

From Research to "Best Practices" in Other Settings and Populations*

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Objective: To review the genesis and current status of "best practices" thinking, its application in health promotion practice, and in generalizing research to alternate populations, places and times. **Methods:** A presbyopic eye is cast over the recent evolution of the concept of "best practices" from medicine to public health. **Results:** Some discontinuities are found in the migration of this concept from medicine, where it ap-

plies with some consistency to the relatively homogeneous physiology of the human species, to health behavior where social, cultural, economic, and other heterogeneities make the generalizability of any research more suspect. **Conclusions:** Health promotion and other applications of health behavioral research need to replace "best practices" with "best processes."

Am J Health Behav 2001;25(3):165-178

Such a relaxed venue and flattering invitation as this tempts one to offer a somewhat autobiographical review of research and development as it might pertain to the topic at hand. "Best practices" and "health promotion" both came of age while I was in Canada during much of the 1990s. Both had an earlier history, but they hit their stride in that period. The Canadians contributed enormously—and are often credited with having given global leadership—to health promotion by conceptualizing it as more than risk-behavior change.¹ Canada has shown the

world, and its neighbors to the south in particular, that health promotion needs to be pursued not as a reductionist exercise in changing individual behavior, but as an empowering process of giving people and populations greater control over the determinants of their health. With "population health," Canada has led the way in casting the spotlight once again on the more distal, socioeconomic, and cultural "determinants of" (or at least influences on) health.

Meanwhile, the Americans have plodded on with prolific research and microanalyses of change in personal risks through the application of behavioral sciences theory and research. Such work in the United States accounts in substantial part for the dramatic public health success stories of the past 3 decades. Reductions in deaths due to cardiovascu-

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* Presented in part as the American Academy of Health Behavior Research Laureate Address, Santa Fe, NM, September 24, 2000, and at the Nordic Conference on Health Promotion Research, Tampere, Finland, September 8, 2000.

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lar disease, stroke, lung cancer in men, alcohol-related crashes reductions, and variety of associated morbidities can be attributed in some major degree to the application of rigorous behavioral research and planning methods to programs directed at supporting healthful behavior. These applications of *behavioral science* would not have happened without an infusion of *social sciences* from economics, sociology, political science, and community organization, giving the behavioral and health sciences a chance to be applied on a broader public health or population scale through advocacy, policy initiatives, organization, and regulation. Canadian and European colleagues have inspired some of this *social science* amplification of American behavioral science research in health.

The Problem of Disseminating and Applying "Best Practices"

Tonight I want to try to come to grips, or at least to grapple, with the challenges that stand between our past successes and our future achievement of outcomes consistent with the health promotion ideals expressed in the Ottawa Charter from the first International Conference on Health Promotion in 1986.² In particular, the Charter emphasized the need to empower people to take greater control of the determinants of their own health and to recognize that, for most people, health is not an end in itself, but a means to achieve other values in life. Many of those determinants and other values can only be known at a local or community level, even at an individual level, as they vary with many of the circumstances under which people live their daily lives. Similar ideals were articulated earlier in the United States' 1990 objectives for the nation in health promotion and disease preven-

tion,³ and increasingly in the 2000 and the 2010 objectives.⁴ Such ideals are also expressed in many of the principles and imperatives of health education underpinning health promotion in North America.⁵ The challenges I will offer concern the frustration we have all felt in attempting to reach large segments of the populations of the United States, Canada, and Europe despite the dramatic public health successes for which we can claim some credit.

The frustrations center on four gaps that we need to bridge:

- The gap between the efficacy of best practices as indicated by research and the effectiveness of these best practices when implemented in the field, especially when implemented to reach underserved populations.
- The gap between best practices-based research and the most appropriate adaptation of those best practices for the target population.
- The gap between our successes in achieving individual behavior change among the affluent and educated segments of the population and lesser success in reaching less affluent, less educated, and more socially isolated segments of the population.
- The gap between the role of university-centered, investigator-controlled research and the role that local practitioners, community groups, agencies, and governments need to play to ensure that future research is relevant and useful to local needs.

It would be too easy to offer the pat formulas of diffusion theory and dissemination research to address most of these challenges. Clearly, the failure of adequate diffusion and dissemination accurately describes the problems underlying most of these challenges, but diffusion theory and dissemination methods do not in themselves offer complete solutions. Based on a line of work on diffusion stretching from Berkeley⁶ to Bangladesh,⁷ Baltimore⁸ to Washington⁹ and Boston,¹⁰ Geneva¹¹ to Houston^{12,13} to Vancouver¹⁴ to Atlanta, I have to conclude that diffusion and dissemination of information is no longer the problem it once might have been in causing disparities in action. Clearly the information technologies now at our disposal make access to informa-

tion a vanishing or at least changing problem. As John Nesbitt said, "We are drowning in information, but starved for knowledge."¹⁵ Guy Parcel and his colleagues, for example, demonstrated clearly that getting information and even packaged curricula and program ideas to the schools was not the problem; it was implementation by administrators and teachers that prevented the information and other effective program components from reaching and influencing students.¹⁶ By some definitions, implementation is part of dissemination, but most distinguish "diffusion and adoption" as separate and discontinuous processes and stages.

Nor can I comfortably suggest reviving the other cognitive emphases of past approaches to bridging the knowledge and behavior gap for whole population segments who have seemed "hard to reach," such as attempting to change attitudes or beliefs. I argued against the emphasis on attitude change in one of my earliest papers in 1970.¹⁷ Our meta-analytic review 18 years later at the University of Texas on applications of the Health Belief Model with adults found the evidence still lacking for the model's consistency of validation.¹⁸ Again, I would not conclude that the model is wrong, as far as it goes. The slice of reality it analyzes, however, is of less importance as we move outward from the more affluent, educated, and health-motivated segments of the population to those less affluent, less educated, and less motivated by health concerns or by knowledge, and more constrained by resources available to them.

"Best practices" also must be something more than:

- Hard-nosed, trial-and-error, outcome-only studies with their misplaced precision and theory-starved interventions.
- Fuzzy systems research with immediate-only or intermediate-only variables that are not clearly linked from previous research to health outcomes.
- Investigator-centered studies in unrepresentative populations.

These and the related problems of applying research from particular studies in particular populations to the "best practices" recommended to administrators and practitioners working in other popu-

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lations are the focus of this paper.

The Origins and Sources of "Best Practices" Thinking

Where did the field get the idea that evidence of an intervention's efficacy from carefully controlled trials could be generalized as the "best practice" for widely varied populations and situations? This assumption has been inherent from the beginning of research and evaluation in every field of engineering and human service. It is straightforward enough to appreciate how the laws of physics and material sciences can be counted on to apply consistently across applications of the same materials in different manufacturing or engineering situations. Among the fields that intervene on living organisms, it has served medicine and agriculture especially well. These fields have the advantage over most human service professions in the homogeneity of the biological specimens they intervene upon. The human organism on which medicine intervenes and the farm plants or animals on which agriculture conducts experiments are relatively consistent in their essential characteristics. A medical intervention can be counted on to have a similar efficacy on the human organism across the human species, with minor adjustments of dosage by age and sex, regardless of culture, socioeconomic condition, or historical precedent in social customs, laws, and policies.

The social and behavioral aspects of human services, on the other hand, must make infinitely more adjustments of their interventions, not just in their dosage. They must adjust their content and dos-

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age, not only by age and sex as in medicine, but also according to the social and cultural, economic and occupational circumstances of the individual. These variations are compounded in public health or population interventions in which the individual, group, and organizational variations multiply in their various combinations within populations.

Landmark Applications of Best Practices in Health Promotion and Public Health

Clinical preventive services. The Canadian Task Force on the Periodic Health Examination broke new ground in 1976 by developing and applying a set of criteria and ratings of evidence to recommend best practices for each of a wide range of preventive maneuvers in medicine.¹⁹ The U.S. Preventive Services Task Force (USPSTF)²⁰ followed the Canadian lead in 1984 with the application of the same criteria and ratings of evidence. They differed little on their conclusions and recommendations, with a notable exception in the age at which they recommended mammograms. But the USPSTF differed even from the US National Cancer Institute on this recommendation. Serving as a member of the USPSTF was my first immersion in the questions that can be raised about "best practices" by different scientific reviewers of the same evidence, using the same criteria and ratings of evidence.

The methods and spirit of these expert assessments of evidence drew heavily on the systematic, evidence-based reviews of medical research developed by Archie Cochrane and his colleagues in England and David Sackett and Brian Haynes in Canada. Sackett and Haynes applied this

approach to the health behavior overlap with medicine in their landmark compilation of reviews of *Compliance in Health Care*²¹ and more recently in a book for clinicians on how to apply and teach evidence-based medicine.²² Haynes has gone on to establish and edit the journal; *Evidence-Based Medicine*. As a participant in their conference at McMaster University to debate the compliance reviews of the late 1970s, I found myself very much on the defensive in holding out some hope for patient education in the face of their systematic reviews showing limited effectiveness of these interventions. Conclusions of limited effectiveness, I believed, were mostly Type II errors of inadequate measurement, but could also have reflected Type III errors by which interventions may not have been properly implemented. The cumulative research since that time has vindicated patient education and counseling interventions, which has left me with a further skepticism about the wisdom of withholding interventions on the basis of negative findings from systematic reviews. To err on the false-negative side of withholding logically sensible and theoretically defensible treatments because of inadequate randomized controlled trials evidence of their effectiveness, especially in areas such as patient education where the paucity of evidence was largely a function of poor research support, seemed an unwise use of "best practices."

This is not to argue against the need for systematic reviews, nor to suggest that the systematic reviews have failed in their purpose, but only to acknowledge the limitations of systematic reviews when the research is underdeveloped, inadequate, or incomplete.

From clinical to community levels of intervention. The latest (February 2000) upstart in this tradition of systematic, collaborative reviews of research to produce evidence-based recommendations for practice is the Campbell Collaboration, named after American psychologist and evaluation guru Donald Campbell. This collaboration is significant for health behavior and health promotion because it seeks to prepare and promote access to systematic reviews of studies on the effects of social and educational policies and practices outside medical care settings, as in much of the research on mental health and substance use.

Cochrane and Campbell systematic reviews are published electronically so that they can be updated promptly as relevant additional evidence emerges. They are amended periodically in the light of criticisms and advances in methodology. The nine key principles on which the work of both collaborations are based are

- Collaboration, by internally and externally fostering good communications, open decision making, and teamwork.
- Building on the enthusiasm of individuals, by involving and supporting people of different skills and backgrounds.
- Avoiding unnecessary duplication, by good management and coordination to ensure economy of the effort.
- Minimizing bias, through a variety of approaches such as abiding by high standards of scientific evidence, ensuring broad participation, and avoiding conflicts of interest.
- Keeping up to date, by a commitment to ensure that reviews are updated through identification and incorporation of new evidence.
- Striving for relevance, by promoting the assessment of policies and practices using outcomes that matter to people.
- Promoting access, by widely disseminating the outputs of the collaboration, taking advantage of strategic alliances, and promoting appropriate prices, content and media to meet the needs of users worldwide.
- Ensuring quality, by being open and responsive to criticism, applying advances in methodology, and developing systems for quality improvement.
- Continuity, by ensuring that responsibility for reviews, editorial processes, and key functions is maintained and renewed. (see www.cochrane.org; and <http://campbell.gse.upenn.edu>)

Because of their mutual concern about the quality of evidence and because the science of research synthesis is still young, the Campbell and Cochrane Collaborations have established joint Cochrane-Campbell Methods Groups. These groups seek to stimulate the empirical methodological research required to improve the validity, relevance, and precision of systematic reviews and the

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randomized trials and other studies on which they are based.²³ For Cochrane the emphasis on randomized trials would have been a natural extension of his work; but for Campbell, the inclusion of other studies in the mix would have suited his late career emphasis. Maintaining in one of his latest articles that there exists a complex social system of diagnosis and delivery in the context of preventive interventions, Campbell argued against testing only "theoretically pure variables in isolation or in experimentally controlled higher-order interaction" (p 416).²⁴ Campbell (1987) noted further that

*We applied social scientists need not only randomized experiments and quasi experiments, but also case studies, ethnography, participant observation, gossip collection from informants, hermeneutics, and so on ... ideally [to be] used as a supplement to experimentation, but if need be they may be used alone ... not because the social sciences seek a different kind of validity than do other sciences, but rather because to stay with our problems, we must use techniques which, while improving the validity of our research, nonetheless provide less clarity of causal inference than would a retreat to narrowly specified variables under laboratory control" (p 417, original emphasis).**

The Centers for Disease Control and Prevention (CDC) has now organized a

* I am indebted to Mark Daniel for pointing out quotations from Campbell's 1987 article. See Daniel M. Effectiveness of community-based diabetes prevention and control in a rural aboriginal population. Vancouver; Unpublished dissertation, Department of Health Care and Epidemiology, University of British Columbia, 1997.

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national committee to produce a set of community preventive services guidelines²⁵ that would be parallel to the clinical preventive services guidelines. Systematic reviews of evidence are under way in various areas of population and public health interventions.²⁶

Alternatives to strict evidence-based interpretations. Alternatives to the slavish dependence on often-inadequate evidence because of insufficient funding and underdeveloped methodologies are the rule rather than the exception. Most are variations on the "consensus conference" approach of NIH and the expert committee and "witness" approaches of bodies such as the World Health Organization, the National Academy of Sciences, the Royal Society of Canada, royal commission studies, or reports for the European Commission.²⁷ These approaches acknowledge that the evidence for interventions in policy-relevant research on health is bound to leave gaps and present conflicting findings. They assume that the gaps, conflicting evidence, and data subject to alternative interpretations can be reconciled best through an expert consensus-development process in which the combined experience of leading researchers and practitioners or policy makers in grappling with the evidence and the problem or issue can be brought to bear.²⁸ Having served on a few of these types of committees for the NIH and the National Academy of Sciences in the United States and the Royal Society in Canada, I believe that this consensus approach to evidence balances inadequate data with informed human judgment. As with the Canadian and U.S. task forces on clinical preven-

tive medicine, however, their consensus processes are susceptible to group dynamics, scientific norms, beliefs about disciplinary and methodologic superiority, and other socio-historical and epistemological influences.²⁹

CDC initiated another landmark approach in "best practices" with the analysis of states as laboratories of social experiments in disease control and health promotion. Having as many as 50 states does, at least, provide a statistical sampling advantage over many nations for ecological analyses, if not as "laboratories for democracy." Staff of CDC's Office on Smoking and Health (OSH) fielded a mounting demand for technical assistance on tobacco control as many of the states faced high-stake decisions on how to allocate the large sums of litigated damages to be paid by the tobacco industry to the states. OSH reviewed the evidence of success and the common characteristics of policies and programs in three states and codified their commonalities as *Best Practices for Comprehensive Tobacco Control Programs* to recommend to other states.³⁰ California and Massachusetts had established the earliest comprehensive programs of tobacco control.^{31,32} These 2 states had achieved, respectively, a doubling and tripling of the rates of decline in smoking prevalence in the other 48 states. A third state, Oregon, came up fast behind them with similarly impressive results compared with other states having less comprehensive efforts.³³ The comprehensive efforts of these states combined taxation, mass media counter-advertising, cessation programs, local and state ordinances for smoke-free environments, restricted access by minors, and community-based programs for prevention, including enforcement of the ordinances. This policy and program analysis alternative to systematic reviews of experimental studies to derive "best practices" for government policy and program decisions lent a practical and helpful guide that many states have applied as they scurry to justify their share of the tobacco settlement funds. Whether the guidelines would have been so eagerly consumed under fewer pressures and lower stakes can only be conjectured. We know that other states ask with increasing frequency and skepticism about the applicability of the California, Massachusetts, and Oregon experiences to their

own situations.

The National Center for Chronic Disease Prevention and Health Promotion at CDC is now developing a set of "best practices" that would apply to other areas of chronic disease control and health promotion. Whether to use the methods of systematic review of smaller-scaled, but more controlled studies, or the OSH method of larger-scaled natural quasi-experiments provided by model state examples of comprehensive programs and policies, has not been decided. OSH, meanwhile, seeks to take its analysis down to the community level to develop "best practices" guidelines for local tobacco control efforts.

Several of these landmarks in North America hold significance because of their government auspices and the prospect of policy application that follows from those auspices. For example, the U.S. Preventive Services Task Force guidelines in their second edition³⁴ have the potential of influencing the selection of practices eligible for reimbursement under Medicare or Medicaid, or provincial health plans in the case of the Canadian Task Force on the Periodic Health Examination. The CDC-sponsored community preventive services guidelines have the potential of becoming a guide to preventive block grants to states and other policy, planning, funding, and implementing functions at the state and local levels.³⁵ These potentials for influencing the environments for better preventive and health promotion practices of professionals are greater than the potential of influencing "best practices" through the publication of systematic reviews of controlled studies that would presumably affect the attitudes and behavior of practitioners.³⁶ The latter suffer from various communications gaps between research and practice:

- An accessibility gap (Do I have the same resources as the experimenters?).
- A credibility gap (How different is their situation of practice from mine?).
- An expectations gap (Is it really necessary for me to strive for such lofty goals in my practice?).³⁷

Numerous suggestions besides "best practices" have been offered and solicited in the editorials of leading journals for bridging the research-practice divide.³⁸⁻³⁹

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"Best practices," however, will retain their luster as the gold standard to which every practitioner should aspire, and as elusive, imaginary pots of gold at the end of research rainbows, so long as we fail to recognize the inherent limitations in the concept and in the execution of the concept.

Problems Inherent in "Best Practices" Recommendations from Research

Internal validity supreme over external validity. As scientific reviewers cast their critical eyes on the evidence of intervention effectiveness from research studies, they naturally give most of their attention to the quality and execution of the experimental or quasi-experimental design in controlling for confounding factors. They are vigilant in guarding against what Donald Campbell and Julian Stanley called, in their classic work on experimental and quasi-experimental designs, "threats to internal validity."⁴⁰ These are the prerequisites to attributing to the interventions whatever changes in outcomes are observed. It is perfectly understandable that these concerns would take precedence over external validity. Without internal validity, one cannot expect to have external validity—the degree to which the findings can be generalized to other settings or populations. My concern here is that the preoccupation with internal validity has so overshadowed the questions of external validity that the latter get little attention in the final recommendation of "best practices."

The ratings of evidence used by the Canadian and U.S. task forces on clinical preventive services, for example, took

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some pains to note the considerable variations in the application of their guidelines for some interventions across age-groups or stages of life and, of course, between sexes. They also note the medical contraindications for some procedures. Beyond these broad refinements, however, they devote little space to the need for tailoring or individualizing their recommended interventions to the patient. The U.S. Preventive Services Task Force gave far more attention than the Canadian Task Force to the importance of patient education and counseling. Indeed, over half of the recommendations in the first edition of the U.S. clinical guidelines were for counseling interventions. This attests to the recognition that, without more fine-tuned evidence on external validity, people would need to adapt their personal implementation of the recommendations to their own circumstances and lifestyle.

The CDC Office on Smoking and Health's *Best Practices for Comprehensive Tobacco Control Programs*³⁰ had only three states with enough program and outcome data from which to generalize its recommendations to the other 47 states when it was first prepared. Other states, including Arizona and Florida, have now amassed sufficient evidence of the effects of these "best practices" to allow for an expansion of the recommendations and greater confidence in generalizing to other states. The criteria used in admitting the first three states to the analysis had everything to do with the perceived methodological quality of their programs and their data and little to do with their representativeness. In short, internal validity was supreme over external validity in drawing the conclusions for "best practices."

In the case of the CDC-sponsored *Guide to Community Preventive Services*,²⁵ the methods, criteria, and rating scales for evidence, once again, place virtually all the weight on internal validity. Ratings for "suitability of study design for assessing effectiveness" and "assessing the strength of a body of evidence on effectiveness of population-based interventions" both show a direct and exclusive relationship to the strength of recommendations. To their credit, this Task Force does have a set of procedures for considering external validity or "applicability" to local situations, although they do not show up in the ratings that lead to recommendations. These provide that chapter development teams:

(1) define target populations and settings for which the intervention might be considered; (2) assess whether available studies have evaluated the intervention in those populations and settings; (3) assess the extent to which the populations or settings in those studies are likely to represent the target populations and settings of interest; and (4) make judgments about whether the intervention works better or worse in some populations and settings than in others. Based on that information, the Task Force will make a judgment about how widely the resulting recommendations should apply as well as identifying areas for further research (p.34).³¹

Human organisms' homogeneity vs social organizations' heterogeneity. The relative predictability of the human organism's response to medical or surgical interventions compared with the relative unpredictability of social and psychological factors that might modify the response to health promotion or public health interventions make the "evidence-based best practices" exercise qualitatively different. The medical origins noted earlier for "best practices" in the health fields make these differences worthy of careful consideration in adopting the methods of systematic review and synthesis of evidence. The emphasis on internal validity can be more readily justified in the medical sciences where the applicability of an intervention to other human bodies can be claimed with greater confidence. Procedures such as those just quoted from

the Community Preventive Services Task Force will result in more evidence having to be set aside or applied cautiously in communities and populations.

Internal validity maximizes attributability of outcomes to the interventions intended to affect them. External validity maximizes relevance of the results to other settings or populations. I will come to an alternative approach to maximizing relevance while achieving an acceptable level of internal validity in the later section on participatory research.

Historical, legal, and other contextual factors in health promotion. Besides homogeneity vs heterogeneity of the recipients of interventions, the uniformity or variability of the interventions also relates to the context in which the interventions must be developed and applied. Clinical interventions are typically implemented in clinical settings, with considerable control over the context and circumstances. Clinical trials establishing efficacy, however, do not always translate to establishing effectiveness in real-world settings. For example, an efficacious drug may be ineffective if people will not take it as prescribed. In terms of effectiveness, then, clinical interventions, along with health promotion and other social and behavioral sciences involved in public health, cannot fail to account for and adapt to the historical, legal, political, economic, social-organizational, and cultural aspects of a community or population. In meeting this need, health promotion interventions can take either a centrally planned, outcome-focused, evidence-based approach to doing so,⁴² or they can engage the community in a responsive or reactive mode to adapt the program to the participatory input of local practitioners and residents.⁴³ The problems of "best practices" arise largely when the recommended or required best practice (usually tested in one or more particular localities) is imposed as policy from central authority upon the highly variable other settings in which they may not fit the particular circumstances.⁴⁴

One further aspect of history is that communities and populations change from day to day. Even if one tries to generalize today's research to the same community or population, much less another population, the population might have changed enough in the time since the research was completed (perhaps even

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before it is published) that the results no longer apply to that population.

**Alternatives to, or Variations on,
"Best Practices"**

Expectations that health promotion and health behavior research will produce "best practices" as interventions in the same way as medical research has done in efficacy trials must be replaced with something akin to "best practices for the process of planning for most appropriate interventions for the setting and population." We should not expect to be exempted from the evidence-based requirements now imposed on other fields of health practice, but the evidence brought to bear should be tested methods of intervention combined with procedures and theories to achieve the appropriate fit between the possible methods and the targeted population's circumstances. Some alternatives follow.

"Best Practice" as process rather than as packaged interventions. A common misunderstanding about health promotion research is that it seeks or should seek a magic bullet, a package to put on a shelf in any community where professionals can pull it off and apply it. I have never believed that was going to be possible and said as much in the early formulation of the Precede model of health education planning⁴⁵ and in later extensions of the model to encompass health promotion's policy, organizational, and regulatory aspects.⁴⁶ Yet, because generalizability or external validity is one of the criteria of good science, we are at risk of undermining confidence in health promotion if we make too much of a point that our research cannot be expected to produce highly generalizable findings. What needs to be clarified is that health promotion research can promise to produce a generalizable *process for planning*, not a generalizable *plan*. The products of

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health promotion research that will have generalizability are ways of engaging the community, ways of assessing the needs and circumstances of the community or population, ways of assessing resources, ways of planning programs, and ways of matching needs, resources, and circumstances with appropriate interventions. It is the science of diagnosis—building a better understanding of what practitioners and policy makers need to look for and find in communities, in populations, and organizations—that should be developed and applied as the first level of "best practice" for health promotion and population health programs. A necessary second level is matching community capacity and needs with appropriate processes for implementation of meaningful interventions responding to local needs.

Emphasize control by practitioner, patient, client, community, or population. Central to the Ottawa Charter definition of health promotion was "enabling people to control their health." This alone would imply that "best practices" would emphasize a process of enabling people to command their own unique or tailored interventions to fit their own perceptions of need and their own circumstances, and to develop their own capabilities. Penny Hawe and her associates in Australia developed a practitioner's guide to planning and evaluation through an iterative, 3-year interaction with practitioners to blend evidence-based planning models with *their* culture and experience.⁴⁷ Much has been written in recent years on participatory research to enable local populations or communities to play a more active role in framing the research questions, proposing acceptable methods of data collection, and interpreting the results in ways that will have more relevance for local action.⁴⁸ More remains to be done in making these methods of participatory research workable within the peer review and grant-making procedures

of funding agencies.⁴⁹

Besides making the research more participatory, the study of implementation of policy and program guidelines has shown that greater discretion in the hands of local planners and practitioners to adapt the policies and guidelines to their circumstances will enhance effective implementation.⁵⁰ Greater local discretion and flexibility will only intensify the need for ongoing formative and process evaluation to ensure appropriate uptake, implementation, and penetration of interventions.

Emphasize local evaluation and self-monitoring. Hawe's work, the Precede-Proceed Model, and other health promotion planning models reflect the growing understanding that a sound approach to best practice in any local situation is one that emphasizes evaluation. The best monitoring of "best practice" is self-monitoring by those closest to the practice—those who are in the best position to adjust the practice according to the monitoring and evaluation results. Rather than "viewing" the distant evaluation of another program in another population as definitive of best practice, local workers should view such evaluations as suggestive of a hypothesis to be tested, with appropriate adaptation, in the local situation.

More systematic study of place, setting, and culture. If it is correct that best practice in health promotion must, above all, take context into account, then more systematic study of place, organizational settings, social circumstances, and culture must be a part of the research agenda to guide health promotion practice.⁵¹ An ecological approach to health promotion would take the environment and its reciprocal relationship to behavior into account as grounding for planning and "best practice."⁵² We should draw more systematically on geography and anthropology among the social sciences to which we turn for theory and data.

Research on the tailoring process and new technologies. A recent flourishing of studies around issues of health education technology—namely information, communication, and computing technologies—provides hope that we can ultimately tailor health communications to the needs of each person, acknowledging that nothing is generalizable to everybody. We have despaired in the past of having the prin-

ciple of individuality applied within a population approach. Mass media, for example, necessarily have mass messages. The new technologies offer the possibility of manipulating those messages, varying them systematically to fit the characteristics, needs, tastes, and values of different populations.⁵³⁻⁵⁵

At least 3 types of products seem to be emerging that I think will afford a whole new generation of research in health promotion. One of these is Expert System Software. It compiles the evidence and best practices in such a way that entry-level practitioners can put a CD-ROM in their computers and get clear guidance on how to proceed in a way that is more usable and adaptable than what they find in a textbook or manual. We tried to develop one such software, called EMPOWER for "Expert Methods of Planning and Organizing Within Everyone's Reach."⁵⁶ This first attempt was too crude to work smoothly in the daily, myriad routines of practitioners,⁵⁷⁻⁵⁸ so we converted it from a planning tool to a teaching tool, which has been well received in the classroom as an adjunct to the Precede-Proceed textbook.⁵⁹ Nevertheless, I remain convinced that expert system software has a future for field-tested guidance of practitioners in real time, on the job, in planning programs, and some people in health promotion are pursuing this vision.⁶⁰

A second head-turning function of new information technologies that addresses a source of the stress professionals are experiencing is the information retrieval function. With an agile wrist on the mouse, we are now able to gather information from just about anywhere in the world. Three years ago people were asking me for documents. Now they ask for Web sites and URL addresses. Practitioners can no longer excuse themselves from the research review and local data compilation tasks that the more thorough planning models demand. The information retrieval capabilities of most computer connections now put instant research literature and instant local data on the desktop of the practitioner. The challenge is to train practitioners to be able to bridge the gap between the research done elsewhere and the circumstances of their communities.

Possibilities of synthesizing research from sources other than randomized

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trials. Having new software packages for qualitative research as well as for research synthesis, we look ahead to the possibility for systematic syntheses of qualitative and quantitative research. When we are eventually in the position to synthesize qualitative and quantitative research from various settings, we will be on a new exciting frontier of knowledge application.

Our use of information technology and the synthesis of evidence from scientific sources will have to be different from other fields because of the greater importance of context in health promotion. Everything we do needs to be contextualized. We need information systems not only to synthesize the scientific information about the strength of relationships between independent and dependent variables, inputs and outcomes, but also to blend that with information about the people studied and how they differ from the local people and the local community's characteristics. We need to consider within-study individual and group differences, rather than try to nullify them through processes of randomization to groups.

How can we use this new technology to tap into community information systems and population information systems for health promotion planning? We need to combine health promotion research information, census, vital statistics, opinion polls and surveys, content analyses of media coverage of health topics, and even case studies and journalistic descriptions so that we can match the evidence from scientific sources with the evidence from the community.

Much of this will be made more relevant, more usable, and more likely to be used if we can develop and apply it in

participatory ways with communities and populations. Participatory research should be one of the hallmarks of health promotion research in the future. If it was once avoided because it was too messy, the new information technologies and communication tools might make it less so.

SUMMARY AND CONCLUSION

Faced with the demand for evidence-based practice on one side and the supply of idiosyncratic sources of evidence on the other, health promotion practitioners, planners, and policy makers have had to adapt the evidence to their regional, local, or organizational circumstances on the fly. With professional judgment and community input, most local programs have made good use of evidence when it seemed relevant, but more often ignored it because it felt foreign. The foreign feel of the evidence stems from its unrepresentative sources, either in the artificiality of the circumstances of the research or in the socioeconomic character of the subjects or the setting. The CDC-derived "best practices" for tobacco control, for example, came in the first edition from the states of California, Massachusetts, and Oregon. Other states have had difficulty identifying with those three states, their populations, and the circumstances under which they were able to mount their programs in tobacco control.

Such misfitting of evidence and practice is pervasive and probably inherent in health promotion. Even if the number of settings in which the research could be replicated were multiplied by the number of states, provinces, or countries in which it might be applied, the changing political, economic, and other time-dependent circumstances between the research and the application in practice might make the research suspect.

These observations need not lead us to a nihilistic or postpositivist position of dismissing all evidence that is not local and immediate. I have suggested at least 6 ways to cope with these problems of practice adapting to evidence or adapting evidence to practice. Each has precedents in practice and some lines of development in social, behavioral and health promotion research. These suggestions are entirely consistent with the philosophies and tenets underpinning health promotion practice, and each warrants a

research agenda of its own.

ACKNOWLEDGMENTS

I am grateful to Mark Daniel and Shawna L. Mercer for helpful comments on an earlier draft of this paper. ■

REFERENCES

1. Pederson A, Rootman I, O'Neill M, (Eds.). Health Promotion in Canada. [Toronto]: W.B. Saunders, 1994.
2. First International Conference on Health Promotion. The Ottawa Charter for Health Promotion. Health Promotion 1986;1(4):iii-v.
3. Public Health Service. Promoting Health/Preventing Disease: Objectives for the Nation. Washington, DC: US Department of Health and Human Services, 1980.
4. U.S. Department of Health and Human Services (HHS) Healthy People 2010 (Conference edition in two volumes). Washington, DC: HHS, 2000.
5. Green LW, Frankish CJ. Health promotion, health education, and disease prevention. In CE Koop, CE Pearson, MR Schwarz, (ed), Critical Issues in Global Health San Francisco: Jossey-Bass 2000;321-330.
6. Green LW. Identifying and overcoming barriers to the diffusion of knowledge about family planning. *Advances in Fertility Control* 1970;5:21-29.
7. Green LW, Gustafson HG, Griffiths W, Yaukey D. The Dacca Family Planning Experiment. Berkeley: University of California Public Health Education Monograph No. 1, 1970.
8. Green LW. Diffusion and adoption of innovations related to cardiovascular risk behavior in the public. In Enelow AJ, Henderson JB (Eds.), *Applying Behavioral Science to Cardiovascular Risk*. New York: American Heart Association, 1975:84-108 [Reprinted in Congressional Record, Hearings of the Senate Subcommittee on Health, May 7-8, 1975:980-1040].
9. Green LW, McGinnis M, Phillips TS, Devereaux M, Montes H. Strategies for Promoting Health for Specific Populations. Washington, DC: U.S. Office of Health Information and Health Promotion, DHHS, 1981 (PHS) Publication No. 81-50169. Reprinted in *J Public Health Policy* 1987;8(3):369-423.
10. Green LW, Lewis FM. Issues in relating evaluation to theory, policy and practice in continuing education and health education. *Mobius* 1981;1:46-58.
11. Green LW. New policies in education for health. *World Health* 1983 (April-May):13-17.
12. Green LW, Gottlieb NH, Parcel GS. Diffusion theory extended and applied. *Advances in Health Education and Promotion* vol. 3. London: Jessica Kingsley, 1991;91-117.
13. Parcel GS, Eriksen MP, Lovato CY, Gottlieb NH, Brink SG, et al. The diffusion of school-based tobacco-use prevention programs: project description and baseline data. *Health Educa-*

- tion Research 1989;4(1):111-124.
14. 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 1):S11-S15.
 15. Nesbitt J. Megatrends. New York: Harper & Row, 1990.
 16. Parcel GS, O'Hara-Tompkins NM, Harnist RB, Basen-Enquist KM, McCormick LK, et al. Diffusion of an effective tobacco prevention program. Part II: evaluation of the adoption phase. *Health Education Research* 1995;10:297-307.
 17. Green LW. Should health education abandon attitude-change strategies: perspectives from recent research. *Health Education Monographs* 1970;1:24-48.
 18. Harrison JA, Mullen PD, Green LW. A meta-analysis of studies of the Health Belief Model. *Health Education Research* 1992;7(1):107-116.
 19. Canadian Task Force on the Periodic Health Examination. The periodic health examination. *Can Med Assoc J* 1979;121:1193-1254.
 20. US Preventive Services Task Force. Guide to Clinical Preventive Services: An Assessment of the Effectiveness of 169 Interventions. Baltimore: William & Wilkins, 1989.
 21. Haynes RB, Taylor DW, Sackett DL, (Eds.), Compliance in Health Care. Baltimore: Johns Hopkins University Press, 1979.
 22. Sackett DL, Richardson S, Rosenberg W, Haynes RB. Evidence-based Medicine: How to Practice and Teach EBM. London; Churchill Livingstone, 1997.
 23. Jadad AR, Cook DJ, Moher D. Methodology and reports of systematic reviews and meta-analyses: a comparison of Cochrane reviews with articles published in paper-based journals. *JAMA* 1998;280:278-279.
 24. Campbell DT. Guidelines for monitoring the scientific competence of prevention intervention research centers: an exercise in the sociology of scientific validity. *Knowledge: Creation, Diffusion, Utilization* 1987;8:389-430.
 25. Truman BI, Smith-Akin CK, Hinman AR, Gebbie M, Brownson R. Developing the Guide to Community Preventive Services—overview and rationale. *Am J Prev Med* 2000;18(Suppl 1):18-26.
 26. Zaza S, Lawrence RS, Mahan CS, Fullilove M, Fleming D. Scope and organization of the Guide to Community Preventive Services. *Am J Prev Med* 2000;18(Suppl 1):27-34.
 27. International Union for Health Promotion and Education. The Evidence of Health Promotion Effectiveness: Shaping Public Health in a New Europe. Brussels: European Commission, 1999.
 28. Tones K. Beyond the randomised controlled trial: a case for 'judicial review.' *Health Education Review* 1996;12(2):1-4.
 29. Daniel M, Green LW, Sheps SB. Paradigm change and uncertainty about funding of public health research: social and scientific implications. *Journal of Health and Social Policy* 1998;10(2):39-56.
 30. Pechacek TF, Starr GB, Judd BT, Selin HJ, Fishman JA, et al. *Best Practices for Comprehensive Tobacco Control Programs*, August 1999. Atlanta, GA:1999.
 31. California Department of Health Services. A Model for Change: The California Experience in Tobacco Control. Sacramento: California Department of Health Services, 1998.
 32. Abt Associates. Independent Evaluation of the Massachusetts Tobacco Control Program: Third Annual Report, January 1994-June 1996. Cambridge, MA: Abt Associates, 1996.
 33. Centers for Disease Control and Prevention. Decline in cigarette consumption following implementation of a comprehensive tobacco prevention and education program—Oregon, 1996-1998. *MMWR Morb Mortal Wkly Rep* 1999;48:140-143.
 34. U.S. Preventive Services Task Force. Guide to Clinical Preventive Services. 2nd ed. Baltimore: Williams and Wilkins, 1996.
 35. Atkins D, DiGiuseppe CG. Broadening the evidence base for evidence-based guidelines: a research agenda based on the work of the U.S. Preventive Services Task Force. *Am J Prev Med* 1998;14(Suppl 4):335-344.
 36. Solberg LI, Brekke ML, Kottke TE. How important are clinician and nurse attitudes to the delivery of clinical preventive services? *J Family Pract* 1997;44:451-461.
 37. Lancaster B. Closing the gap between research and practice. *Health Educ Q* 1992;19:408-411.
 38. Schwartz R, Goodman RM. Health promotion practice: advancing the state of health promotion and education practice. *Health Promotion and Practice* 2000;1:5-9.
 39. McLeroy K. Health education research, theory and practice: future directions. *Health Education Research* 1992;7:1-8.
 40. Campbell DT, Stanley JC. *Experimental and Quasi-Experimental Designs for Research*. Chicago: Rand McNally, 1963.
 41. Briss PA, Zaza S, Pappaioanou M, Fielding J, Wright-De Agüero L. Developing an evidence-based Guide to Community Preventive Services—Methods. *Am J Prev Med* 2000;18(Suppl 1):35-43.
 42. Nutbeam D. Achieving "best practice" in health promotion: improving the fit between research and practice. *Health Education Research* 1996;11:317-326.
 43. Nutbeam D. Improving the fit between research and practice in health promotion: overcoming structural barriers. *Can J Public Health* 1996;87(Suppl 2):18-23.
 44. Hubbard L, Ottoson JM. When a bottom-up innovation meets itself as a top-down policy. *Science Communication* 1997;19:41-55.
 45. Green LW. Toward cost-benefit evaluations of health education: some concepts, methods and examples. *Health Education Monograph* 1974;2(Suppl 2):34-64.

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46. Green LW, Kreuter MW. Health Promotion Planning: An Educational and Ecological Approach. 3rd ed. Mountain View, CA: Mayfield Publishing, 1999.
47. Hawe P, Degeling D, Hall J. Evaluating Health Promotion: A Health Worker's Guide. Sydney, Australia: McLennan and Petty, 1990.
48. George MA, Green LW, Daniel M. Evolution and implications of participatory action research for public health. *Promotion and Education* 1997;3(4):6-10.
49. George MA, Daniel M, Green LW. Appraising and funding participatory research in health promotion. *International Quarterly of Community Health Education* 1998-99;18(2):181-197.
50. Ottoson JM, Green LW. Reconciling concept and context: a theory of implementation. *Advocates in Health Education and Promotion* 1987;2:353-382.
51. Poland BD, Green LW, Rootman I. Settings for Health Promotion: Linking Theory and Practice. Thousand Oaks, CA: Sage Publications, 2000.
52. Stokols D. Translating social ecological theory into guidelines for community health promotion. *Am J Health Promot* 1996;10:282-298.
53. Rimer BK, Orleans CT, Fleisher L, Cristinzo S, Resch N, et al. Does tailoring matter? the impact of a tailored guide on ratings and short-term smoking-related outcomes for older smokers. *Health Education Research* 1994;9:69-84.
54. Skinner CS, Strecher VJ, Hospers H. Physician recommendations for mammography: do tailored messages make a difference? *Am J Public Health* 1994;84:783-787.
55. Kreuter MW, Vehige E, McGuire AG. Using computer-tailored calendars to promote childhood immunization: a pilot study. *Public Health Rep* 1996;111:176-178.
56. Green LW, Tan J, Gold RS, Kreuter MW. EMPOWER/Canadian Health Expert System: The application of artificial intelligence and expert system technology to community health program planning and evaluation. *Canadian Medical Informatics* 1994;Nov/Dec:20-23.
57. Lehoux P, Potvin L, Proulx M. Linking users' views with utilization processes in the evaluation of interactive software. *The Canadian Journal of Program Evaluation* 1999;14(1):117-140.
58. Lehoux P, Proulx M, Potvin L, Green LW. An evaluation in Montreal of interactive software to support decisions in planning screening mammography programs [abstract]. *Annual Meeting of the International Society of Technology Assessment in Health Care* 1997;13:94.
59. Gold R, Green LW, Kreuter MW. EMPOWER: Enabling Methods of Planning and Organizing Within Everyone's Reach (International Version 2.01, Software and Manual). Boston: Jones & Bartlett Publishing, 1997.
60. Skinner CS, Kreuter MW. Using theories in planning interactive computer programs. In RL Street, WR Gold, T Manning (Eds.), *Health Promotion and Interactive Technology*. Mahwah, NJ: Lawrence Erlbaum Associates, 1997;39-650.