Chapter Six: Transferability

Introduction

What factors should be considered to determine whether emergent learning from projects is generalizable to other contexts? To what extent can local advances in primary health care be applied to other regions, provinces, or countries? Furthermore, if a particular finding or observation is deemed generalizable, what are the most appropriate mechanisms for disseminating that information? These are questions of transferability.

Generalizability and transferability are related concepts. Transferability, in a generic sense, refers to the ability to apply something learned in one context to another context. Technically, transferability means the ability to transfer. Generalizability is more commonly associated with research methods and statistics, and refers to the extent to which findings within one context (usually a sample from a population) can be considered valid (or representative) of a larger context (usually a population). Generalizable findings, however, may not always be transferable.

Transferability is identified as one of the six national dimensions of inquiry of the Health Transition Fund (HTF) (Health Canada, 1998). Health Canada is interested in knowing which findings from the HTF projects are useful to other jurisdictions. The HTF evaluation framework asks evaluators to consider

(a) relationships between the characteristics of project implementation and outcomes;
(b) system pre-requisites and obstacles for success;
(c) innovative aspects of projects;
(d) the influence of integration/coordination of services on goal achievement;
(e) project elements and project applicability to other settings, including what is needed to enhance applicability;
(f) population groups most likely to benefit from the model or program; and
(g) impact on the utilization of non-health social services (Health Canada, 1998).

Ultimately, there will be certain aspects that are unique to each project (e.g., location, provider mix, personnel, and enthusiasm). These should be clearly articulated so that others implementing similar projects can judge the extent to which these factors will significantly alter implementation processes and project outcomes across different contexts. Contextual factors such as resources, geography, available personnel, training, and experience should be adequately addressed to facilitate transfer of learning from one site to another.

Factors such as these are discussed throughout this chapter, as well as the proposition that transferability be considered in a broader context—that of generating new knowledge. The chapter concludes with a presentation and discussion of a framework developed by the Alberta Heritage Foundation for Medical Research (AHFMR) which may have some utility for those considering questions of transferability.

Generalizability and the Influence of Conventional Research Design

Generalizability refers to the "external validity" of research, that is, the degree of accuracy of findings *external* to the study population. Internal validity, conversely, refers to the degree of accuracy *within* a study population (Cook & Campbell, 1976). For example, a study has internal validity if a sample of 25 women report that their average weight is 100 pounds and their average weight actually is 100 pounds. The study lacks external validity, however, if these results are extrapolated to an estimation of the average weight of the population of all women. The initial sample was likely poorly selected, and thus biased and not representative of the overall population. The likelihood/probability of achieving external validity is increased if a random sample is selected that can be considered representative of the population being studied.

Rigor and study design influence transferability and generalizability of findings. A well designed research or evaluation study, in terms of recruitment of subjects, research and statistical design, and methodology, is more likely to yield findings that can be generalized to a larger population. Whether conducting an experimental study or a process evaluation, the rigor with which each of the study elements is carried out is of prime interest for determining the likelihood of generalizability of findings.

The concepts of transferability and generalizability lie at the very core of solid experimental research. The purpose of conducting experiments with carefully selected samples, for example, is often to test hypotheses about the effectiveness of an intervention, or way of doing things. In this case it is "*primary health care*." Does the primary health care approach result in

better outcomes than existing or alternative approaches to delivering care? How well the study is designed will dictate how trustworthy the findings are and consequently whether they are generalizable to broader populations.

In reality, many health care projects lack pre-post or experimental designs because of a shortage of time or resources and other constraints (Nerenz, 1996). The rapid pace at which organizational change occurs often renders research findings obsolete before they can be published. Ethical considerations further influence conducting research with human subjects. It is often not possible nor ethical to withhold services in order to measure impact or effect.

Several authors have described the limitations of conventional randomized controlled trials within health care studies (e.g., Schulberg et al., 1993; Wells, 1999). In a study to evaluate the cost-effectiveness of improving care for depression in primary care, Wells (1999) described the "trade-off between certainty of causal inference and generalizability to usual care conditions" (p. 20). His study illustrated that patients with specialized needs are often used in clinical trials. However, for purposes of policy and clinical management planning, data are needed to determine the impact of treatments on long-term outcomes for typical patients under usual care conditions. That is, whereas the selected population would enhance certainty of causal inference, results are not generalizable to the population seen under usual care conditions (i.e., typical patients often have several comorbid conditions and are not highly specialized). [24]

Some researchers have employed health care assessments rather than randomized controlled trials to determine the generalizability of findings from one health sector to another. For example, Schulberg et al. (1993) studied whether treatments effective in the psychiatric setting were generalizable to the primary care setting. The authors noted that rigorous recruitment criteria enhanced randomized controlled trials' internal validity but tended to "homogenize the study sample" thereby reducing generalizability. (Researchers often limit age and other socio-demographic factors and specify parameters of disease severity, which results in a homogenous study sample. By setting these criteria, researchers limit the number of eligible patients and therefore subjects are less representative of populations experiencing the conditions under study.)

Health care assessment is mainly concerned with generalizing findings about effectiveness of care to typical medical settings. To increase generalizability, health care assessments follow "naturalistic" cohorts of

[24] Wells' study design blends health services and clinical research approaches, resulting in an approach that is more generalizable to "usual care." Usual care is defined as "closely approximately ordinary physician practice" (Schulberg et. al., 1993, p. 39).

patients in non-laboratory field settings, and use data from numerous sources to investigate the appropriateness of variations in existing medical practice. Thus, health care assessments can achieve impressive external validity (i.e., findings will be generalizable), but create unavoidable selection and measurement biases which compromise internal validity (Schulberg et al., 1993)—an ever present tension.

A Viable Alternative

Process, implementation, and formative studies are more common in health settings. The downside is that generalizability in a strict statistical sense may not be possible. However, process and formative findings contribute valuable information, for example, that relate to context, project initiation, and facilitators and barriers to implementation.

When it is impossible or impractical to achieve generalization based on statistical inferences (which is most often the case in health system projects) researchers rely on other forms of data collection. Indeed, many forms of data collection can yield valuable information. Case studies, for example, can be used to develop a deeper understanding of individual experiences and overall system change. Case study research is "perfectly capable of producing valid generalizations so long as the distinction between empirical and theoretical generalization is grasped and it is recognized that case study research usually needs to be generalized theoretically" (Sharp, 1998, p. 789). *Empirical generalizability* is achieved through empirical observation and statistical inference whereas *theoretical generalizability* is based on the plausibility or logic of the findings. While empirical generalizations may show that some relevant characteristics of a sample are typical of a population, theoretical generalizations are necessary to provide *explanations* of the relationships between those characteristics of variables.

Lomas (1997) cautions that "the unit of research transfer should rarely be the single study" (p. 9) but rather a synthesis and compilation of findings. If outcomes are observed consistently, across time and across multiple settings, it is more likely that they are a result of the change or the intervention, rather than chance. Only when this is certain, or highly probable, should findings be considered generalizable and attempts made to disseminate the information.

It is also important to ensure proper interpretation of research findings. Lomas (1997) argues that this can be enhanced by involving researchers and evaluators in the decision-making process to ensure that findings are interpreted correctly. For the same reasons it is essential that researchers gather objective opinions during analysis to ensure that their biases are not

entrenched in the results/findings, and there is a proper acknowledgement of contextual and political factors. Optimally, there should be an open and participatory communication structure between researchers, evaluators, industry funders, and decision makers.

Dissemination

If research findings are deemed generalizable, practitioners, researchers and policy makers are faced with the task of considering the most appropriate ways to disseminate findings. This section includes a brief overview of the *dissemination of information* literature, including a discussion of the difference between diffusion and dissemination. In addition, dissemination research is distinguished from dissemination activities.

Diffusion and Dissemination

There has been some debate about the difference between active dissemination versus passive diffusion of information, or innovations. Many authors have differentiated diffusion from dissemination, with the former representing a passive process and the latter an active process (e.g., Agency for Health Care Policy and Research, 1992; Gelskey, Harvey, Buchan, Guilfoyle, Hook, McCutcheon, Minaker, & Murdoch-Schon, 1996; Green & Johnson, 1996).

Diffusion of Innovations

Rogers' (1995) seminal work on the *Diffusion of Innovations Theory* has been widely applied in many areas including health and social services. Innovation is "an idea, practice or object that is perceived as new by an individual or other unit of adoption" (Rogers, 1995, p. 11). The theory is based on the mathematical *S*-shaped growth curve that demonstrates an initial slow spread, followed by acceleration of growth, and ultimately deceleration of growth. People can be seen as holding places along this curve. "Innovators" are at the beginning of the curve; "early adopters" and "early majority" at the initial acceleration stage; the "middle majority" at the late portion of acceleration and early period of deceleration; and "late adopters" at the late stage of deceleration.

The *Diffusion of Innovations Theory* was used as the basis for developing strategies for monitoring and evaluating projects within the Ontario Health Innovation Fund (Dibert, 1993). Analyzing why some projects were successfully adopted and others were not, according to the researchers, confirmed much of the theory on diffusion. However, they also found that factors other than specific diffusion strategies assisted in successful

replication and adoption. Projects that demonstrated true innovation, caught the imagination and attention of decision makers, had proven results, and were sponsored by innovators willing to promote their ideas were the most successfully diffused. Notably, the researchers reported that their greatest lesson was that diffusion could not be left to a natural process. Rather, it must become an explicit agenda item for both innovators and funders.

Dissemination of Information

To reiterate, *dissemination* is an active process, as compared to *diffusion* which is a passive process. Dissemination has been defined as "deliberate efforts to spread an innovation" (Crosswaite & Curtice, 1994, p. 290) where potential adopters of innovations are sought out. Dissemination has also been defined as the deliberate communication of information about an innovation to potential adopters (Backer & Rogers, 1993).

Dissemination Research versus Dissemination Activities

It is important to differentiate between dissemination activities and dissemination research. Dissemination activities are designed to (1) convey information regarding effective health programs to public health officials, other health professionals, and community leaders, and (2) inform the public and health professionals about health-related matters (Stoto, Green, & Bailey, 1997). Dissemination research seeks to identify better ways to communicate information to the public and to practitioners to ensure that dissemination processes are validated, documented, and shared (Stoto et al., 1997). Dissemination research can be applied to dissemination activities and used to formulate dissemination plans.

Linking Knowledge and Practice

There are many purposes for disseminating information, including to share new knowledge, to further education, and to improve practice. A key challenge for dissemination activities is bridging the gap between knowledge and its application; that is, to narrow the gap between what is known and what is put into practice (e.g., Lomas, 1997, MacLean, 1996).

Changes in knowledge do not automatically lead to changes in behaviour—a well-established psychological phenomenon (Zimbardo & Gerrig, 1996). For example, it took 263 years for the British merchant navy to introduce citrus juice to prevent scurvy despite existing evidence to support its effectiveness (Lomas, 1997).

It is important to improve methods of research dissemination and uptake. However, this is a challenging task. For example, Lomas (1997) observes

that there is often a great deal of tension and disconnect between researchers responsible for compiling information and decision makers whose focus is on the applicability, usefulness, and context dependency of findings. The process has been compared to "two people trying to assemble a jigsaw puzzle, each with half the pieces… but each working in a separate room " (Lomas, 1997, p. 1). Indeed, one of the major challenges of dissemination is bridging the communication and policy gap between the producers of research and the users of research. Moreover, research information is only one of a number of determinants of the policies adopted by decision makers and practitioners (Lomas, 1990a). Various other contextual and political factors must be considered when planning dissemination activities.

There is great potential for the health system to learn from marketing successes in the business sector which are founded on early consideration of such things as the size of the target audience, the potential for product marketing and appropriate channels or vehicles for information sharing. Indeed, *social marketing* shares many of these principles and has been used extensively in the health promotion field. Health Canada (1999) describes social marketing as follows:

> Social marketing is a planned process for influencing change. . . . Social marketing combines the best elements of the traditional approaches to social change in an integrated planning and action framework, and utilizes advances in communication technology and marketing skills. It uses marketing techniques to generate discussion and promote information, attitudes, values and behaviours. By doing so, it helps to create a climate conducive to social and behavioral change (p. 1).

Dissemination should be directed not only toward increasing awareness but also toward changing attitudes, knowledge, beliefs, and behaviour. Even if dissemination rarely leads to action, according to Lomas (1990), it is important to continue striving to improve dissemination strategies.

What, then, is the best way to disseminate information? This depends on multiple variables, including the target population and the message. Lomas' review (1990) of the impact of consensus recommendations on practitioner behaviour addresses the effectiveness of dissemination strategies. The three most frequently cited potential sources for obtaining information about consensus recommendations among practitioners were professional medical journals, printed materials such as booklets, and the popular press. Lomas found that direct mailing of print materials to the relevant practitioner population also increased awareness, but this was not always linked to changes in behaviour or practice. This finding is relevant to the Health Transition Fund Primary Health Care Project. That is, for

effective dissemination and uptake of new information, primary health care providers should be included as key stakeholders in the entire research and dissemination process. Provider involvement is important to garner support, encourage participation, and promote openness to new information and changes in practice.

Lomas' findings are supported by many other researchers who have reported the importance of including key stakeholders from the beginning of the research process to increase utilization of research findings. Indeed "early and ongoing involvement of decision makers . . . is the best predictor of [research] utilization" (Lomas, 1997, p. 8). Moreover, community mobilization has been facilitated in rural areas when early adopters (as predicted by Rogers' Diffusion Theory) motivate others and act as opinion leaders (Johnson et al. 1996).

Elements of Information

What constitutes "information" within dissemination of information? Elements of information can range from very specific (e.g., data elements) to broader, system elements (e.g., organizational change, governance, or funding structure). The element for transfer may be specific learnings about what worked and what did not work within projects or new ways of doing things (innovations). This may entail the transfer of data within a project (e.g., via an integrated delivery system where data is available to all members of the health team over a shared computer system, regardless of location), or across an entire province (e.g., Alberta we//net). Dissemination activities can be facilitated with the availability of information systems, computer technology, and computer programming specialists.

Key Mechanisms for Dissemination

What are the key mechanisms for and facilitators of dissemination? Vehicles for the transfer and dissemination of information have changed considerably over the past several decades. For example, an initial review of the literature revealed a wealth of dissemination of information studies conducted in the 1970s, with a strong focus on the library and information science fields. More recently, the potential for dissemination has increased exponentially with the growing popularity of personal computers and the Internet. Computer technology is increasingly being harnessed as key vehicle for information dissemination. In addition to information technology, other suggestions have been made for successful dissemination.

Findings from the Manitoba Heart Health Project indicated that a local community heart health committee and local facilitator were the key mechanisms for the dissemination and implementation of heart health programs in rural communities (Gelskey et al., 1996). The researchers found that the success of the community committees was dependent upon their capacity to identify needs, set priorities among needs, select programs to address needs, and establish structures in the community to implement and maintain programs. The community committee success was considered dependent upon their level of technical skill and ability to interface with other organizations and community groups.

Key Players in the Dissemination Process

Who are the key players in the dissemination process? Through whom does dissemination occur? Key players include opinion leaders, change makers, and influential and respected members of society. They may be individuals, groups, communities, professional groups, or others. Based on Rogers' Diffusion of Innovation Model, key players are likely early adopters of innovation. These individuals may encourage the uptake of new behaviours by other community members.

Essentially, dissemination is a communication process (Lomas, 1997). The interpersonal and human elements of dissemination should not be underestimated. It is important to recognize that dissemination will ultimately involve people and interpersonal communication. Various human resource approaches have been implemented to improve dissemination processes; for example, training decision makers how to find and assimilate relevant research, exposing researchers to the decision-making context, and introducing "knowledge brokers" into the research and dissemination arena. Knowledge brokers are individuals specifically dedicated to improving dissemination and uptake of research findings.

Contextual Factors—The Alberta Context

Dissemination happens within a context. It is important to consider contextual factors such as geography and political readiness when planning a dissemination strategy. Contextual factors will affect what aspects of projects are generalizable and transferable to other sites across Canada. Thus, it is important to consider what factors are unique to the Alberta context.

Geography, Population Size, and Density

There are unique aspects in Alberta with respect to geography, population size, and density that should be considered when assessing the generalizability of research findings. For example, the Alberta population is less than three million and there are many small, rural, and northern communities (Statistics Canada, 1999). This creates significant implications for project findings from small rural populations compared with larger urban centres. Also, there may be differences between northern and southern populations. There may be other differences between ethnic and religious groups. These should be addressed when considering generalizability of project findings. Wherever possible, if widespread generalizability and dissemination is the goal, projects should be tested in various sites to determine whether results are location-specific.

Political context

Dissemination research and dissemination activities cannot be separated from political and implementation questions (Johnson et al., 1996). For example, there are implications of publicly-funded and universally-accessible health care services and the provisions of the *Canada Health Act*. What works in Canada, for example, may be embedded in the political realities of our social system and may not be generalizable to other countries. Similarly, findings from the international literature (e.g., from projects implemented within private, for-profit health care systems) must be interpreted with caution when determining their applicability and generalizability to a Canadian context. Further, the optimal methods for disseminating information may differ according to political contexts. For example, freedom of information and freedom of speech policies may affect the ability to implement widespread dissemination activities.

Resources

Resources, both financial and human, will contribute to the likelihood of effective information dissemination. It is important to examine funding sources and how they will be used. What are the salaries, office supplies, and operating costs? What kinds of personnel (training, experience, and personality) need to be involved? What are their special skills?

Transferability Evaluation

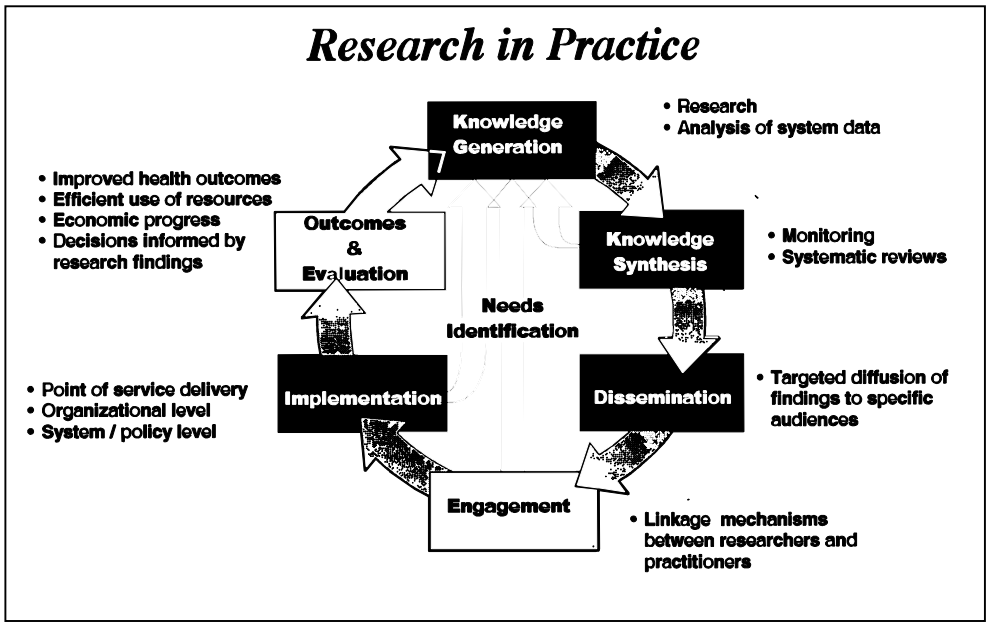
As with any initiative, the Alberta Primary Health Care Project must learn from experience. Capturing experience through evaluation is one thing. Transferring learning to other settings is another. Ensuring the translation

of learning into measurable improvements in health status or health systems poses an even greater challenge.

The Alberta Heritage Foundation for Medical Research (AHFMR) guided by a Task Force has pursued the task of better understanding a common theme that suggests a great deal of research and learning is not utilized in practice. To that end they have outlined a framework for discussion (see Figure 6.1) to assist in "capturing some of the elements and complexities of a system which would enable and support positive health and health system outcomes from research" (AHFMR, 1999, p.4). Also, there may be some utility in using this model to discuss transferability.

While the AHFMR Framework has not been formally tested, it offers a way to think about how various elements along the journey of "knowing" stimulate the generation of new knowledge. It offers a systematic process of considering how information and knowledge generated in one context can be transferred to another.

Figure 6.1. Research in Practice.



Note. From *Research in Practice in the Alberta Health System. Where to From Here?* (p. 11) by Alberta Heritage Foundation for Medical Research, 1999, Calgary, Alberta: Author. Copyright 1999 by Alberta Heritage Foundation for Medical Research. Reprinted with permission.

Knowledge Generation

Knowledge generation is information that can be used in the applied health fields. It may consist of biomedical, clinical, psycho-social, population health, or administrative data. Knowledge generation, either through

theoretical or applied practice, can be considered stage one in the AHFMR framework.

Knowledge Synthesis

Knowledge synthesis is the systematic review of research findings within some clearly defined area. In many respects it is the assessment of the evidence in determining the merit of changing a practice or a policy.

Dissemination

In this framework dissemination refers to "purposeful sharing" of findings with "specific target groups."

Engagement

Often information/knowledge is created and purposefully shared with specific target groups. Engagement is the step in the process of new knowledge generation where decision makers and other stakeholders attend to the information and begin to understand the potential for utility in the information. A central aspect of engagement is engagement between research generators and research users, and mixing of cultures and individuals.

Implementation

Implementation occurs at a variety of levels (policy, organizational, program) where information generated by research and evaluation processes is incorporated into decision-making processes.

Outcomes & Evaluation

While acting on valid information is admirable, a further step of assessment is required before the cycle of new knowledge generation is complete. The outcomes and evaluation stage in the knowledge generation framework is marked by assessment of the degree to which expectations have been met and knowledge has been incorporated into practice.

Conclusion

Generalizability, dissemination, and transferability of information are interrelated concepts. They are all aspects of sharing knowledge. Generalizability has been presented as the external validity of research findings. That is, how representative of external populations are the research, evaluation, or demonstration findings? In the qualitative sense,

this means the degree to which project findings resonate with the experiences of an external audience. Generalizability is increased by using and rigorously applying appropriate research and evaluation designs.

Dissemination of information represents an active process—the deliberate communication of information about an innovation to potential users (Backer & Rogers, 1993). An innovation is "an idea, practice, or object that is perceived as new by an individual or other unit of adoption" (Rogers, 1995, p. 11). Ultimately, dissemination is a communication process, and complex interpersonal factors must be addressed and explored when constructing a dissemination plan. Dissemination of information does not automatically lead to the uptake of new behaviour. However, some attention to dissemination research can improve dissemination activities and maximize the likelihood that intended changes are implemented.