et al., 2002), evaluation models (Harris, 2010; Veney & Kaluzny, 2005), and a rapidly increasing number of implementation science models (Tabak, Khoong, Chambers, & Brownson, 2012). Many theories and models, however, are inordinately complex, consistent of a huge number of steps or component parts in an effort to be comprehensive, and often contain substantial jargon and terminology specific to the model that make them challenging to implement or to share with community practitioners and stakeholders. Here, given space limitations, I focus on one intervention model—the Evidence Integration Triangle (EIT; Glasgow, Green, Taylor, & Stange, 2012) and one evaluation framework—the RE-AIM model (Glasgow et al., 2010; Kessler et al., 2012) with which to illustrate features of pragmatic models. This is not meant to imply that these are the best models; simply that they are the ones with which I am most familiar.

The EIT (Glasgow, Green, et al., 2012) is a recent model designed to be helpful for both stakeholder groups as well as researchers to focus attention on the need for three interconnected components for successful programs or policies. These components include—an evidenced-based intervention (which can be a policy, preventive action, or an intervention program), a practical measure or set of measures to longitudinally track progress, and ongoing implementation of partnership principles among stakeholders. Each of these three is necessary but not sufficient and must be selected to fit or align with the multilevel context (Figure 2) in which the activity takes place. The other pragmatic implication of the EIT is that programs are rarely successful as initially implemented and need to evolve and adapt to changing context in order to be successful and sustained (Glasgow & Chambers, 2012).

The RE-AIM framework is more established, having first appeared in 1999. It has been widely used to evaluate and review the literature in both health behavior change and public health areas (Jilcott, Ammerman, Sommers, & Glasgow, 2007; King, Glasgow, & Leeman-Castillo, 2010). It has been used more recently to help design programs intended to be broadly implemented (Glasgow et al., 2010; Klesges, Estabrooks, Glasgow, & Dzewaltowski, 2005) and to reduce health disparities (Bennett et al., 2012; Toobert, Glasgow, Strycker, Barrera, & King, 2012). RE-AIM focuses attention

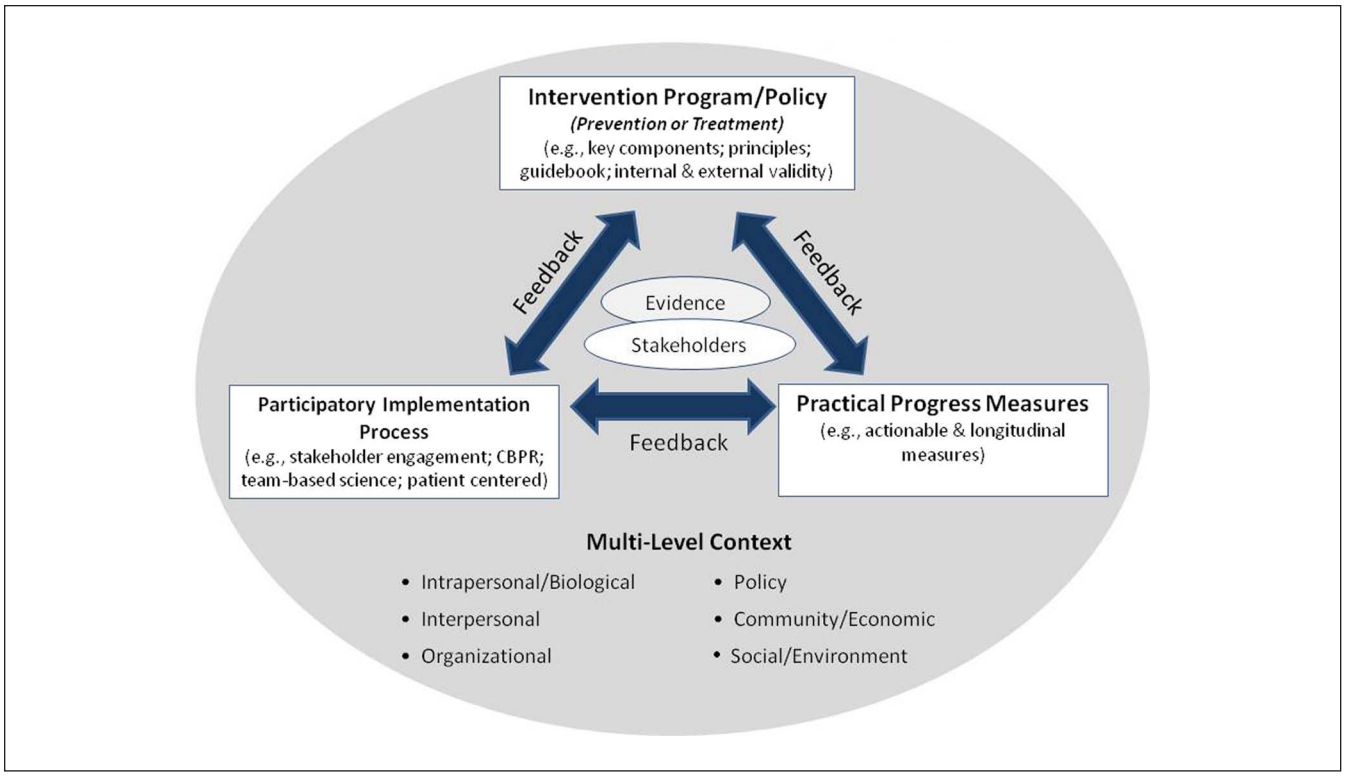

Figure 2. Evidence Integration Triangle (EIT) model.

Table 3. RE-AIM Guidelines for Developing, Selecting, and Evaluating Programs and Polices Intended to Have a Public Health Impact.

RE-AIM Element	Guidelines and Questions to Ask
Reach: Percent and representativeness of participants	Can the program attract large and representative percent of target population? Can the program reach those most in need and most often left out (i.e., older adults, the poor, low literacy, and numeracy?)
Effectiveness: Impact on key outcomes, quality of life, unanticipated outcomes, and subgroups	Does the program produce robust effects and across subpopulations? Does the program produce minimal negative side effects and increase quality of life or broader outcomes?
Adoption: Percent and representativeness of settings and staff that participate	Is the program feasible for most real-world settings (costs, expertise, time, resources, etc.)? Can it be adopted by low-resource settings and typical staff serving high-risk populations?
Implementation: Consistency and cost of delivering program and adaptations made	Can the program be consistently implemented across program elements, different staff, time, etc.? Are the costs—personnel, up-front, marginal, scale-up, equipment—reasonable to match effectiveness?
Maintenance: Long-term effects at individual and setting levels, modifications made	Does the program include principles to enhance long-term improvements (i.e., follow-up contact, community resources, peer support, ongoing feedback)? Can the settings sustain the program over time without added resources and leadership?

Source. Adapted from Toobert, Glasgow, Strycker, Barrera, and King (2012).

on five dimensions or factors (Reach, Effectiveness, Adoption, Implementation, and Maintenance) that are common challenges to programs being successful in "going to scale" or achieving desired applied outcomes (www.re-aim.org). As shown in Table 3, common issues across the RE-AIM dimensions include representativeness of participants, staff, and settings involved; health disparities impact across multiple levels; consistency, cost, and quality of implementation; and sustainability of both outcomes and the intervention or policy (Kessler et al., 2012). Both of these pragmatic models are intended to increase the transparency of research and results reporting to make it easier for practitioners and policy

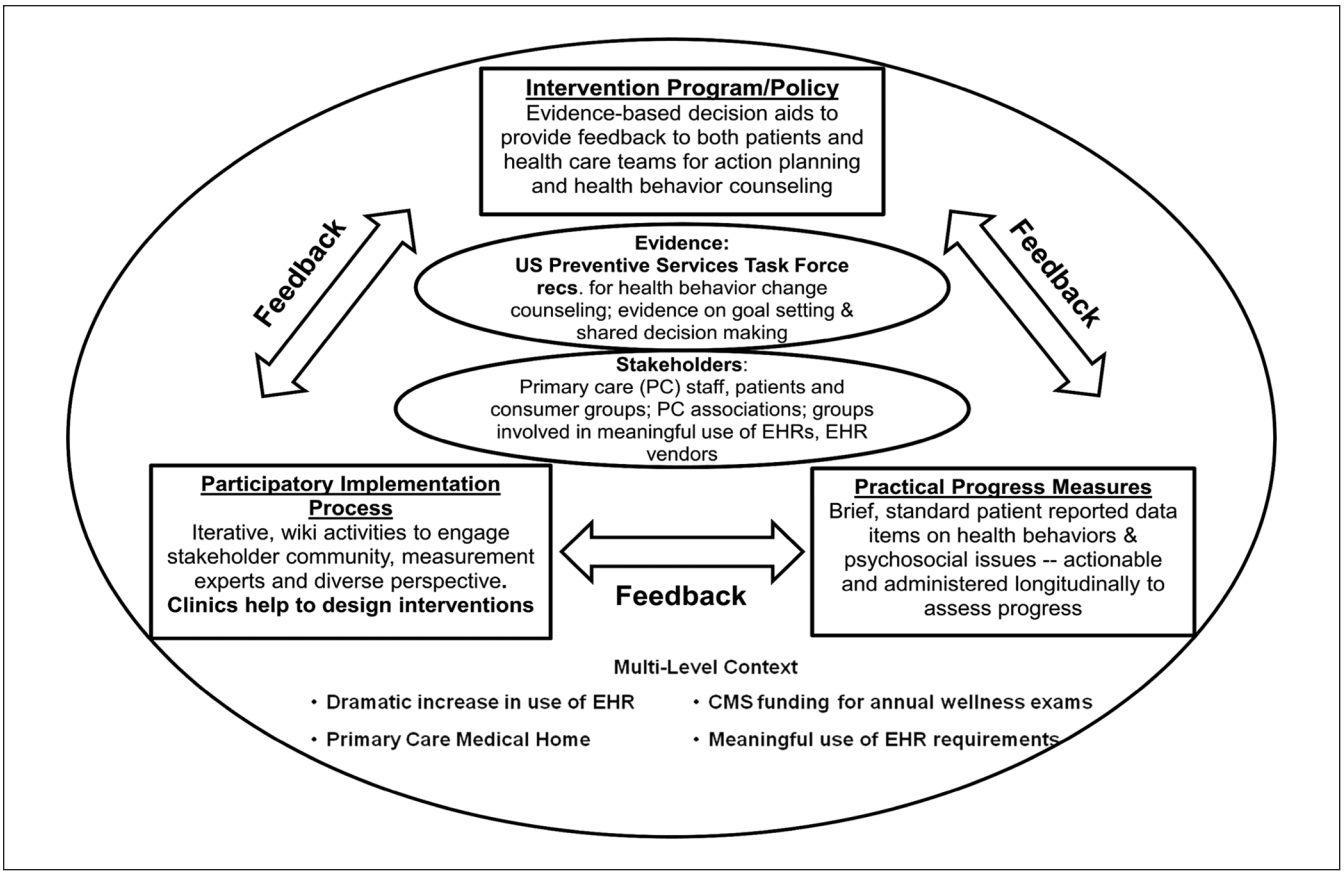

Figure 3. Application of the EIT to patient-reported health issues.

makers to determine the breadth and local applicability of a program or policy.

Integrative Example

An ongoing project serves to illustrate the integration of pragmatic models, methods, and measures. The EIT (Glasgow, Green, et al., 2012) helps conceptualize the necessary evidence-based interventions, pragmatic measures, and participatory processes needed to increase the frequency and quality with which health behavior and psychosocial issues are addressed in diverse primary care settings. As shown in Figure 3, the evidence-based interventions were taken from literature reviews and U.S. Preventive Services Task Force recommendations (http://www.uspreventiveservicestaskforce.org/) for primary care based health behavior counseling and treatment of depression and anxiety. A series of 17 items assessing 10 different health behavior and psychosocial issues, as well as overall quality of life, shown in Table 4 were identified using iterative expert opinion and crowd sourcing approaches described in Estabrooks et al. (2012). As can be seen, almost all of these items are very brief, have national norms, and are practical to use in primary care settings. These items are the practical progress measures that are designed to be used longitudinally over time to evaluate patient health status and progress on these behavioral and mental health issues.

Participatory processes included formative evaluation and obtaining stakeholder input from four different perspectives—health care decision makers, practitioners, patient advocates, and primary care researchers (Estabrooks et al., 2012). In addition, participating research teams and practices were engaged in developing the final protocol, including what "essential features" needed to be implemented (e.g., the patient report survey items in Table 3, feedback to providers and patients, process and implementation measures to be collected) and what aspects of the study could be customized to the local setting (e.g., where in the clinic flow these questions were asked, who on the primary care team went over the survey results with patients, who developed the collaborative action plan with the patient, how follow-up was conducted). The practical trial design is a cluster randomized delayed intervention pragmatic implementation study being conducted in nine pairs of diverse primary care clinics in

Table 4. Domains and Items Selected for Patient Reported Health Behavior and Psychosocial Issues.

Domain	Final Measure (Source)
1. Demographics	Nine items: sex, date of birth, race, ethnicity, English fluency, occupation, household income, marital status, education, address, insurance status, veteran's status. Multiple sources including: Census Bureau, Institute of Medicine, and National Health Interview Survey
2. Overall Health Status	One item: Behavioral Risk Factor Surveillance System (BRFSS) Questionnaire
3. Eating Patterns	Three items: Modified from Starting the Conversation (STC) (adapted from Paxton, Strycker, Toobert, Ammerman, & Glasgow, 2011)
4. Physical Activity	Two items: The Exercise Vital Sign (Sallis, 2011)
5. Stress	One item: Distress Thermometer (Roth et al., 1998)
6. Anxiety and Depression	Four items: Patient Health Questionnaire–Depression & Anxiety (PHQ-4) (Kroenke, Spitzer, Williams, & Löwe, 2009)
7. Sleep	Two items: (a) Adapted from BRFSS; (b) Neuro-QOL (Item PQSLP04)
8. Smoking/Tobacco Use	Two items: Tobacco Use Screener (adapted from Youth Risk Behavioral Surveillance System Questionnaire)
9. Risky Drinking	One item: Alcohol Use Screener (Smith, Schmidt, Allensworth-Davies, & Saitz, 2009a)
10. Substance Abuse	One item: NIDA Quick Screen (Smith, Schmidt, Allensworth-Davies, & Saitz, 2009b)

different types of health care organizations (e.g., federally qualified community health centers, practice-based research networks) in the Northeast, East, South, Midwest, Northwest, and Southwest of the United States.

Opportunities and Challenges for Pragmatic Approaches

This article has outlined initial steps and progress to date in the development and implementation of pragmatic designs and methods, measures, and models. Other examples could have been chosen: these are simply the ones with which I have the greatest familiarity. There are also several areas in which pragmatic approaches seem particularly appropriate. These include comparative effectiveness research (Glasgow & Steiner, 2012; Institute of Medicine, 2011a; Selby et al., 2012), especially the patient-centered issues addressed by Patient-Centered Outcomes Research Institute (http://www.pcori.org/). Another area that could benefit from concerted pragmatic research and development concerns understanding of context (Stange & Glasgow, 2012). Pragmatic studies are very context dependent, and reports of pragmatic studies should report on the multilevel context within which they are conducted to allow potential adopters determine the applicability to their setting. Although there is close to universal agreement on the importance of context, at present there are no widely accepted or standard approaches to describing or assessing context. Development of pragmatic approaches to the study of context would significantly advance the field. One reviewer for this article made the point that there is also a converse problem with non-evidence-based approaches being prematurely adopted in practice, such as the Drug Abuse Resistance Education program for substance abuse prevention. Pragmatic approaches could also be used to develop and evaluate strategies to "de-implement" such programs.

Key issues and debates about pragmatic approaches concern their size, cost, and how rapidly they should produce results. Some think that pragmatic approaches, because they are likely to encounter greater variability in both implementation and outcomes than efficacy studies, need to be large and by implication costly. Others argue that even if large in numbers, pragmatic studies need not be costly or slow, especially if pragmatic measures such as appropriately "cleaned" EHR data (Kiefe & Allison, 2012) are used as outcomes.

There are ongoing debates about research design in pragmatic trials, parallel to those concerning comparative effectiveness (Dentzer, 2012; Luce, 2010), especially concerning the advantages and limitations of randomized trials (Dentzer, 2012; Glasgow & Linnan, 2008; Kessler & Glasgow, 2011). My opinion is that we need to encourage multiple approaches to research design, consider the reasons why and when results converge and diverge across methods, and pay greater attention to issues of replication and integrating results across methods.

There are differences of opinion concerning appropriate outcomes for pragmatic research. Some grant and journal article reviewers think that biologic outcomes or biomarkers should always be included and are the ultimate outcomes and purpose of health research. In contrast, others, including myself, feel that given the current status of research, more emphasis is needed on implementation outcomes as well as the ultimate outcomes of population health and functioning.

The above are brief and possibly biased perspectives on some of the key current and emerging issues within pragmatic approaches. The opinions represented are my own, do not necessarily represent those of the National Cancer Institute or National Institutes of Health, and are intended to stimulate thinking, reflection, and discussion; not to prematurely conclude or limit debate. The field is relatively new and rapidly evolving, and I have certainly not included all the methods and issues addressed by pragmatic approaches. Pragmatic

approaches are not without their limitations and are explicitly an attempt to achieve a better balance between internal and external validity criteria, not to undermine internal validity or experimental rigor. Greater attention to pragmatic methods, measures, and models offers great potential to produce more rapid and relevant answers for research dollars expended and to help integrate research, practice, and policy.

Author's Note

The opinions expressed in this article are those of the author and do not necessarily reflect the official policy or views of the National Cancer Institute. Several of the ideas discussed in this article were included in Dr. Glasgow's talk as part of receipt of the Elizabeth Fries Award for public health education research at the Society of Public Health Education in San Francisco in October 2012.

Declaration of Conflicting Interests

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author received no financial support for the research, authorship, and/or publication of this article.

References

Bennett, G. G., Warner, E. T., Glasgow, R. E., Askew, S., Goldman, J., & Ritzwoller, D. P. Be Fit Be Well Study Investigators (2012). Obesity treatment for socioeconomically disadvantaged patients in primary care practice. *Archives of Internal Medicine*, *172*, 565-574.

Biglan, A. (1995). *Changing cultural practices: A contextualist framework for intervention research*. Reno, NV: Context Press.

Box, G. E. P., & Draper, N. R. (1987). *Empirical model-building and response surfaces* (1st ed.). New York, NY: John Wiley.

Crabtree, B. F., Nutting, P. A., Miller, W. L., Stange, K. C., Stewart, E. E., & Jaen, C. R. (2010). Summary of the National Demonstration Project and recommendations for the patient-centered medical home. *Annals of Family Medicine, 8*(Suppl. 1), S80-S90.

Damush, T. M., Jackson, G. L., Powers, B. J., Bosworth, H. B., Cheng, E., Anderson, J., & Plue, L. (2010). Implementing evidence-based patient self-management programs in the Veterans Health Administration: Perspectives on delivery system design considerations. *Journal of General Internal Medicine, 25*(Suppl. 1), 68-71.

Dentzer, S. (Ed.). (2012). Current challenges in comparative effectiveness research. *Health Affairs*, 31(10).

Estabrooks, P. A., Boyle, M., Emmons, K. M., Glasgow, R. E., Hesse, B. W., Kaplan, R. M., & Taylor, M. V. (2012). Harmonized patient-reported data elements in the electronic health record: Supporting meaningful use by primary care action on health behaviors and key psychosocial factors. *Journal of the American Medical Informatics Association*, *19*, 575-582.

Glanz, K., Lewis, F. M., & Rimer, B. K. (2002). *Health behavior and health education: Theory, research and practice* (3rd ed.). San Francisco, CA: John Wiley.

Glasgow, R. E. (2008). What types of evidence are most needed to advance behavioral medicine? *Annals of Behavioral Medicine*, *35*, 19-25.

Glasgow, R. E., & Chambers, D. (2012). Developing robust, sustainable, implementation systems using rigorous, rapid and relevant science. *Clinical and Translational Science*, *5*, 48-55.

Glasgow, R. E., Dickinson, P., Fisher, L., Christiansen, S., Toobert, D. J., Bender, B. G., & Estabrooks, P. A. (2010). Use of RE-AIM to develop a multi-media facilitation tool for the patient-centered medical home. *Implementation Science*, *6*, 118. doi:10.1186/1748-5908-6-118

Glasgow, R. E., Gaglio, B., Bennett, G., Jerome, G. J., Yeh, H. C., Sarwer, D. B., & Wells, B. (2012). Applying the PRECIS criteria to describe three effectiveness trials of weight loss in obese patients with comorbid conditions. *Health Services Research*, *47*, 1051-1067.

Glasgow, R. E., Green, L. W., Taylor, M. V., & Stange, K. C. (2012). An evidence integration triangle for aligning science with policy and practice. *American Journal of Preventive Medicine*, *42*, 646-654.

Glasgow, R. E., Kaplan, R. M., Ockene, J. K., Fisher, E. B., & Emmons, K. M. (2012). Patient-reported measures of psychosocial issues and health behavior should be added to electronic health records. *Health Affairs (Millwood)*, *31*, 497-504.

Glasgow, R. E., & Linnan, L. A. (2008). Evaluation of theory-based interventions. In K. Glanz, B. K. Rimer & K. Viswanath (Eds.), *Health behavior and health education: Theory, research, and practice* (4th ed., pp. 487-508). San Francisco, CA: Jossey-Bass.

Glasgow, R. E., Magid, D. J., Beck, A., Ritzwoller, D., & Estabrooks, P. A. (2005). Practical clinical trials for translating research to practice: Design and measurement recommendations. *Medical Care*, *43*, 551-557.

Glasgow, R. E., & Riley, W. T. (in press). Pragmatic measures: What they are and why we need them. *American Journal of Preventive Medicine*.

Glasgow, R. E., & Steiner, J. F. (2012). Comparative effectiveness research to accelerate translation: Recommendations for an emerging field of science. In R. C. Brownson, G. Colditz & E. Proctor (Eds.), *Dissemination and implementation research in health: Translating science and practice* (pp. 72-93). New York, NY: Oxford University Press.

Green, L. W., & Glasgow, R. E. (2006). Evaluating the relevance, generalization, and applicability of research: Issues in external validity and translation methodology. *Evaluation and the Health Professions*, *29*, 126-153.

Harris, M. J. (2010). *Evaluating public and community health programs*. San Francisco, CA: Jossey Bass.

Institute of Medicine. (2011a). *Learning what works: Infrastructure required for comparative effectiveness research—Workshop summary*. Retrieved from http://www.iom.edu/Reports/2011/Learning-What-Works-Infrastructure-Required-for-Comparative-Effectiveness-Research.aspx (Released 7-25-11)

Institute of Medicine. (2011b). *Patients charting the course: Citizen engagement in the learning health system—Workshop summary* (Biomedical and Health Research, Health Care Workforce, Health Services, Coverage, and Access, Quality and Patient Safety, Public Health). Washington, DC: Author.

Institute of Medicine. (2012). *How far have we come in reducing health disparities? Progress since 2000—Workshop summary* (Workshop Summary: Select Populations and Health Disparities). Washington, DC: Author. Retrieved from http://www.iom.edu/Reports/2012/How-Far-Have-We-Come-in-Reducing-Health-Disparities.aspx

Jilcott, S., Ammerman, C., Sommers, J., & Glasgow, R. E. (2007). Applying the RE-AIM framework to assess the public health impact of policy change. *Annals of Behavioral Medicine*, *34*, 105-114.

Kessler, R. S., & Glasgow, R. E. (2011). A proposal to speed translation of healthcare research into practice: Dramatic change is needed. *American Journal of Preventive Medicine*, *40*, 637-644.

Kessler, R. S., Purcell, E. P., Glasgow, R. E., Klesges, L. M., Benkeser, R. M., & Peek, C. J. (2012). What does it mean to "Employ" the RE-AIM model? *Evaluation and the Health Professions*, *36*, 44-66.

Kiefe, C., & Allison, J. J. (2012). Electronic data methods (EDM) forum. *Medical Care, 50(*Suppl. i), 1-101.

King, D. K., Glasgow, R. E., & Leeman-Castillo, B. (2010). Reaiming RE-AIM: Using the model to plan, implement, and evaluate the effects of environmental change approaches to enhancing population health. *American Journal of Public Health*, *100*, 2076-2084.

Klesges, L. M., Estabrooks, P. A., Glasgow, R. E., & Dzewaltowski, D. (2005). Beginning with the application in mind: Designing and planning health behavior change interventions to enhance dissemination. *Annals of Behavioral Medicine*, 29, 66S-75S.

Kroenke, K., Spitzer, R. L., Williams, J. B., & Löwe, B. (2009). An ultra-brief screening scale for anxiety and depression: The PHQ-4. *Psychosomatics*, *50*, 613-621.

Luce, B. R., Drummond, M., Jönsson, B., Neumann, P. J., Schwartz, J. S., Siebert, U., Sullivan, S. D. (2010). EBM, HTA, and CER: Clearing the confusion. *Milbank Quarterly, 88(2)*, 256-276.

Mays, G. P., & Hogg, R. A. (2012). Expanding delivery system research in public health settings: Lessons from practice-based research networks. *Journal of Public Health Management Practice*, *18*, 485-498.

Nutting, P. A., Baier, M., Werner, J., Cutter, G., Reed, F. M., & Orzano, A. J. (1999). Practice patterns of family physicians in practice-based research networks: A report from ASPN. *Journal of the American Board of Family Practice*, *12*, 278-284.

Pawson, R., Greenhalgh, T., Harvey, G., & Walshe, K. (2005). Realist review: A new method of systematic review designed for complex policy interventions. *Journal of Health Services Research and Policy*, *10*, S21-S39.

Paxton, A. E., Strycker, L. A., Toobert, D. J., Ammerman, A. S., & Glasgow, R. E. (2011). Starting the conversation performance of a brief dietary assessment and intervention tool for health professionals. *American Journal of Preventive Medicine*, *40*, 67-71.

Pierce, C. P. (1935). *Collected papers of Charles Sanders Peirce, Volumes V and VI: Pragmatism and pragmaticism and scientific metaphysics*. Cambridge, MA: Harvard University Press.

Proctor, E., Silmere, H., Raghavan, R., Hovmand, P., Aarons, G., Bunger, A., & Hensley, M. (2011, March). Outcomes for implementation research: Conceptual distinctions, measurement challenges, and research agenda. *Administration and Policy in Mental Health*, *38*, 65-76.

Roth, A. J., Kornblith, A. B., Batel-Copel, L., Peabody, E., Scher, H. I., & Holland, J. C. (1998). Rapid screening for psychologic distress in men with prostate carcinoma: A pilot study. *Cancer*, *82*, 1904-1908.

Sallis, R. (2011). Developing healthcare systems to support exercise: Exercise as the fifth vital sign. *British Journal of Sports Medicine*, *45*, 473-474.

Selby, J. V., Beal, A. C., & Frank, L. (2012). The Patient-Centered Outcomes Research Institute (PCORI) national priorities for research and initial research agenda. *Journal of the American Medical Association*, *307*, 1583-1584.

Smith, P. C., Schmidt, S. M., Allensworth-Davies, D., & Saitz, R. (2009a). Primary care validation of a single-question alcohol screening test. *Journal of General Internal Medicine*, *24*, 783-788.

Smith, P. C., Schmidt, S. M., Allensworth-Davies, D., & Saitz, R. (2009b). A single-question screening test for drug use in primary care. *Archives of Internal Medicine*, *170*, 1156-1160.

Solberg, L. I., Glasgow, R. E., Unützer, J., Jaeckles, N., Oftedahl, G., & Beck, A. (2010, July). Partnership research: A practical trial design for evaluation of a natural experiment to improve depression care. *Medical Care*, *48*, 576-582.

Stange, K. C., Breslau, E. S., Dietrich, A. J., & Glasgow, R. E. (2012). State-of-the-art and future directions in multilevel interventions across the cancer control continuum. *Journal of the National Cancer Institute Monograph*, *44*, 20-31.

Stange, K. C., & Glasgow, R. E. (2012). Considering and reporting important contextual factors. In Agency for Health Care Research and Quality (Eds.), *Methods brief for the AHRQ initiative in patient-centered medical home (PCMH)*. Rockville, MD: Agency for Health Care Research and Quality.

Stange, K. C., Woolf, S. H., & Gjeltema, K. (2002). One minute for prevention: The power of leveraging to fulfill the promise of health behavior counseling. *American Journal of Preventive Medicine*, *22*, 320-323.

Starfield, B., Gervas, J., & Mangin, D. (2012, April). Clinical care and health disparities. *Annual Review of Public Health*, *33*, 89-106.

Tabak, R. G., Khoong, E. C., Chambers, D. A., & Brownson, R. C. (2012). Bridging research and practice: Models for dissemination and implementation research. *American Journal of Preventive Medicine*, *43*, 337-350.

Thorpe, K. E., Zwarenstein, M., Oxman, A. D., Treweek, S., Furberg, C. D., Altman, D. G., & Chalkidou, K. (2009). A pragmatic-explanatory continuum indicator summary (PRECIS): A tool to help trial designers. *Canadian Medical Association Journal*, *180*, E47-E57.

Toobert, D. J., Glasgow, R. E., Strycker, L. A., Barrera, M., Jr., & King, D. K. (2012). Adapting and RE-aiming a heart disease prevention program for older women with diabetes. *Translational Behavioral Medicine*, *2*, 180-187.

Tunis, S. R., Stryer, D. B., & Clancey, C. M. (2003). Practical clinical trials: Increasing the value of clinical research for decision making in clinical and health policy. *Journal of the American Medical Association*, *290*, 1624-1632.

Veney, J. E., & Kaluzny, A. D. (2005, January). *Evaluation and decision making for health services*. Chicago, IL: Health Administration Press.

Zwarenstein, M., & Treweek, S. (2009). What kind of randomised trials do patients and clinicians need? *Evidence Based Medicine*, *14*, 101-103.

Zwarenstein, M., Treweek, S., Gagnier, J. J., Altman, D. G., Tunis, S., & Haynes, B. Pragmatic Trials in Healthcare (Practihc) Group. (2008). Improving the reporting of pragmatic trials: An extension of the CONSORT statement. *British Medical Journal*, *337*, a2390. doi:10.1136/bmj.a2390