

# Transferring community-based interventions to new settings: a case study in heart health cholesterol testing from urban USA to rural Australia

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## SUMMARY

*Health promoters wishing to successfully replicate community-based heart health interventions from major research and demonstration programs, face numerous obstacles in the adoption process. Unfortunately, there is little specific literature to guide them through the process. A case study is presented to demonstrate that by closely examining differences between the resources and user settings in terms of geography, socio-demography, policy, organizational structure and perceived goals, health promoters can identify and avoid failure points. We examine the transfer and adaptation of a cholesterol intervention from*

*Pawtucket Heart Health Program in urban USA to a rural setting in Australia and we recommend a series of five logical steps when considering such adoptions. Process data from the adapted intervention, North Coast Cholesterol Check campaign, indicates that it is as successful as its counterpart in the USA. The new intervention has itself become a model program in Australia. This success can be largely attributed to the considerable planning effort which made it possible to modify the organizational structure to accept an innovative strategy and also to tailor the resource program for an ideal fit to the new user setting.*

*Key words:* cholesterol; cholesterol screening; community programs

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## INTRODUCTION

Large scale research and demonstration health promotion programs have developed community intervention strategies which can significantly improve risk profiles of target populations. This is particularly true in the field of heart disease where major advances in community-based intervention methodology have been made within the past decade by research programs such as North Karelia, Stanford, Minnesota and Pawtucket (Blackburn *et al.*, 1984; Farquhar *et al.*, 1985; Puska *et al.*, 1985; Carleton *et al.*,

1988). Such programs 'diffuse' their innovations by publishing their methodologies and results in scientific journals.

When health promoters in other parts of the world plan local heart health interventions of a similar nature, they typically start by reviewing the published accounts of these major projects. The subsequent process of program adoption is the subject of this paper.

On the basis of acquired knowledge, and often aided by collaborative linkage with the originating

'resource systems', health promoters attempt to adapt and implement innovative strategies within their 'user system' (Glanz *et al.*, 1990). There are a number of recent examples of this process in the context of community-based heart health intervention strategy, but their publications rarely address the specific nature of their origins (Greiser, 1984; Catford and Parish, 1989; Norman *et al.*, 1990).

Community-based strategies, by definition, require more interaction with community systems than do either individual-based or strictly media-based strategies. Collaborating with multiple sectors of the community (business, political, educational, religious, recreation, community groups, economic) is a necessary aspect of effective programs (Thompson and Kinne, 1990). Yet, this process and its more qualitative results, are not readily available to new users of these innovations.

While the dissemination of these methods is important for the growth and development of community-based research and practice, there has been no systematic attempt, adequately documented, to allow for this to happen. A particular lack of published work in two related areas is also apparent:

- problems commonly encountered when adopting community-based programs, and
- appropriate solutions that are often readily available.

Our personal communications with health promoters indicate that the process of adopting innovative heart health intervention strategies often flounders because published accounts of the strategies themselves usually include only a brief description of the program itself. There are also few publication outlets for the types of articles that discuss the plethora of problems encountered in the implementation or diffusion process. There is also limited direct linkage of potential 'adopters' with the 'resource system'. Consequently, perceived obstacles associated with adopting the strategy in a new setting can make the process appear too nebulous and daunting in view of generally limited resources. Obstacles frequently encountered by adopter agencies are:

- perceived lack of finance or time necessary to plan, pilot and implement the intervention as described;
- perceived lack of fit with current politics, policy and organizational structure;

- perceived inappropriateness to a different geographical and social setting;
- perceived lack of ability to undertake the rigorous evaluation indicated by publications from within the resource system; and
- a lack of adequate documentation of the intervention protocol by the resource system.

Many of these issues presented themselves during the establishment of the North Coast Cholesterol Check Campaign (NCCCC) in Australia. In essence, this campaign represents the adoption of an innovative cholesterol intervention strategy developed during a major US research program, the Pawtucket Heart Health Program (PHHP). Although both the resource and user programs were targeted at low socio-economic populations, the resource program, PHHP, was designed for an urban area of Rhode Island, USA whereas the user program, NCCCC, had a rural setting in New South Wales, Australia.

Analysis of the Pawtucket strategy, and its adaptation to rural Australia, provides an ideal case study of the adoption process, its inherent problems, and the solutions that facilitated an effective intervention in the new setting.

The case study is presented as a series of answers to the principal questions that we believe should constitute the process of adoption from the resource setting to the user setting. These questions are:

- What is the geographic, social, political, policy and organizational setting of the resource intervention?
- How does the resource intervention function within this setting and what are its resource requirements?
- Is the resource intervention appropriate to the adopter's goals and setting, in full or in part?
- How should the adopter modify the local setting to enable transfer of all components essential to program success?
- How should the adopter tailor the program itself to suit the local setting?

## CASE STUDY OF A PROGRAM ADOPTION

*What is the geographic, social, political, policy and organizational setting of the resource intervention?*

Pawtucket is a city of 72 000 people in Rhode Island, the smallest state of the USA; it covers an area of 25 square miles and is highly urbanized and industrialized. The population is predomi-

nantly blue collar, ethnically highly heterogeneous (95% White, 3.5% Hispanic, 1.4% Black, 3.3% other) and has a large non-English speaking component (12%). Socio-economic conditions are poor, with many socially disadvantaged persons and subgroups (12% below poverty line in the 1980 US Census).

The Pawtucket Heart Health Program was developed in a hospital/university context and is based within the Memorial Hospital, which administers a large research and demonstration grant from the National Heart, Lung and Blood Institute of the National Institutes of Health. It was established in 1980 as an 11 year project, and has a staff of 75 (see Table 1).

PHHP is divided into three major units: Intervention, Evaluation and Administration. The Intervention Unit is further divided into the subunits: Risk Factor, Volunteers, Channels and Marketing. The Evaluation Unit consists of Data Management, Survey/Surveillance and Formative/Process.

Approximately 20% of resources are used for the community intervention itself, and about 60% for a comprehensive research and evaluation program.

*How does the resource intervention function within the geographic, political and organizational setting and what are its resource requirements?*

The PHHP intervention program is a comprehensive, volunteer-driven, community-based,

multiple risk factor program. Program delivery follows principles of social marketing and social learning theory (Lefebvre *et al.*, 1987). Within this context, the community of Pawtucket is exposed to multiple intervention activities, conducted continuously, at a number of community levels. They include self-help activities; small group activities; public screenings; programs in work-sites, schools and religious organizations; public events and media campaigns. Risk factors for intervention are blood pressure, cholesterol, smoking, lack of exercise and overweight. Many different segments of the community are targeted including children, adolescents, older adults, families, minority ethnic groups and low income populations.

Research and evaluation components include surveys and morbidity/mortality surveillance in both Pawtucket and a nearby comparison community, as well as sophisticated tracking of all intervention activities, all participants in those activities and all members of the first community survey, which has served as a cohort for subsequent study (Assaf *et al.*, 1988; McGraw *et al.*, 1989).

Details of the general program and many of its component interventions have been described elsewhere (Elder *et al.*, 1986; Peterson *et al.*, 1986; Lefebvre *et al.*, 1986, 1988, 1990a); the following discussion will focus on the Cholesterol Program, a major intervention of PHHP, and the specific strategy chosen for transfer to Australia.

**Table 1.** Comparison of program setting in Pawtucket, USA and North Coast, New South Wales, Australia.

Category	Pawtucket (USA)	North Coast (Aus)
Population density, zoning	One large city of 72 000 in area 5 × 10 miles. High density with large industrial component.	Population of 430 000 in many towns in 300 × 80 miles. Low density rural residential with some rural industry.
People	Heterogeneous, large ethnic and non-English speaking components.	Homogeneous, small aboriginal component, all English speaking.
Socio-economic status	Blue-collar, low income, socially disadvantaged.	Farming, high unemployment, low income, socially disadvantaged
Policy/organization	Hospital and university collaboration, program run from hospital setting.	State health department, Regional Health Promotion Service, independent of hospitals.
Funding	Large federal grant, 65% research/evaluation, for comprehensive community-based program.	Small state health allocation, with matching funds from Region, 10% for evaluation.
Attitudes to volunteer use	Integral part of all health programs.	Essential to Regional program plan but viewed suspiciously by health staff.

The PHHP Cholesterol Program is a community-based, nutrition education intervention. Its goal is to make all members of the Pawtucket community aware of the role of diet and high blood cholesterol levels in Cardiovascular Disease (CVD). Cholesterol screenings are used as a trigger for nutrition education within the community.

The program is conducted in the form of screening, counselling and referral events (SCORE) run by lay volunteers. SCOREs are designed, marketed and implemented through co-operation of the four teams in the Intervention Unit. A brief overview of the screening event will clarify this process.

- Participants are registered by a 'Registrar', pay a fee and complete a contact data card.
- They are asked to complete a brief dietary assessment developed by PHHP.
- Height and weight are measured and recorded by a 'Height/Weight Technician'.
- A blood sample is taken by a 'Cholesterol Measurement Technician' and total blood cholesterol assayed and recorded on the spot, using a desktop analyzer.
- Each participant is counselled by a 'Summary and Referral Counselor', on the basis of their diet/cholesterol profile. The focus of this counselling is to improve health practices and, if necessary, to refer participants to their doctor for further tests. All SCORE participants, regardless of their blood cholesterol level or diet assessment result, receive a self-help kit on lowering fat, saturated fat and cholesterol in one's eating pattern.
- They are advised to return for a repeat test, sometimes held in the same location as the original SCORE (i.e. a worksite), or at the 'Main Artery', a storefront located in downtown Pawtucket.

Each of these steps is carefully protocolled and documented for training purposes (Lefebvre *et al.*, 1990b). A 'SCORE supervisor' is present at each event to insure that staff adhere to the protocol, and to troubleshoot problems. A 'Product Manager' from the Risk Factor team takes overall responsibility for the intervention. Volunteers for each of the various SCORE roles are actively recruited by the Volunteer Team, at the request of the Product Manager, and the Risk Factor Team then trains and certifies them at the PHHP office as required. The Risk Factor Team

prepares comprehensive training manuals and teaching aids with the co-operation of the Marketing Team. It also sets quality standards and monitors quality during training and at the community SCOREs.

The Channell Team works with the Risk Factor and Marketing Teams to tailor the SCORE presentation and delivery to suit particular target groups within the community—schools, worksites and community settings—and actively to recruit these sites. A van is used to transport equipment to the SCORE sites and fees are costed on a break-even basis.

Evaluation of the cholesterol program is based on participant contact data cards and activity cards which supervisors complete for each SCORE. Data Management audits each card and enters the information into the project database; the Formative and Process Section provides quarterly updates on the program. Further in-depth analysis and publication on specific research questions involves collaboration between the Intervention and Evaluation Units, using formalized data request, analysis and publication protocols.

*Is the resource intervention appropriate to the adopter's goals and setting, in full or in part?*

The North Coast Health Region, in the state of New South Wales, Australia has a population of 430 000, distributed in many villages and towns of sizes ranging up to 40 000. It is predominantly a farming, rural and residential area, approximately 300 miles by 80 miles.

The population is homogeneous to the extent that the majority are English speaking with basic literary skills. The main minority group is a 2% Aboriginal component. Socio-economic conditions are poor, with unemployment at 17%, and a low average family income. In some areas up to 46% of the population are on government pensions.

The North Coast Heart Health Program (NCHHP) is part of the North Coast Health Promotion Services and comes under the direction of the State Health Department, which also administers the hospital system. As such, NCHHP functions, and is funded, independently of either the hospital or community nursing organizations. The goal of NCHHP is to reduce cardiovascular risk throughout the region by implementing low-cost, far reaching, community-based interventions (James *et al.*, 1989 a, b; van Beurden *et al.*, 1991).

### Selecting an appropriate strategy

When the NCHHP Director (R. James) established the unit and reviewed appropriate interventions, the Pawtucket approach seemed ideally suited for a number of reasons.

- The social marketing model was compatible with the already established principles of the Health Promotion Services. It also suited the centralized media and commercial network systems of the North Coast region.
- A large volunteer workforce would be the only way in which a region-wide heart health intervention could be initiated cost-efficiently.
- Training could be provided to enable communities which were widespread within the region to play a key role in their own programs.
- Models for training and implementation protocols and materials were available from the PHHP.

*How should the adopter modify the local setting to enable transfer of all components essential to program success?*

Large scale community-based interventions generally require changes in the structures of existing health care systems. In 1986, the concept of an organized, large community-based, region-wide Health Promotion campaign was new to the North Coast Health Region. Until then the small health promotion component of area hospital budgets had been either totally absorbed into the clinical milieu, or, in some areas, community nurses and dietitians had been permitted to engage in low-profile health promotion activities. None of these personnel had training in principles of coronary heart disease (CHD) prevention or experience in comprehensive community-based campaigns.

Furthermore, the use of volunteers within the health system, and particularly in the field of health promotion, was untried and actively discouraged. The key tasks in setting up a large-scale community intervention in this situation were:

- to ensure that allocated funding was used in health promotion activities;
- to convince area hospital administrators that their community-based health staff should take part in a region-wide health promotion program;
- to establish training of community health staff in the principles of community-based health promotion; and

- to establish the credibility of volunteers in health promotion activities.

Imaginative planning and persistent lobbying were used to accomplish these tasks. When organizational support for the implementation was secured, the Australian version of the SCORE protocol was developed and pilot tested over a period of 3 months. Periodic mail or telephone correspondence with PHHP (R. C. Lefebvre) served to guide and review progress in these areas.

When the above obstacles were overcome and the appropriate changes made to both policy and organizational structure, the NCHHP was able to initiate its first regional community-based cholesterol reduction campaign just 2 years after the start of its resource counterpart in Pawtucket.

*How should the adopter tailor the program to suit the local setting?*

In order to reduce cardiovascular risk in a population of 430 000, spread over an area of 24 000 square miles, on a shoestring budget, choices must be made when considering adoption of comprehensive intervention strategy such as PHHP—which was developed on a much larger budget, for a relatively small and localized population. The choice of the NCHHP was initially to adopt only one, manageable component intervention, namely the Cholesterol SCORE.

At this stage, NCHHP consisted of two staff: a Director and a Project Officer. With the backing of the Regional Office of the State Health Department, and with all of the necessary policy and organizational changes in place, the process of adapting SCOREs to their new setting began under the banner of the North Coast Cholesterol Check Campaign (NCCCC).

NCCCC set as its primary goal the task of screening 20% of the adult population in 5 years and educating participants regarding the relationship between diet, high blood cholesterol and coronary heart disease. The second goal was to reduce significantly blood cholesterol levels among those who were at elevated risk. The third goal was to activate the whole community so that within 5 years 80% of all adults would have had their blood cholesterol measured and be aware of the diet-cholesterol link.

In setting these goals, other conditions were placed on the adoption. Evaluation would be required only to demonstrate that the process was functioning optimally, and would be limited



financially to 10% of total resources. A participant tracking system was established, but large-scale surveys, control populations and morbidity/mortality surveillance could not be justified.

A further limitation of program transfer, based on scarce resources, was that in the SCORE process only those with elevated blood cholesterol levels would receive specific dietary counselling and referral. Participants with low levels were given a National Heart Foundation brochure *Heart Facts*, encouraged to maintain a low fat diet and told to have regular annual check-ups. This reduced counselling requirements by half, allowing limited resources to be concentrated on those with elevated concentrations of blood cholesterol.

Another limitation dictated by geographic and logistic constraints was that each of the ten planning areas within the North Coast Region would be part of a yearly intervention cycle in which their local teams would have the Region's screening equipment for up to 1 week. This equipment included the NCCCC van, three Reflotrons (Boehringer-Mannheim Corporation, Mannheim, Federal Republic of Germany), plus all ancillary stores, scales, a height/weight stand, tables, chairs, partitions, posters and all necessary data recording stationery. During this 1 week period the teams were expected to screen 5% of the adult population in their region.

The follow-up procedure was also modified to suit the rural setting. Because it was considered of utmost importance to the process of behavior modification, NCCCC incorporated in its counselling protocol a verbal contract with participants to attend a 'free' follow-up test 3 months post-screening. Each participant was sent a reminder letter 2 weeks prior to the scheduled retest. Instead of one continuously operating centralized drop-in retest venue such as PHHP's 'Main Artery', each of the ten planning areas was given the regional retest equipment for 2 days, 3 months after their initial SCORE in the annual cycle. A retest venue was then set up in a centralized location within the area.

Possibly the most significant adaptation of the resource program was the delegation of all responsibility for all SCOREs to a local 'Supervisor' and a local 'Quality Control Person' (usually a community nurse) within each of the ten planning areas. It became their task to recruit local volunteers for all positions, rather than PHHP's strategy of recruitment through a central-

ized Volunteer Team. It was also their task to bring volunteers to sub-regional training workshops, whereas in PHHP the Volunteer Team performed this function. The supervisor also arranged all SCORE locations, local publicity (using NCCCC marketing material) and ran their local event. In PHHP, the Risk Factor and Channel Teams performed these roles. Finally, the Supervisor and Quality Control Person were responsible for checking all participant contact data cards and liaising with the regional project officer regarding the use of resources. In PHHP, data checking is done by specially trained auditors in Data Management and the 'Product Manager' of the Risk Factor Team is directly involved with program delivery.

In selecting screening sites it was recognized that community venues, such as shopping centers, yield a self-selected group that initially favors the 'early adopter' type. NCCCC decided to limit screenings primarily to such settings in order to initiate a diffusion process rapidly and efficiently within the community (Rogers, 1983). During the development phase a worksite pilot had proven costly and relatively ineffective in this context (Henrikson *et al.*, 1990). There were promising indications that participants in community sites were initiating diffusion of both the message and tendency to attend screening to other community members (Segal *et al.*, 1990).

The final major adaptation of the PHHP SCORE protocol was that counselling of participants would be based primarily on an NCCCC fact sheet, rather than a personal diet assessment as in PHHP. This fact sheet has an 'Eat Less Fat' message, and five specific ways to do it. The participant is asked to make a commitment to try one of these five ways.

### **The adapted innovation implemented in the user setting**

In all, the basic concept of the PHHP SCORE intervention has been conserved during transfer from urban USA to rural Australia. The intervention has the same goal and the general process is still community-based in its new setting, but has been adapted to a very different community.

Social marketing is still an intrinsic part of its delivery structure, only the emphasis of market segmentation has been shifted from between-sites to between-communities.

Social learning theory is still central to delivery, with the screening itself providing the stimulus for change, counselling providing the mechanism,

and the attraction of an improved risk profile at retest providing motivation and reinforcement.

The volunteer component has been preserved, but recruitment has been decentralized so that volunteers become heart health proponents within their own rural community.

After all these adaptations the programs are still remarkably similar, and the essential character of the resource intervention has been successfully adopted in a very different setting (see Table 2).

A summary of the first 3 years of process data

**Table 2:** Comparison of program strategy in Pawtucket, USA and North Coast, New South Wales, Australia.

Category	Pawtucket (USA)	North Coast (Aus)
Theoretical base	Community-based, social marketing, social learning theory, population approach.	Community-based, social marketing, behavior modification, high-risk approach.
Design	Quasi-experimental, cross sectional and cohort study.	Self-select cohort follow-up and opportunistic use of control.
Evaluation	Interim process and major outcome at end of intervention.	Interim process and selective interim impact.
SCORE context	One of many interventions offered simultaneously.	Primary focus in an intervention sequence.
Screening sites	Worksite, school, church, community in large city.	Community sites only, in ten areas of region.
Target group	All sectors of community and all risk levels.	All sectors of community through self-select joiners. Focus on elevated risk.
Professional staff	Large multi-level organization. $N = 75$	Small interdisciplinary planning team. $N = 2-5$ .
Volunteers	Recruitment highly organized and specific. Comprehensive training and accreditation.	Recruitment opportune and general. Comprehensive training and accreditation.
Time-frame	10 years.	5 years.
SCORE time-frame	Offered continuously at central site and regular part of other programs.	SCORES run 1-2 weeks each year in each area.
SCORE protocol	Screen and counsel all, refer highs, provide all with retest opportunity.	Screen all, counsel elevated and high. Retest for elevated only. Refer highs.
SCORE staffing (usual)	Supervisor, gatekeeper/weight, 2× measure, 4× summary/referral.	Supervisor, gatekeeper, height/weight, 2× measure, 2× summary/referral.
SCORE organization	Whole SCORE organized centrally including staffing and media.	SCOREs organized by local supervisor who advertises, selects staff and adapts within regional guidelines.
Training	Groups trained whenever replacements required; trained centrally.	Group training in each of ten areas of region once each year.
Transport	Van to deliver gear. Staff use own transport.	Van to deliver gear. Staff use own transport.
Income	Participants charged for cost of materials (US\$5-7).	Participants charged for cost of materials (AUST\$5).
Analyzer	Reflotron	Reflotron
Quality control	By central unit staff.	By local QC officer.
Dietary advice	Based on 2 page diet assessment completed by client at registration. Contract sought for two to three changes. Self-help nutrition kit given to all participants.	Program 'Fact Sheet' used to prompt client. Contract sought for one change.

from both programs is given in Tables 3 and 4. Only a general comparison of programs is possible because of the vast differences in settings. Table 3 includes SCOREs at all PPHP sites, including schools, worksites, churches and community sites. There are obvious similarities of scale at all levels of the data. The most striking difference is that, whereas there were fewer SCOREs conducted in rural Australia, they processed more participants than in urban USA. This difference probably reflects the fact that there was a larger population to be serviced in the North Coast and that the SCOREs and retests in rural Australia are only made available in an area once each year, and thus promotion is more intense, and access more focused.

These results also highlight the heavy reliance on volunteers in both the USA and Australia, where professional staff represent less than half of the SCORE workforce in both cases.

Table 4 summarizes SCORE data from community settings only. At community sites in both

countries there is a tendency towards older individuals and a higher percentage of women. The higher average age in Pawtucket reflects an older population in general, and this is reflected in the high blood cholesterol level. The overall similarities between the resource and adopter sites in their blood cholesterol screening experiences, as well as their consistency over 3 years of intervention, are noteworthy.

## CONCLUSIONS

The process of transferring and adapting a large-scale community-based intervention to a vastly different setting can be managed. Success is dependent on health promoters recognizing the problems inherent in such a transfer and acting accordingly by making the planning and piloting phase a major component of their program. By definition, community-based interventions require some changes in health policy and organi-

**Table 3:** Comparison of cholesterol score data for all sites during first 3 years of USA PPHP and Australian NCCCC.

	Year					
	1st		2nd		3rd	
	PHHP	NCCCC	PHHP	NCCCC	PHHP	NCCCC
SCORES	101	52	109	50	154	62
Professional staff	4	3	4	5	4	5
Health workers and volunteers	264	400	229	400	324	410
Participants	3730	12067	4751	10003	7125	9238
Contacts*	5021	15200	6642	12630	11760	11432

\* Includes participants who returned for follow-up measurement in same calendar year.

**Table 4:** Comparison of participant data of SCOREs at community sites only, during first 3 years of USA PPHP and Australian NCCCC programs.

	Year					
	1st		2nd		3rd	
	PHHP	NCCCC	PHHP	NCCCC	PHHP	NCCCC
Participants	2606	12067	3221	10003	4359	9238
% Females	58	60	56	58	55	58
Mean age	56	49	55	49	56	49
Cholesterol (mmol/l)	5.65	5.36	5.89	5.45	5.98	5.68
BMI	24.78	25.07	24.51	25.11	24.56	25.11



zational structure which may, in turn, require a start-up period of sustained advocacy and negotiation within the health system. By closely examining differences between the resource and user settings in geography, socio-demography, policy and community structure, and the goals of the interventions within these settings, health promoters can identify aspects of the source intervention which are not suited to their own setting and goals, and other aspects which may require some modification.

Finally, our experience demonstrates that a well-researched and planned transfer process may result in an even better fit of the adopted intervention to the new user setting than it was in the resource setting because of a shorter learning curve (i.e., capitalizing on lessons learned in the original setting). Documentation of protocols, realistic expectations of what can be achieved, and good communication between settings can result in successful replications of large-scale demonstration projects in distant and unique venues. If these differences are recognized and addressed, the final product should be free of system failure points which have caused other adoptions to flounder.

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