A B S T R A C T

The Canadian Heart Health Initiative-Ontario Project (CHHIOP) investigates predisposition and capacity in Ontario public health departments to implement community-based heart health promotion activities. The research draws upon diffusion of innovations theory and recent work on ecological approaches to health promotion within which public health agencies are seen to play a central role. Mail-back surveys were completed by heart health staff in all 42 health departments in 1994 and 1996. Predisposition and capacity were measured as the importance and effectiveness ascribed to 18 organizational practices supportive of community heart health activities. Level of implementation was reported for 74 activities spanning a range of risk factors and settings. Predisposition, capacity and implementation scores increased between 1994 and 1996. The findings confirm positive correlations between predisposition and capacity and between capacity and implementation.

A B R É G É

L'Initiative canadienne de santé du coeur - Projet ontarien (ICSCPO) examine la prédisposition et la capacité des services ontariens de santé publique à mettre en oeuvre des activités communautaires liées à la promotion de la santé du coeur. Les travaux de recherche s'inspirent de la théorie sur la diffusion des innovations et de récents travaux effectués sur les approches écologiques de la promotion de la santé, domaines où l'on considère que les organismes de santé publique jouent un rôle central. En 1994 et 1996, des personnes travaillant dans le domaine de la santé du coeur et représentant 42 services de santé différents ont rempli des enquêtes par courrier-réponse. La prédisposition et la capacité ont été mesurées au titre de l'importance et de l'efficacité conférées à 18 pratiques organisationnelles qui soutenaient des activités liées à la santé du coeur. Le niveau de mise en oeuvre a fait l'objet d'un compte-rendu dans le cadre de 74 activités diverses représentant des facteurs de risque et des milieux différents. Les notes attribuées à la prédisposition, la capacité et la mise en oeuvre se sont améliorées entre 1994 et 1996. Les résultats confirment l'existence de corrélations positives entre, d'une part, la prédisposition et la capacité et, d'autre part, la capacité et la mise en oeuvre.

Heart Health Promotion: Predisposition, Capacity and Implementation in Ontario Public Health Units, 1994-96

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Previous papers in this journal have described the Canadian Heart Health Initiative (CHHI)¹ and the Ontario Project (CHHIOP),² the first provincial project within the dissemination phase of the CHHI. This paper describes results from surveys conducted in all 42 public health departments in Ontario in 1994 and again in 1996. They reveal changes in the implementation of heart health promotion activities in Ontario communities over the two-year period and associated changes in the predisposition and capacity of health units related to heart health. They extend the findings reported in a previous paper based on the 1994 survey.³

The rationale for the research is found in diffusion of innovations theory⁴ and recent papers which propose an ecological approach to health promotion⁵⁻⁷ whereby improvements in population health are seen to depend on changes in the environments which both promote and sustain health-related behaviour.⁸ Modelled after Orlandi et al.⁹ and Green and Kreuter,¹⁰ the ecological framework for CHHIOP³ proposes a system which links the national and international heart health community with target populations. The role of public health organizations is particularly important given their political mandate and their mediating function between individuals and their environment.⁹ Following Green and Kreuter¹⁰ and Rogers,⁴ organizational effectiveness is linked to their predisposition and capacity, where predisposition refers to collective motivation for action;

and capacity is related to the skills and resources of the organization to take action. A major focus of CHHIOP is on the relations between *predisposition* and *capacity* of health departments and *implementation* of heart health activities in Ontario communities (Figure 1).³ A methodological challenge was to develop organizational level measures of these main constructs.¹¹

METHODS

In December 1994, predisposition, capacity and implementation were measured by a two-stage Survey of Capacities, Activities, and Needs (SCAN) of Ontario Public Health Units. The first stage measured levels of implementation of community-based heart health activities over the previous year in the geographic areas served by the public health units. It was completed for each health unit by or under the direction of the local Medical Officer of Health (MOH). All 42 health units participated. Respondents rated levels of implementation for 74 heart health promotion activities by risk factor and setting on a five-point scale (Table I). Ratings were made relative to "full implementation", defined as "ideal implementation in your community, not just to the extent that resources allow." This provides a common standard for comparison of scores across units and over time, but is likely to produce scores lower than might otherwise be expected if judgements were based on resource constraints. Average scores were calculated for overall implementation, the 4 risk factors and settings, and the 16 risk factor/setting combinations.

The second stage survey included several indicators of organizational capacity and

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predisposition for community-based heart health promotion. Surveys were completed by the MOH and approximately six additional unit staff nominated by the MOH as those most familiar with managing and/or delivering heart health activities. The response rate was 90% (n=262). The indicators of capacity reported here are effectiveness ratings of 18 organizational practices supportive of heart health, categorized into four areas: assessment, planning, evaluation, and activities to support implementation (Table II). Effectiveness in these four key areas is indicative of the skills and resources (i.e., capacity) of health departments to implement heart health promotion activities in their communities. The predisposition indicators used in this analysis are importance ratings for each of the same 18 organizational practices (Table II). The individual survey data were aggregated to give average scores for each health unit after confirming strong correlations between individual scores and within-unit means³ using the procedure described by James¹⁷ and Shrout and Fleiss.¹⁵

In December 1996, the surveys were repeated to determine heart health predisposition, capacity and implementation for the preceding 12 months, thus providing comparable data for all 42 health units with a two-year interval between the two surveys. The main difference in the 1996 survey was that the corporate and individual surveys were combined into a single instrument which was completed corporately by the MOH and staff most involved with heart health promotion (6 staff per unit on average). The comparability of the 1994 and 1996 data is increased by the overlap of the respondents in the two years (59%) and the very similar distribution by position within the units. Further support for the comparability of the two rounds of data collection comes from the positive feedback, both quantitative and qualitative, from health unit staff when reviewing their 1994 and 1996 scores.¹⁸

In this paper, the 1994 and 1996 implementation, predisposition and capacity scores are compared using paired t-tests of the differences in means. The relationships between the three constructs are also compared using nonparametric (Spearman) correlations.

TABLE I
Examples of the 74 Community Heart Health Activities*† Used to Derive a Total Implementation Score‡, by Setting

Activities designed to improve general heart health. Please indicate the current stage of development of each activity (including those carried out by agencies other than the health unit) in your community (area served by your health unit)....

Schools

- Educational materials on heart health in schools
- Recognition awards to schools with heart health programming (e.g., comprehensive school health approach)

Workplaces

- Health risk assessments of workers
- Small group sessions for behaviour change

Health Care Settings

- Training for primary care providers on assessing patient risk factors for cardiovascular disease
- Information for primary care providers for referring patients to community programs

Community at Large

- Media campaigns on heart health
- Advocacy directed at the provincial level for policies related to heart health

- * The examples in this table are activities to improve general heart health. Other risk factors included in the inventory are activities to reduce tobacco use, increase healthy eating and increase physical activity. The complete instrument is available from CHHIOP, Health Behaviour Research Group, MC6082, University of Waterloo, Waterloo, Ontario, N2L 3G1.
- † Primary sources for these items were a wide literature on community-based interventions.^{12,13} The conceptual framework for the inventory - i.e., risk factors, settings, intervention approach (e.g., education, environmental support, policy) - was adapted from the U.S. Public Health Service comprehensive approach to tobacco control¹⁴ and consistent with the Ontario Ministry of Health comprehensive approach to promoting heart health.²
- ‡ Calculated as the mean of 74 items, each rated on a five-point scale from not aware of any organized activity being planned or implemented to, a high level of implementation whereby the activity is at over 2/3 of full implementation (where full implementation is the optimal level of implementation if resources were not limited).

TABLE II
Examples of Organizational Practices* for Deriving Predisposition† and Capacity‡ Scores, by Category

Assessment Activities: Since January 1, 1996, our health unit...

- Reviewed information on local factors and conditions affecting heart health
- Reviewed heart health activities developed elsewhere that might be adopted or adapted for local use

Planning Activities: Since January 1, 1996, our health unit...

- Participated in a strategic planning process to set priorities for public health activities
- Set goals and objectives for promoting heart health

Activities to Support Implementation: Since January 1, 1996, our health unit...

- Recruited volunteers to assist with heart health activities
- Took advantage of resources outside of public health to support implementation of heart health activities

Evaluation Activities: Since January 1, 1996, our health unit...

- Collected and used information to guide development of heart health activities ("formative evaluation")
- Collected and used information to determine if heart health activities met outcome objectives (e.g., awareness, behaviour change)

- * Primary sources for these items were: literature on community organization;¹⁵ information on the U.S. process to develop performance indicators for public health;¹⁶ and a consultation process carried out with researchers, public health policy experts, and public health personnel in Ontario.
- † Calculated as the mean of 18 organizational practices, each rated on a four-point scale from not at all important to very important.
- ‡ Calculated as the mean of 18 organizational practices, each rated on a five-point scale from not aware that the activity was conducted to, the activity was conducted and was very effective.

TABLE III
Change in Average Implementation Score by Risk Factor and Setting (N=42)

Risk Factor (# of items)	Setting (# of items)				Total (74) (75)
	Schools '94 (16) '96 (16)	Workplaces (16) (17)	Health Care (10) (10)	Community (32) (32)	
Tobacco					
1994 (18)	1.8	1.7	1.7	2.7	2.1
1996 (18)	1.9	2.2*	2.0	2.9	2.4*
Nutrition					
1994 (24)	1.5	0.9	1.8	1.7	1.6
1996 (24)	1.8*	1.0	2.1*	1.8	1.7*
Physical Activity					
1994 (17)	1.4	1.2	0.9	1.6	1.4
1996 (17)	1.9*	1.6*	1.7*	1.8	1.8*
General Heart Health					
1994 (15)	1.1	1.5	1.2	1.4	1.3
1996 (16)	1.5*	1.4	1.5	1.6	1.5
Total					
1994 (74)	1.5	1.3	1.4	1.8	1.6
1996 (75)	1.8*	1.5*	1.8*	2.0*	1.8*

* $p < 0.05$ (2-tailed)

Scale: 0 - Not aware of any organized activity being planned or implemented

1 - Active planning

2 - Low level of implementation

3 - Medium level of implementation

4 - High level of implementation

TABLE IV
**Importance and Effectiveness of Public Health Practices
to Support Heart Health (N=42)**

Activity Area (# of items)	Average Importance Score	Average Effectiveness Score	Correlation Between Effectiveness and Importance
Assessment			
1994 (4)	3.5	1.8	.47*
1996 (4)	3.8*	2.8	.30
Planning			
1994 (6)	3.6	1.9	.48*
1996 (6)	3.8*	2.5*	.32
Support			
1994 (6)	3.3	1.6	.45*
1996 (6)	3.6*	2.1*	.38*
Evaluation			
1994 (2)	3.6	1.3	.21
1996 (4)	3.9*	1.9*	.23
Total			
1994 (18)	3.5	1.7	.44*
1996 (20)	3.8*	2.3*	.24

* $p < 0.05$ (2-tailed)

Scales:

Importance

1 - Not at all important

2 - Somewhat important

3 - Fairly important

4 - Very important

Effectiveness

0 - Not aware that activity was conducted

1 - Activity conducted, not very effective

2 - Activity conducted, somewhat effective

3 - Activity conducted, fairly effective

4 - Activity conducted, very effective

RESULTS

Implementation of heart health activities

Alpha coefficients for each risk factor and setting sub-scale for 1994 and 1996 (0.52 to 0.76) as well as for total implementation (0.75 and 0.74) indicated

acceptable to good internal consistency. The grand, row and column means (Table III) show a general, and in many cases significant, increase in the level of implementation overall and by risk factor and setting between 1994 and 1996. The overall mean increased from 1.6 to 1.8, values which fall between 'active planning' and 'low imple-

mentation'. There was a corresponding decrease (from 34% to 27%) in the percentage of activities for which no activity was reported for the two years.

The row means show variability in implementation by risk factor with the highest level for tobacco activities (2.1 and 2.4). The column means show less variability in implementation by setting, ranging from 1.8 and 2.0 (community) to 1.3 and 1.5 (workplaces). There is greater variability by specific risk factor/setting combinations, although it should be noted that the means are calculated for a small number of items in some cases. The range is from highs of 2.7 and 2.9 (tobacco-related activities in the general community) to lows of 0.9 and 1.0 (nutrition activities in workplaces, and physical activity in health care settings).

Predisposition and capacity

The four categories of organizational practice were all rated as important in both 1994 and 1996 (Table IV) with scores showing a consistent and significant increase. The sub-scales had acceptable to good internal consistency with alpha coefficients for 1994 and 1996 ranging from 0.53 to 0.88. The means ranged from 3.3 to 3.5 in 1994 to 3.6 to 3.9 in 1996. Variability across health units was low. These results indicate strong overall predisposition to implement heart health activities.

Alpha coefficients for the four effectiveness sub-scales for 1994 and 1996 ranged from 0.73 to 0.85, indicating good internal consistency. Mean scores in 1994 (Table IV) were low, both overall and for specific activity areas, with means ranging from 1.3 (evaluation) to 1.9 (planning). They fall between the 'not very effective' and 'somewhat effective' points on the scale. There was considerable variability in scores across the 42 units, with overall effectiveness ranging from 0.3 to 3.0. Scores show a marked and significant increase for 1996. The means range from 1.9 (evaluation) to 2.8 (assessment) with a corresponding increase overall (from 1.7 to 2.3).

Relationships between predisposition, capacity and implementation

Relationships hypothesized between predisposition, capacity and implementation (Figure 1) were analyzed using the indica-

tors described above. The total importance and effectiveness ratings were used for the correlations with implementation.

The results (Table IV) show significant relationships between predisposition and capacity for four of the five indices in 1994 and two of the five in 1996. Higher predisposition scores are associated with higher capacity scores. The weaker correlations in 1996 are most likely explained by the low variance in the high (close to maximum) importance ratings. Only 1 of 18 correlations between predisposition and implementation are significant (Table V) and this is on the margin of what is expected by chance at the 95% confidence level. Here again the low variance in the high importance ratings in both years is an important factor influencing the results.

There are moderate to strong relationships between capacity and implementation in both years (Table V) confirming that higher levels of implementation are associated with higher levels of capacity. By risk factor, the strongest relationships with capacity are for nutrition and general heart health activities. By setting, the correlation is strongest for workplace activities. There is also a marked consistency in the pattern of the correlations for the two years which provides support for the internal validity of the measures. The correlations may be inflated by the inclusion in the capacity measure of a sub-scale (i.e., activities to support implementation) which is closely linked to implementation, but as we have reported elsewhere,³ the relationship is corroborated for other indicators of capacity.

CONCLUSIONS

The findings show increases in implementation, capacity and predisposition related to heart health promotion in the 42 Ontario public health units between 1994 and 1996. The data were collected using comparable surveys completed by similar and overlapping respondent groups drawn from health unit management and staff. The increases are indicative of the cumulative effect of: the increased priority placed on heart health by the Ontario Ministry of Health through its mandatory guidelines for public health programmes;¹⁹ the con-

Implementation	Implementation and Importance		Implementation and Effectiveness	
	1994	1996	1994	1996
Risk Factor				
Tobacco	-0.04	0.23	0.36*	0.40*
Nutrition	0.18	0.23	0.55*	0.47*
Physical Activity	-0.05	-0.02	0.33*	0.27
General Heart Health	0.30	0.08	0.54*	0.42*
Setting				
Schools	-0.18	0.27	0.31*	0.48*
Workplaces	0.13	-0.07	0.68*	0.57*
Health Care	0.24	0.34*	0.34*	0.32*
Community	0.11	0.19	0.42*	0.35*
Overall	0.13	0.21	0.60*	0.51*

* $p < 0.05$ (2-tailed)

solidation of findings from Ontario's five heart health demonstration sites; activities of Ontario's evolving system to support community health promotion; and planning for a new province-wide funding programme to support community-based heart health promotion.

The prominence of tobacco activities is consistent with provincial resource allocation to public health departments in line with the 1994 Tobacco Control Act and the Ontario Tobacco Strategy.²⁰ Variability in implementation by risk factor/setting combinations may reflect their relative reach and impact and the targeting of diminishing resources. The changes in capacity scores imply increased involvement and experience of health unit staff in heart health promotion, especially in assessment and planning activities support-

ive of early stages of implementation. The fact that planning activities were judged as generally more effective suggests that heart health initiatives were in preliminary stages in most units. This is reinforced by the comparatively low scores for evaluation activities. High predisposition scores in both years imply that the primary constraints on implementation are related to capacity and not predisposition. This is further substantiated by the finding that heart health promotion was judged to be a medium or high priority in 40 units in 1994 and in all 42 units in 1996.

The results confirm hypothesized relationships between predisposition and capacity, and between capacity and implementation. No causal direction in the relationships can be inferred. Conceptually, reciprocal relationships are expected where-

by predisposition, capacity and implementation are mutually reinforcing.¹⁰ The relationship between predisposition and implementation is constrained by the low variance in predisposition which was high for all units, especially in 1996. In light of the quite low implementation scores, the result might also imply that predisposition is not a sufficient condition for implementation to occur in the absence of a well-developed capacity to implement heart health activities.

The findings of this descriptive study add to the growing literature on organizational capacity and predisposition to undertake (heart) health promotion⁵ and illustrate methods of measuring key constructs proposed in earlier work^{10,11} which have since been adapted for use in other CHHI provincial dissemination projects. Ongoing analysis, guided by the recent theoretical literature,^{4,6,7} is examining ecological influences on the changes in heart health promotion reported here using a combination of data from the SCAN surveys and from in-depth interviews conducted in selected health departments in 1995 and 1997. The findings inform public health practice in Ontario by providing feedback to all health departments on their levels of predisposition, capacity and implementation over time and relative to provincial averages; by identifying organizational practices that are most clearly tied to implementation of heart health activities; and by focussing the efforts of provincial organizations (e.g., resource centres) on interventions to enhance the capacity of local health departments to implement heart health promotion programmes.

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