

NOTE TO USERS

This reproduction is the best copy available.

UMI[®]

**ORGANIZATIONAL CAPACITY AND
DISSEMINATION PRACTICES FOR CHRONIC DISEASE
PREVENTION IN THE CANADIAN PUBLIC HEALTH SYSTEM**

Nancy Anna Hanusaik

**Joint Departments of Epidemiology, Biostatistics and Occupational Health
McGill University, Montreal**

June 2008

**A thesis submitted to McGill University in partial fulfillment of the
requirements of the degree of Doctor of Philosophy**

©Nancy Anna Hanusaik 2008



Library and Archives
Canada

Published Heritage
Branch

395 Wellington Street
Ottawa ON K1A 0N4
Canada

Bibliothèque et
Archives Canada

Direction du
Patrimoine de l'édition

395, rue Wellington
Ottawa ON K1A 0N4
Canada

Your file Votre référence
ISBN: 978-0-494-66300-4
Our file Notre référence
ISBN: 978-0-494-66300-4

NOTICE:

The author has granted a non-exclusive license allowing Library and Archives Canada to reproduce, publish, archive, preserve, conserve, communicate to the public by telecommunication or on the Internet, loan, distribute and sell theses worldwide, for commercial or non-commercial purposes, in microform, paper, electronic and/or any other formats.

The author retains copyright ownership and moral rights in this thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without the author's permission.

AVIS:

L'auteur a accordé une licence non exclusive permettant à la Bibliothèque et Archives Canada de reproduire, publier, archiver, sauvegarder, conserver, transmettre au public par télécommunication ou par l'Internet, prêter, distribuer et vendre des thèses partout dans le monde, à des fins commerciales ou autres, sur support microforme, papier, électronique et/ou autres formats.

L'auteur conserve la propriété du droit d'auteur et des droits moraux qui protègent cette thèse. Ni la thèse ni des extraits substantiels de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation.

In compliance with the Canadian Privacy Act some supporting forms may have been removed from this thesis.

While these forms may be included in the document page count, their removal does not represent any loss of content from the thesis.

Conformément à la loi canadienne sur la protection de la vie privée, quelques formulaires secondaires ont été enlevés de cette thèse.

Bien que ces formulaires aient inclus dans la pagination, il n'y aura aucun contenu manquant.

■ ■ ■
Canada

ABSTRACT

Introduction: The public health system is of central importance in efforts to reduce the burden of chronic disease, yet there are no national data on organizational capacity (OC) or dissemination practices pertaining to chronic disease prevention (CDP) programming in the public health system. The aim of this thesis is to investigate OC and dissemination practices within the Canadian public health system. Two new conceptual models pertaining to these constructs were developed, and a survey of all public health organizations across Canada engaged in CDP was conducted in 2004-5.

Method: Data were collected in telephone interviews with persons most knowledgeable about CDP programming in 77 “resource” organizations that develop and transfer CDP innovations to other organizations, and 216 “user” organizations that adopt and deliver CDP programs in specific populations. Reliable measures of the constructs of interest were developed using principal components analyses. Levels of OC, its potential determinants, and involvement in CDP programming were compared across three types of organizations and across Canada. In addition, levels of 13 dissemination-related practices were compared across organizations and independent correlates of dissemination were identified in multiple linear regression.

Results: Levels of skill and involvement were highest for tobacco control and healthy eating programming; lowest for stress management, social determinants of health, and program evaluation. Any notable differences in skill levels favoured central Canada. Resource adequacy was low overall; lowest in eastern Canada and within formal public health organizations. Supports for OC were highest in central Canada and in grouped organizations. Dissemination practices most heavily engaged in included: *Identification of barriers to adoption/implementation of the innovation, tailoring dissemination strategies and design of dissemination plan*. There was little coherence across organizations in the number or types of dissemination practices engaged in. *Skill at planning/implementing dissemination, external sources of funding, type of resource organization, attitude toward the process of collaboration, and user-centeredness* were all positively associated with dissemination ($R^2=0.42$; F value 8.20, $p<0.0001$).

Conclusions: These results provide a backbone for organizational research in public

health systems. Strengths and gaps identified in OC and dissemination practices will guide strategic investment in the public health system.

RESUMÉ

Introduction: Le système de santé publique est central à nos efforts collectifs visant la réduction des maladies chroniques, mais malgré ceci il n'existe aucune donnée d'envergure nationale portant sur la capacité organisationnelle (CO) ni sur les pratiques de dissémination (PD) ayant trait à la prévention des maladies chroniques (PMC) dans notre système de santé publique. L'objectif de ce mémoire est d'examiner la CO et les PD au sein du système de santé publique canadien. Deux nouveaux modèles conceptuels représentant les relations entre ces entités ont été développés et une enquête de tous les organismes de santé publique au Canada impliqués dans la PMC a eu lieu en 2004 - 2005.

Méthodes: Les données furent accumulées lors d'entrevues téléphoniques avec les personnes ayant le plus de connaissances pertinentes à la création de programmes de PMC dans 77 organismes «ressources» qui développent et transmettent des innovations en PMC à d'autres organismes, et avec 216 organismes «utilisateurs» qui adoptent et implantent les programmes de PMC dans des populations spécifiques. Des mesures fiables des concepts d'intérêt ont été développées lors d'analyses en composantes principales. Les niveaux de CO, les déterminants potentiels de CO, ainsi que les niveaux d'implication dans des programmes de PMC furent comparés à travers trois types d'organismes et à travers le Canada. De plus, les niveaux de 13 PD furent comparés entre organismes, et les variables indépendamment associées avec la dissémination identifiées par régression linéaire multiple.

Résultats: Les niveaux de compétence et d'implication étaient les plus élevés pour les programmes ayant trait au contrôle tabagique et à la saine alimentation et les plus bas pour ceux liés à la gestion du stress, aux déterminants sociaux de la santé, et à l'évaluation des programmes. Les différences au niveau des compétences étaient en faveur des régions du centre du Canada. La suffisance des ressources était peu élevée et était à son plus bas à l'est du pays, ainsi qu'à l'intérieur des agences reconnues de santé publique. Les différents soutiens à la CO étaient à leur plus élevé dans les régions du centre du Canada et dans les organismes de type coalition, partenariat ou réseau. Les PD les plus fortement utilisées étaient : *l'identification des barrières à*

l'adoption/implantation d'innovation, cibler les stratégies en dissémination et créer un plan de dissémination. Le nombre et le type de PD différaient grandement d'un organisme à l'autre. La compétence relative à la planification/ implantation de PD, des sources de revenu externes à l'organisme, le type d'organisme « ressource », l'attitude envers le processus de collaboration et des efforts centrés sur l'organisme utilisateur étaient des entités associées de façon positive avec la dissémination ($R^2=0.42$; valeur F 8.20, $p<0.0001$).

Conclusions: Les résultats obtenus pourront servir de base à la recherche organisationnelle au niveau des systèmes de santé publique. Les forces et faiblesses identifiées dans la CO ainsi que dans les PD pourront servir à guider des investissements stratégiques au niveau de notre système de santé publique.

CONTRIBUTION OF CO-AUTHORS

Manuscript 1: Building the backbone for organisational research in public health systems: development of measures of organisational capacity for chronic disease prevention

Nancy Hanusaik, Pdt, MSc, PhD Candidate: Designed the study and the analyses; Developed the questionnaire, conducted the data analysis; interpreted the data; wrote the manuscript integrating comments and suggestions from all co-authors; Addressed reviewers' comments.

Jennifer O'Loughlin, PhD. Professor, Department of Social and Preventive Medicine, University of Montreal; Centre de recherche du Centre hospitalier de l'Université de Montréal; Institut national de santé publique du Québec: Contributed to the design of the study and analysis; Contributed to the development of the questionnaire, interpretation of the data, and writing of the manuscript

Natalie Kishchuk, PhD. Natalie Kishchuk Evaluation & Research Inc: Contributed to the development of the questionnaire, interpretation of the data, and writing of the manuscript. Natalie Kishchuk conducted the pilot testing of the questionnaire.

John Eyles, PhD. Professor, School of Geography and Earth Sciences, McMaster University: Provided comments on the manuscript.

Kerry Robinson, MSc. School of Geography and Earth Sciences, McMaster University: Provided comments on the manuscript

Roy Cameron, PhD. Department of Health Sciences and Gerontology, University of Waterloo; National Cancer Institute of Canada, Centre for Behavioural Research and Program Evaluation, University of Waterloo: Provided comments on the manuscript

Manuscript 2: Organizational capacity for chronic disease prevention in Canada: Results of a national survey

Nancy Hanusaik, Pdt, MSc, PhD Candidate: Designed the study and the analysis; developed the questionnaire; conducted the data analysis; interpreted the data; wrote the manuscript integrating comments and suggestions from all co-authors.

Jennifer O'Loughlin, PhD. Professor, Department of Social and Preventive Medicine, University of Montreal; Centre de recherche du Centre hospitalier de l'Université de Montréal; Institut national de santé publique du Québec: Contributed to the design of the study and analysis; contributed to the development of the questionnaire, interpretation of the data, and writing of the manuscript.

Natalie Kishchuk, PhD. Natalie Kishchuk Evaluation & Research Inc: Contributed to the development of the questionnaire, interpretation of the data, and writing of the manuscript.

Gilles Paradis, MD, MSc, FRCPC. Professor, Joint Departments of Epidemiology and Biostatistics and Occupational Health, McGill University; Institut national de santé publique du Québec; McGill University Health Centre Research Institute: Participated in developing the questionnaire and provided critical review of the manuscript.

Roy Cameron, PhD. Department of Health Sciences and Gerontology, University of Waterloo; National Cancer Institute of Canada, Centre for Behavioural Research and Program Evaluation, University of Waterloo: Provided critical review of the manuscript.

Manuscript 3: A national survey of dissemination practices in chronic disease prevention organizations in Canada

Nancy Hanusaik, Pdt, MSc, PhD Candidate: Designed the study and the analyses, designed the questionnaire, conducted the pilot testing of the questionnaire, carried out the analyses, wrote the manuscript integrating comments and suggestions from all co-authors.

Jennifer O'Loughlin, PhD. Professor, Department of Social and Preventive Medicine, University of Montreal; Centre de recherche du Centre hospitalier de l'Université de Montréal; Institut national de santé publique du Québec: Contributed to the design of the study and analysis; Contributed to the development of the questionnaire, interpretation of the data, and writing of the manuscript

Gilles Paradis, MD, MSc, FRCPC. Professor, Joint Departments of Epidemiology and Biostatistics and Occupational Health, McGill University: Participated in the development of the questionnaire and provided critical review of the manuscript.

Natalie Kishchuk, PhD. Natalie Kishchuk Evaluation & Research Inc: Contributed to the development of the questionnaire, interpretation of the data, and provided critical review of the manuscript. Natalie Kishchuk participated in the pilot testing of the questionnaire.

ACKNOWLEDGEMENTS

There are many individuals who have contributed to the successful completion of this research. First, I would like to thank the members of my committee: Dr. Robert Platt who provided careful and thoughtful guidance through my analyses; Dr Gilles Paradis who over the years, first as my MSc non-thesis supervisor and now PhD co-supervisor, has been a consistent source of support, advice and insightful feedback. I am also indebted to Dr. Natalie Kishchuk who has been an unofficial member of my committee, providing superlative mentorship throughout this project. Finally, I cannot adequately acknowledge Dr. Jennifer O'Loughlin, my supervisor. Her seemingly unachievable standards of excellence have consistently challenged me to strive harder. Under her exceptional, patient, and unflagging tutelage, I have achieved something I never thought possible. It is a constant source of amazement how despite her own tremendous obligations she never fails to make time for her students.

I am deeply indebted to the late Andrés Petrasovits who, as Senior Advisor of the Heart Health/WHO Collaborating Centre within Health Canada, and Co-Director of Countrywide Integrated Noncommunicable Diseases Intervention, was tireless in his commitment to heart health and chronic disease prevention in this country and internationally. This project is directly a result of his vision.

I am grateful to my fellow students and colleagues for their support, counsel and cherished friendship: Yuko Kawasumi my study partner, Hela Makni, Tracie Barnett, Erika Dugas, and Marie-Pierre Sylvestre. Erika and Marie-Pierre are also to be acknowledged for their contributions to this research; Erika as an able interviewer and Marie-Pierre whose meticulous search of the Internet lead to the creation of our list of organizations. I thank our research assistant, Samara Dalfen and all the interviewers who were directly responsible for the high response rate of this survey. I thank Daniel Cournoyer for his assistance in designing the database for organizational contact information. I thank Nathalie Théorêt for her outstanding computing skills, kindness and friendship. Her expertise and creativity have been an integral part of every presentation I

have delivered, every table, figure, and document I have produced in these last seven years.

I am also tremendously grateful to my parents, Elizabeth and John, and my maternal grandmother, Anna Ličko, who instilled in me and in my sisters the value of education. Every project, assignment, concert, and ballet recital was supported. Our scholastic achievement was always a source of great pride. I extend my gratitude to my three sisters, Susan, Angela and Linda, whose love and support I never have to question and who have inspired me in the way they have sought and achieved their own goals; and to my nieces and nephew who have provided welcome distraction through out this process. They are a continued source of pride and joy.

Lastly, and most importantly, I wish to thank my husband, Gordon Rubin, whose love and encouragement have enabled me to pursue all my goals. I would never have had the courage to return to graduate studies had he not stood by me every step of the way. Despite the daily stresses of his busy medical practice, I can always count on his unfaltering sense of humor and ability to keep me focused on what really matters in life.

This thesis is dedicated to the memory of my father, John Hanusaik.

STATEMENT OF SUPPORT

The study was supported by a grant from the Canadian Institutes of Health Research. I am personally indebted to the Canadian Institutes for Health Research for a fellowship award that allowed me to pursue this thesis. I also gratefully acknowledge support from the Fonds de la recherche en santé du Québec and the Transdisciplinary Training Program in Public and Population Health Research (a program funded by the Canadian Institutes of Health Research Strategic Training Initiative in partnership with the Quebec Population Health Network).

STATEMENT OF ORIGINALITY

The project described in this thesis represents original research and uses original data collected in a survey conducted between October 2004 and April 2005 of the Canadian preventive health system. The national survey represented one component of a larger research program, entitled the Canadian Heart Health Dissemination Project (CHHDP). The CHHDP was a five-year, joint research program between McGill and McMaster Universities (1). It incorporated two distinct research programs in the areas of organizational capacity and dissemination. The McMaster component comprised a parallel, case study approach to synthesize learnings across nine provincial dissemination projects undertaken in the context of the Canadian Heart Health Initiative (CHHI)¹. Qualitative data were collected through documentary analysis and key informant interviews. The McGill component comprised the research reported herein. Jennifer O'Loughlin was a co-principal investigator of the CHHDP. I appropriated the survey component of the project which comprised two separate studies: (i) the Organizational Capacity Study; and (ii) the Dissemination Study. I developed the research objectives and designed the survey with input from the research team. I was responsible for conceptualizing and undertaking the census of all organizations involved in chronic disease prevention across Canada. I designed the models that drove this research and prepared the first versions of the survey instruments measuring the concepts described in these models. I participated extensively in the instrument revision process (final item selection, response set selection, pilot testing, formatting). I organized the translation of both survey instruments. I supervised data collection for the survey, trained the interviewers, worked with the software company to design the data management system, oversaw data entry, and verified each data entry for accuracy. I designed the specific objectives for each manuscript, analyzed the data, wrote the manuscripts, incorporated co-authors' comments and addressed the reviewers' comments for the first manuscript (the other two manuscripts are, at this time, under review).

¹ The CHHI was a 15 year program of research initiated by the CVD Prevention Unit (Health Canada). CHHI brought together researchers and public health leaders in each province to conduct research that would inform CVD prevention policies and practices, i.e. to strengthen the capacity of the public health system to develop and deliver heart health interventions at the community level. The Initiative comprised four phases: 1) Policy development; 2) Provincial heart health surveys; 3) Demonstration phase and 4) Dissemination phase (2).

This research has made important original contributions to research on organizational capacity for chronic disease prevention (CDP) and dissemination of innovations. The three conceptual models developed to guide this research organize and synthesize the disparate literatures in these areas. They provide conceptual clarity and help position the two primary studies that comprise this thesis in the innovation development-dissemination-utilization continuum. The measures developed herein offer researchers measurement tools and reliable measures that did not exist before this research. To my knowledge, this thesis provides the first empirical data describing organizational capacity and dissemination in the Canadian public health system. The combined findings of these two studies contribute to our understanding of the associations between organizational capacity and its determinants and outcomes, and between dissemination and the correlates of dissemination.

PUBLICATIONS ARISING FROM THIS WORK

Hanusaik N, O'Loughlin JL, Kishchuk N, Eyles J, Robinson K, Cameron R. Building the backbone for organisational research in public health systems: development of measures of organisational capacity for chronic disease prevention. *J Epidemiol Community Health*, 2007; 61:742-749.

Hanusaik N, O'Loughlin J, Kishchuk N, Paradis G, Cameron R. Organizational capacity for chronic disease prevention in Canada: Results of a national survey. Under review at *Health Reports*.

Hanusaik N, O'Loughlin J, Paradis G, Kishchuk N. A national survey of dissemination practices in chronic disease prevention organizations in Canada. Under review at *Social Science & Medicine*

TABLE OF CONTENTS

ABSTRACT.....	i
RESUMÉ	iii
CONTRIBUTION OF CO-AUTHORS.....	v
ACKNOWLEDGEMENTS	viii
STATEMENT OF SUPPORT	x
STATEMENT OF ORIGINALITY	xi
PUBLICATIONS ARISING FROM THIS WORK.....	xiii
TABLE OF CONTENTS	xiv
LIST OF TABLES	xvii
LIST OF FIGURES	xix
LIST OF APPENDICES	xx
ABBREVIATIONS.....	xxi
CHAPTER 1: INTRODUCTION.....	1
1.1 BURDEN OF CHRONIC DISEASE.....	1
1.2 PUBLIC HEALTH SYSTEM IN CANADA	3
1.3 PREVENTIVE HEALTH SYSTEM IN CANADA.....	5
1.4 NEED FOR ‘SYSTEMS THINKING’ IN PREVENTIVE HEALTH SYSTEMS RESEARCH	5
1.5 FORMAT OF DISSERTATION.....	6
CHAPTER 2: LITERATURE REVIEW	7
2.1 INVESTIGATING ORGANIZATIONAL CAPACITY FOR CDP PROGRAMMING IN THE PREVENTIVE HEALTH SYSTEM	7
2.1.1 Defining organizational capacity for CDP.....	7
2.1.2 Lack of validated quantitative measures of organizational capacity ...	9
2.1.3 Lack of representative data on levels of organizational capacity for CDP	9
2.1.4 Need for ‘systems thinking’ in organizational capacity research.....	10
2.2 DISSEMINATION OF CDP PROGRAMS	10

2.2.1	Investigating dissemination in the preventive health system	11
2.3	SUMMARY OF GAPS IN KNOWLEDGE ON ORGANIZATIONAL CAPACITY AND DISSEMINATION.....	12
2.4	CONCEPTUAL MODELS DEVELOPED TO GUIDE THIS RESEARCH	12
2.4.1	Objects of Dissemination	12
2.4.2	Existing models of innovation dissemination and utilization.....	13
2.5	NEW CONCEPTUAL MODELS DESIGNED FOR THIS RESEARCH .	16
2.5.1	Conceptual Model for the Development, Dissemination and Utilization of Innovations in the Preventive Health System	16
2.5.2	Conceptual Model of Organizational Capacity for CDP	19
2.5.3	Conceptual model for Dissemination of CDP Innovations from Resource to User Organization(s).....	21
CHAPTER 3: OBJECTIVES		29
CHAPTER 4: METHODS		31
4.1	STUDY DESIGN.....	31
4.1.1	Overview	31
4.1.2	Ethical approval and informed consent	31
4.1.3	Creation of the survey frame	32
4.1.4	Eligibility criteria	33
4.1.5	Recruitment of organizations and key informants	34
4.1.6	Recruitment of organizations and key informants into the reliability sub-study	37
4.2	DEVELOPMENT OF SURVEY INSTRUMENTS.....	38
4.2.1	Translation.....	39
4.3	DATA COLLECTION.....	40
4.3.1	Interviews.....	40
4.3.2	Inter-rater reliability interviews.....	40
4.3.3	Data management	40
4.4	ORGANIZATIONAL CAPACITY STUDY	41
4.4.1	Study population	41
4.4.2	Development of the Organizational Capacity Study survey instrument.....	41
4.4.3	Study variables for Organizational Capacity Study	42
4.4.4	Statistical methodology.....	46
4.5	DISSEMINATION STUDY.....	54
4.5.1	Study population	54
4.5.2	Development of the Dissemination Study survey instrument.....	54
4.5.3	Study variables for the Dissemination Study	55
4.5.4	Statistical methodology.....	57

CHAPTER 5: RESULTS	64
5.1 PREAMBLE MANUSCRIPT 1.....	64
5.2 MANUSCRIPT 1	66
5.3 PREAMBLE MANUSCRIPT 2.....	87
5.4 MANUSCRIPT 2	88
5.5 PREAMBLE MANUSCRIPT 3.....	108
5.6 MANUSCRIPT 3	109
CHAPTER 6: METHODOLOGICAL CONSIDERATIONS.....	140
6.1 THREATS TO INTERNAL VALIDITY	140
6.1.1 Confounding bias	140
6.1.2 Information or measurement bias	141
6.1.3 Selection bias	146
6.2 EXTERNAL VALIDITY	148
6.3 STUDY DESIGN.....	149
CHAPTER 7: CONCLUSION.....	150
7.1 SUMMARY OF THE WORK AND FINDINGS.....	151
7.2 IMPLICATIONS FOR RESEARCH	154
7.3 IMPLICATIONS FOR PUBLIC HEALTH	155
REFERENCES.....	156

LIST OF TABLES

CHAPTER 2: LITERATURE REVIEW

- Table 2.1: Selected models of planned change contributing to the conceptualization of dissemination practices within resource organizations
- Table 2.2: Practices comprising the dissemination process within resource organizations

CHAPTER 4: METHODS

- Table 4.1: Informant to item ratio for principal components analyses in the Organizational Capacity Study
- Table 4.2: Informant to item ratio for principal components analyses in the Dissemination Study

CHAPTER 5: RESULTS

- Table 5.1: Selected characteristics of the study population (n = 216)
- Table 5.2: Description of measures of organizational capacity, and of potential determinants and outcomes of organizational capacity, including psychometric properties of scales developed
- Table 5.3: Inter-rater reliability of measures of potential outcomes of organizational capacity (n = 17 pairs of raters)
- Table 5.4: Spearman rank correlation coefficients between indicators of organizational capacity and potential determinants of organizational capacity (n = 216)
- Table 5.5: Characteristics of organizations engaged in chronic disease prevention and healthy lifestyle promotion in Canada according to provincial grouping and type of organization
- Table 5.6: Levels of organizational determinants (organizational supports, partnerships) of organizational capacity for chronic disease prevention and healthy lifestyle promotion in Canada according to provincial grouping and type of organization

- Table 5.7: Levels of organizational capacity for chronic disease prevention and healthy lifestyle promotion in Canada according to provincial grouping and type of organization
- Table 5.8: Levels and intensity of involvement in chronic disease prevention and healthy lifestyle promotion in Canada according to provincial grouping and type of organization
- Table 5.9: Characteristics of resource organizations (n=77) engaged in dissemination of innovations related to chronic disease prevention, in Canada
- Table 5.10: Proportion of resource organizations heavily engaged in specific dissemination practices by type of organization
- Table 5.11: Mean DISSEMINATION scores across categories of potential correlates, and parameter estimates of potential correlates obtained in the simple linear regression models using DISSEMINATION as the dependent variable
- Table 5.12: Unstandardized regression coefficients (95% confidence intervals) for variables retained as independent correlates of dissemination in multivariate linear regression (n=75)

CHAPTER 6: METHODOLOGICAL CONSIDERATIONS

- Table 6.1: Comparison of selected characteristics of participating and non-participating organizations

CHAPTER 7: CONCLUSION

- Table 7.1: Summary of key findings regarding organizational capacity and dissemination

LIST OF FIGURES

CHAPTER 1: INTRODUCTION

Figure 1.1 Commonality of risk behaviors across chronic diseases

CHAPTER 2: LITERATURE REVIEW

Figure 2.1 Conceptual model of the development, dissemination and utilization of innovations in the preventive health system

Figure 2.2 Conceptual model of organizational capacity for CDP

Figure 2.3 Conceptual model of dissemination of CDP innovations from resource to user organization(s)

CHAPTER 4: METHODS

Figure 4.1 Multi-stage pre-interview contact protocol

Figure 4.2 Description of selection of eligible organizations into the survey

Figure 4.3 Conceptual model of organizational capacity for CDP with study variables

CHAPTER 5: RESULTS

Figure 5.1 Conceptual framework depicting potential determinants and outcomes of organisational capacity for CDP/HLP

LIST OF APPENDICES

- APPENDIX 1:** Certificate of ethics approval – McMaster University
- APPENDIX 2:** Certificate of ethics approval – McGill University
- APPENDIX 3:** Introductory letter
- APPENDIX 4:** Screening questionnaire
- APPENDIX 5:** Organizational Capacity study questionnaire - Survey of Organizations Involved in CDP/HLP (Interviewer Version)
- APPENDIX 6:** Description of study variables – Organizational Capacity study
- APPENDIX 7:** Organizational Capacity study questionnaire items and corresponding factor loadings following varimax rotation
- APPENDIX 8:** Dissemination study questionnaire - Resource Organization Questionnaire (Interviewer Version)
- APPENDIX 9:** Description of study variables – Dissemination study
- APPENDIX 10:** Dissemination study questionnaire items and corresponding factor loadings following varimax rotation
- APPENDIX 11:** Reprint of Manuscript #1
- APPENDIX 12:** Copyright Waiver/Release Forms

ABBREVIATIONS

Abbreviation	In plain language
AB	Alberta
BC	British Columbia
CDP	Chronic disease prevention
CDP/HLP	Chronic disease prevention/healthy lifestyle promotion
CHHDP	Canadian Heart Health Dissemination Project
CHHI	Canadian Heart Health Initiative
CI	Confidence interval
CVD	Cardiovascular disease
FTE	Full time equivalent
GEE	Generalized Estimating Equation
GO	Grouped organization
HIV/AIDS	Human Immunodeficiency virus/Acquired Immune Deficiency Syndrome
ICC	Intra-class correlation coefficient
MB	Manitoba
NB	New Brunswick
NGO	Non-governmental organization
NF	Newfoundland and Labrador
NS	Nova Scotia
OC	Organizational capacity
ON	Ontario
OR	Odds ratio
PAF	Population-attributable fraction
PCA	Principal components analysis
PE	Prince Edward Island
PHO	Formally mandated public health organization
PHU	Public health unit
QC	Québec
SD	Standard deviation
SDH	Social determinants of health, Manuscript #1
SDOH	Social determinants of health
SK	Saskatchewan
SL	Source language
TL	Target language

CHAPTER 1: INTRODUCTION

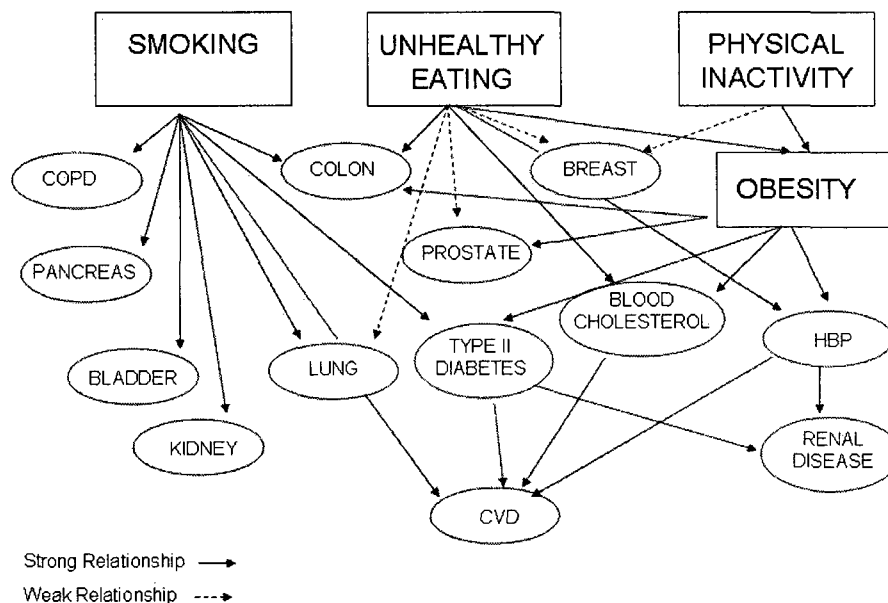
About 60% of all deaths worldwide are attributable to non-communicable chronic diseases (3), most notably cancers, cardiovascular diseases, diabetes, and chronic respiratory illnesses. In Canada, these diseases account for at least 70% of deaths and more than \$93 billion annually in direct health care and indirect productivity costs (4). As the population ages and the burden of chronic disease in the population and on health system resources increases, there is growing recognition of the need for prevention through comprehensive and integrated action. The public health system is of central importance to this prevention effort and it is crucial to ensure that this system has adequate capacity (5,6) and that effective health promotion and chronic disease prevention (CDP) programs are in place (7) to address this burden.

1.1 BURDEN OF CHRONIC DISEASE

One of the consequences of our changing demographics (i.e. declining birth rate, longer life expectancy and aging population (8)) is the increasing incidence and prevalence of these chronic health problems (i.e., cancer, cardiovascular diseases, diabetes, and chronic respiratory illnesses). Greater numbers of people are living into their 8th and 9th decades of life with one or more of these chronic conditions, placing long-term demands on our health care system. An already large public health burden will continue to grow in the coming years with unprecedented implications for individuals, their families and our society as a whole (9,10).

These increasingly prevalent and costly chronic conditions are linked by common modifiable lifestyle risk factors (11). Tobacco use, prolonged unhealthy nutrition, physical inactivity and their consequences (i.e., obesity, hypertension, hypercholesterolemia and impaired glucose tolerance) are the major causes of these conditions. Figure 1.1 depicts the commonality of these risk behaviors across chronic diseases, as well as the interrelationships between these diseases (12).

Figure 1.1 Commonality of risk behaviors across chronic diseases



Recent estimates indicate that these risk factors are very prevalent and that the prevalence of most risk factors is increasing. Fifty-one percent of Canadians are physically inactive (13), 23% are obese with a body mass index ≥ 30 (8), 27% have high blood pressure (14), and 26% have high blood cholesterol levels (15). Although the prevalence of smoking has declined over the past few decades, 19% of Canadians aged 15 and over are current smokers (16). Consumption of fruits and vegetables is below suggested intake levels, and foods not part of the four food groups provide 26-29% of energy (17). Sixty-five percent of Canadians report more than one risk factor for chronic disease (18).

Population-attributable fractions (PAF) have been calculated to estimate the proportion of chronic disease in Canada that could theoretically be prevented by eliminating these risk behaviors. For physical inactivity (19) and obesity (20) the PAFs range from 11% to 36% and 4% to 51%, respectively. Similarly, elimination of smoking would have a major

impact on cancer and CVD rates (21,22), and the incidence of cancer would decrease with daily diets high in non-starchy vegetables and in fruits (23).

Preventing these chronic diseases, or at least postponing their development to later decades of life, requires interventions aimed not only at the major risk factors, but also at the environmental, economic, and social determinants of chronic disease in the population. These social and environmental risk factors come under the collective label of ‘determinants of health’ or ‘social determinants of health’ and include such things as the social and physical environment in which people live, the economic conditions of society, and the accessibility and quality of the health care system (24).

Despite progress in treating these conditions and in the pharmacological control of risk factors such as hypertension and hypercholesterolemia, the chronic disease burden cannot be addressed entirely within the curative health system. Relying exclusively on treatment of chronic diseases at the individual level to improve health overall in Canada will have little impact on the chronic disease burden (25,26). To meet population health needs, health policy formulation for the prevention of chronic disease has necessarily assumed a higher priority over the past several decades. This recognition of the need for comprehensive and integrated population-wide preventive action to address the chronic disease burden puts our public health system squarely in focus. However, there are few empirical reports that describe the public health system in Canada.

1.2 PUBLIC HEALTH SYSTEM IN CANADA

In contrast to clinical medicine, which targets the individual to detect and treat disease, the essence of public health is that it aims to prevent disease in populations (25,27). Public health services target the environment or the community, and the programs, services and institutions within the public health system aim to prevent disease and

promote health in the population as a whole. Essential or “core” functions² include: population health assessment, health surveillance, health promotion, disease and injury prevention and health protection (28). Exceptionally, preventive services target individuals in vulnerable groups including, among others, maternal and child health care programs.

A recent review (29) suggests that the Canadian public health system might best be described as a “grouping of multiple systems with varying roles, strengths and linkages”. Frank *et al* underscored earlier observations (28) of important regional and inter-provincial disparities in capacity to address public health problems, which may, in turn, relate to differences in health across regions. Although CDP is a key function of the public health system (30), it is unknown whether these purported disparities in public health capacity relate to differential levels of organizational capacity for CDP (defined herein as skills and resources required for effective CDP programming) and/or actual levels of CDP programming in Canada. We know very little about: (i) the segment of the public health system engaged in primary chronic disease prevention and healthy lifestyle promotion, (defined herein as the preventive health system); (ii) the structure, resourcing, and functioning of the preventive health system; (iii) the impact of the CDP programs, practices, campaigns, and activities on population health; or (iv) how CDP programs are disseminated (or transferred from one organization to another) within the preventive health system so that “best practices” to address primary prevention of chronic disease can be widely implemented. It is also not clear to what extent programming addressing the social determinants of health (SDOH) exists within the system and if recommendations stemming from the Ottawa Charter for Health Promotion (31) regarding adoption of multi-level interventions that combine complementary environmental and behavioural components and span multiple settings, have been implemented in preventive health system programming.

² There is no accepted list of essential functions for the Canadian public health system. This list was suggested by the Advisory Committee on Population Health (2002) based on a literature review and a survey of key informants within and outside the public health system of Canada.

1.3 PREVENTIVE HEALTH SYSTEM IN CANADA

Although the primary component organizations of the preventive health system lie in the formal public health system infrastructure (i.e. and include among others, departments/agencies/units within the regional health authorities mandated by the provincial/territorial governments to carry out essential public health functions) other types of organizations outside this formal infrastructure also provide public health services and are involved in CDP programming. These organizations that are part of the “informal public health system” are an essential part of the preventive health system and include among others, national health charities and their provincial chapters, other nongovernmental and non-profit organizations, and grouped organizations such as coalitions, partnerships, alliances, and consortia. These organizations are characterized by wide diversity in mission, structure, and funding.

1.4 NEED FOR ‘SYSTEMS THINKING’ IN PREVENTIVE HEALTH SYSTEMS RESEARCH

Like many systems involving different functions and stakeholders, the public health system is not frequently considered as a whole by researchers, and the problems existing within this system are usually only viewed in parts (32). Because it helps focus on complex issues and complex relationships between groups in a more holistic fashion, systems thinking is gaining attention in health research (33). The preventive health system is a complex, multi-sector, multi-organizational system and in order to see the ‘bigger picture’ in terms of organizational capacity and dissemination of CDP programs to address the chronic disease burden, we need to adopt a ‘systems thinking’ approach in our research.

1.5 FORMAT OF DISSERTATION

The overall objective of this research is to investigate the distribution and determinants of organizational capacity and dissemination practices within the segment of Canadian public health system that is engaged in primary prevention of chronic disease, termed herein as the preventive health system. This dissertation is written in the style of a manuscript-based thesis. It consists of a collection of three manuscripts that report on a single program of research that develops knowledge on organizational capacity and dissemination in the Canadian preventive health system. Connecting chapters provide additional details not included in the manuscripts which have been drafted to respect specific journal guidelines. While efforts have been made to avoid redundancy in the main text, the connecting chapters, and the manuscripts, it is a feature of this style of thesis that some redundancy is unavoidable. Chapter 2 of this thesis presents a comprehensive review of the literature on organizational capacity and dissemination as it pertains to CDP in the public health system. The challenges of undertaking research in the areas of organizational capacity and dissemination are described and the gaps in knowledge that are addressed in this thesis are summarized. An important sub-section of the second chapter is devoted to reviewing the literature that informed the development of the three conceptual models used to guide this research. This literature review concludes with a description of these three new models. Chapter 3 presents the specific objectives of this research. Chapter 4 provides a detailed description of the methodology used in this study. The three manuscripts are presented in the results chapter (Chapter 5), each introduced by a brief preamble. Chapter 6 discusses the relevance of selected methodological issues that are of general concern in epidemiological research to this current research project. Finally, Chapter 7 provides a summary of the findings of the thesis work and concludes with implications of this work in terms of future research and public health planning.

CHAPTER 2: LITERATURE REVIEW

The purpose of this chapter is to review the literature on organizational capacity and dissemination as it pertains to CDP in the public health system (i.e., the preventive health system). Specifically, the challenges facing research on organizational capacity and dissemination are detailed, and the gaps in knowledge that are addressed in this thesis are summarized. An important sub-section of this chapter is devoted to the literature that informed the three conceptual models that were developed to guide this research.

2.1 INVESTIGATING ORGANIZATIONAL CAPACITY FOR CDP PROGRAMMING IN THE PREVENTIVE HEALTH SYSTEM

Research investigating if organizations that deliver CDP programs have adequate capacity to effectively reduce the burden of chronic disease burden has encountered at least three notable challenges. First, despite growing interest in this area, there is no widely accepted definition of organizational capacity in the public health context. Second, there is a lack of validated quantitative measures of organizational capacity and third there are no nationally representative data on levels of organizational capacity in the preventive health system (i.e. the organizations within the public health system with mandates for CDP).

2.1.1 Defining organizational capacity for CDP

Organizational capacity has been defined variably in the literature, borrowing from definitions used in research on practitioner capacity (34) and/or community/organizational capacity-building for health promotion (35-42). Within the public health context, Hawe *et al* (43) conceptualized organizational capacity for health promotion (i.e., the ‘capacity of an organization to tackle a particular health issue’) as having at least three domains: organizational commitment, skills, and structures. Labonte and Laverack (40) described government/non-governmental organizational capacity as the structures, skills, and resources required to deliver programs that are responsive to specific health problems. Within the CVD prevention/heart health promotion domain,

organizational capacity to conduct effective health promotion programs has been conceptualized as a set of skills and resources (44). This definition was expanded to include knowledge (45) and commitments (46). Others (47) have adopted the Singapore Declaration definition of organizational capacity (48) as the capability of an organization to promote health, formed by the will to act, infrastructure, and leadership. Finally, Naylor et al (49) included infrastructure, collaboration, an evidence-base, and policy and technical expertise as components of a capable organization. Overall, skills and resources to conduct CDP programs emerge in this literature as the two most commonly cited dimensions of organizational capacity in the public health context.

An issue related to lack of conceptual clarity is that, while substantial efforts have been made to identify dimensions of organizational capacity, few investigators have formulated clear conceptual boundaries between organizational capacity, its determinants, and its outcomes. In their surveys of Ontario public health units (PHUs) in 1994 and 1996, Elliott et al (50) and Taylor et al (44) distinguished between predisposition (i.e., level of importance ascribed to public health practices supportive of heart health initiatives), capacity (i.e., effectiveness in performing these practices), and implementation of heart health activities. This conceptual framework posited that capacity and predisposition are interrelated, and that these, in turn, relate to implementation. In empirical testing of the framework, there were moderate correlations between predisposition and capacity, moderate-strong correlations between capacity and implementation, but no correlation between predisposition and implementation. Building on this framework, Riley et al (51) undertook path analysis using the same database to examine the relationships between levels of implementation of heart health activities in 1997 and four sets of possible determinants of implementation: internal organizational factors; external system factors; predisposition; and capacity. The results supported a strong direct relation between capacity and implementation, and provided evidence that external system factors (i.e., partnerships, support from resource centres) and internal organizational factors (i.e., coordination of programs within the health unit) have indirect impact on implementation by influencing capacity. Predisposition was not retained in the model. Priority given to heart health within PHUs had a direct relationship with

implementation. In 2001, McLean et al (46) proposed that the relation between organizational capacity and heart health promotion action is mediated by external factors such as the availability of funding, the policy frameworks of provincial and national governments, and public understanding of health promotion. However their analysis did not reflect this conceptualization - external factors was treated as one of four indices of organizational capacity, rather than as mediators.

2.1.2 Lack of validated quantitative measures of organizational capacity

A second challenge for researchers investigating organizational capacity is the lack of validated quantitative measures of organizational capacity, its possible determinants and its outcomes. Qualitative work has predominated in this area, and although informative in terms of rich descriptive and locally meaningful information, qualitative research does not lend itself to generalization across organizations and jurisdictions. Quantitative work is needed to support qualitative work, and to provide decision-makers with standardized tools for measuring, monitoring, managing, and improving CDP capacity. Measures of organizational capacity developed to date often include large numbers of very diverse items in an effort to capture all possible dimensions of capacity. Although content validity is reported to be high for most measures (52), data on construct validity and reliability is limited, and few investigators have formally tested the psychometric properties of their measures (53,54).

2.1.3 Lack of representative data on levels of organizational capacity for CDP

A third challenge is that there are no nationally representative data on levels of organizational capacity in organizations with mandates for CDP. Such data are needed to guide evidence-based investment in building preventive health systems, and in particular to identify gaps and monitor changes in capacity over time. To date, surveys have been restricted to include only formally mandated public health organizations in specific geographical regions, with the exception of one survey that included both formally mandated public health organizations and other community agencies (i.e., recreation departments, women's centres, worksites, etc.) involved in heart health promotion (45).

Comparison across surveys is impeded because of the differing operational definitions of organizational capacity.

2.1.4 Need for ‘systems thinking’ in organizational capacity research

While previous reports describe capacity for, or effectiveness in, achieving outcomes in specific types of organizations involved in public health, there are no reports that provide systematic comparisons of capacity across the different types of organizations. For example, several studies assess the performance or effectiveness of public health units or agencies in carrying out mandated activities or recommended core public health functions (55-61). Others focus on the relationship between member- and/or organizational-level characteristics and impacts/outcomes in community-based coalitions (62-67) or on coalition sustainability (64,68). Previous studies examining organizational capacity for CDP have also been limited in the interpretation and generalizability of results because the sample was restricted to include only one type of organization (44,46-47) or organizations in one province only (69).

Organization capacity within the informal public health system has rarely been studied. In heart health promotion (70-72) and in non-CDP areas such as HIV (73-76), much of the research has focused on describing the development of organizational capacity in coalitions or community-based organizations. No study to date has examined differences in capacity between the many different types of organizations that comprise the preventive health system.

2.2 DISSEMINATION OF CDP PROGRAMS

Many promising CDP programs fail to have impact because plans or activities to disseminate these programs across public health organizations are not well-developed or well-implemented (77-79). While definitions vary, dissemination as defined herein is a deliberate planned process to transfer an innovation (i.e., a program, practice, policy, practice aid) from an organization that produced the innovation (herein termed “resource organization”) to organization(s) that will adopt and implement the innovation (herein

termed “user organization”) (80-81). This process is in contrast to diffusion, a passive, unplanned spread of an innovation (82) which is largely ineffective in influencing public health practice (83-84).

Despite a growing literature that views dissemination as crucial to effective CDP programming (79,85-86), little is known about how dissemination occurs within the preventive health system. Furthermore, few studies describe specific practices that comprise the dissemination process from the perspective of the resource organization, and there are no systematic studies that identify factors associated with comprehensive dissemination.

2.2.1 Investigating dissemination in the preventive health system

Efforts to describe the dissemination process in public health organizations are challenged on at least five levels. First the literature in this area is widely dispersed across disparate disciplines (i.e., agriculture, social sciences, business administration, education, health sciences) and inconsistently indexed in electronic databases, making synthesis of information and comparison across studies difficult. Second, research on dissemination has involved many types of diverse innovations including concepts, technologies, practices, practice tools, programs, a wide variety of resource and user populations, and different units of analyses. Third, there is no consensus on the definition of “dissemination,” or on how much of the innovation development, transfer, uptake, and utilization continuum should be included under this rubric. Uptake and utilization (often conceptualized as adoption and implementation) that occurs within user organizations can be included in dissemination definitions along with the earlier stages of innovation development and transfer generated by resource organizations (87,77). Other dissemination definitions refer to activities occurring solely within user entities (88). Fourth, qualitative work has predominated in this area, and as mentioned previously, qualitative research does not lend itself to generalization across organizations or jurisdictions. Quantitative work is needed to develop standardized tools for measuring, managing, and improving dissemination efforts by public health organizations. Finally, most of the literature focuses on the recipients of dissemination efforts (i.e. user

organizations) and on the determinants of innovation adoption and implementation. There are few models of dissemination that focus on resource organizations.

2.3 SUMMARY OF GAPS IN KNOWLEDGE ON ORGANIZATIONAL CAPACITY AND DISSEMINATION

There are major gaps in knowledge on organizational capacity for CDP and dissemination practices in the preventive health system related, in part to the lack of widely accepted, well-grounded conceptual models, as well as the lack of consensus on definitions, and of reliable measurement instruments. Increasing our understanding of the levels and determinants of organizational capacity and dissemination is critical to improving the effectiveness of preventive health services in this country.

2.4 CONCEPTUAL MODELS DEVELOPED TO GUIDE THIS RESEARCH

The purpose of sections 2.4 and 2.5 is to present a review of the literature that informed the development of the three conceptual models guiding this research. Section 2.4 begins with a brief description of what constitutes the objects of dissemination and utilization (i.e., the innovations). This is followed by a description of the four existing models of dissemination and utilization from Havelock's seminal work (89). Section 2.5 describes the three new conceptual models developed in the context of this thesis project.

2.4.1 Objects of Dissemination

The object of dissemination is an innovation which may be an idea, practice or object that is new or perceived as new by potential users (90). The innovation can take many different formats including, among others, a policy, program, campaign, a technology, software, practice guidelines, practice aids, or published research. A more abstract innovation could be a new paradigm, such as for example, a "population approach" prevention strategy which seeks to modify the chronic disease risk profile of entire groups of people, at a community or population level (25).

2.4.2 Existing models of innovation dissemination and utilization

The following sections review Havelock's categorization of four principal schools of thought on dissemination and utilization. These are presented as "existing models" contributing to the conceptualization of my own new models. Existing models include: (i) the Research Development and Dissemination model; (ii) the Social Interaction model; (iii) the Problem Solver model; and (iv) the Interaction model.

2.4.2.1 Research, Development and Diffusion Model

The Research, Development and Diffusion model emphasizes the activities of a resource organization. This model depicts three phases along the continuum that exists from innovation development to innovation dissemination to innovation utilization. These phases include: research, development, and dissemination. The phases in the Research, Development and Diffusion model are initiated by the resource organization based on a presumed user need. The user is a large, clearly defined target group that is assumed to be essentially passive and will accept the innovation if it is delivered in an appropriate package at an appropriate point in time. The model depicts a one-way series of activities from resource to user. Evaluation is considered a part of every phase. Planning and division of labor are key features. Finally the model assumes high initial development costs prior to any dissemination activity. Advocates of this model do not necessarily assume a linear process from Research to Development to Dissemination, but the model suggests that the process occurs in a logical sequence of activities during which an innovation is developed, piloted with a "test" user group, packaged and disseminated to the user. The Research, Development and Diffusion model has been criticized as being over-rational, over-idealized, excessively research oriented, and inadequately user-oriented. There are many variations of this model and adoption of the innovation, although considered a user activity, is sometimes included in some variations.

2.4.2.2 Social Interaction Model

The focus of the Social Interaction model is on the process of adoption, implementation and institutionalization of an innovation by a user organization. The model depicts the stages an organization progresses through as it makes the decision to adopt and

implement the innovation. The five-stage process as it pertains to organizations includes: (i) agenda-setting (i.e., a perceived need is defined); (ii) matching specific problems with available innovations (i.e., fitting the perceived problem with an innovation); (iii) redefinition (i.e., the innovation is re-invented to accommodate the organization's needs and the organization's structure is modified to fit the innovation); (iv) clarification (i.e., the innovation starts to become imbedded in the organizational structure and any uncertainty regarding the innovation is clarified); and (v) routinization (i.e., innovation becomes incorporated into the regular activities of the organization, losing its separate identity) (91). Although the user needs are determined exclusively by the resource organization, the process by which the innovation is made available (i.e., stages of research, development and dissemination occurring within the resource organization) is not addressed in this model. The key to adoption of innovations is the social interaction among members of the user group, organization, or system. This model has received a lot of attention in the literature and could be considered the dominant paradigm.

2.4.2.3 Problem Solver Model

The focus of the Problem Solver model is on the efforts within user organizations to solve a particular problem. Although the user may be able to find a solution to a perceived problem, this model is primarily concerned with situations when assistance from an outside resource, termed "change agent" or "change planner", is utilized. The process can be initiated by the user or the change agent but the user must desire the change necessary to solve the problem and must participate fully in its solution. Whereas the user in the Research, Development and Diffusion and Social Interaction models is passive, the user in the Problem Solver model is very actively involved. The relationship between the change agent and the user is one of collaboration. Phases in the process that are commonly described include: problem awareness, diagnosis and formulation of the need as a problem to be solved, identification and search for resources relevant to the problem, planning for implementation, installation and evaluation, stabilization, and possible diffusion to other groups. Havelock (89) considered this model to exhibit similar elements to the development phase of Research, Development and Diffusion model. In that model, the creation of an innovation requires that developers seek out a "pilot" user

group and collaborate with this group in the testing and redesign process of that innovation. Very little empirical research has been conducted based on this approach. The model has been criticized as placing too much emphasis on the problem-solving capability of the user and the user's particular internal context and not enough on the spread of innovations to other groups who may have similar problems.

2.4.2.4 Interaction Model

The *interaction model* or the “linkage model” as it was termed by Havelock (89), was developed to address the criticisms of all previously reviewed models and incorporates important features from each. The model emphasizes the importance of interaction and collaboration between resource organizations and users. In this model, resource organizations and users are jointly involved in every step of the dissemination and utilization process, from initial design of the innovation to its adoption and implementation. Linkage is seen as a series of two-way interaction processes which connect user systems with resource systems. Through this linkage, the resource system gains appreciation for the user's internal needs and problem-solving patterns, and the user gains appreciation for the processes occurring within the resource system. This model addresses the “two communities” metaphor, which suggests that a great divide exists between resource and user cultures leading to lack of communication and consequently underutilization of innovations (92-93).

2.4.2.5 Summary of “existing” of dissemination and utilization

The four “existing models” of dissemination and utilization reviewed include: (i) the Research Development and Dissemination model; (ii) the Social Interaction model; (iii) the Problem Solver model; and (iv) the Interaction model. The first three models describe distinct perspectives along the continuum that exists from innovation development to innovation dissemination to innovation utilization. The last model synthesizes perspectives across the other three models. Specifically, the Research Development & Dissemination model describes the perspective of the resource system, the Social Interaction model describes the user system perspective and the Problem Solver model brings primary focus on the user system, but introduces the notion of a change agent or

resource from outside the user system. The Interaction model introduces the concept of linkage between the resource and user systems.

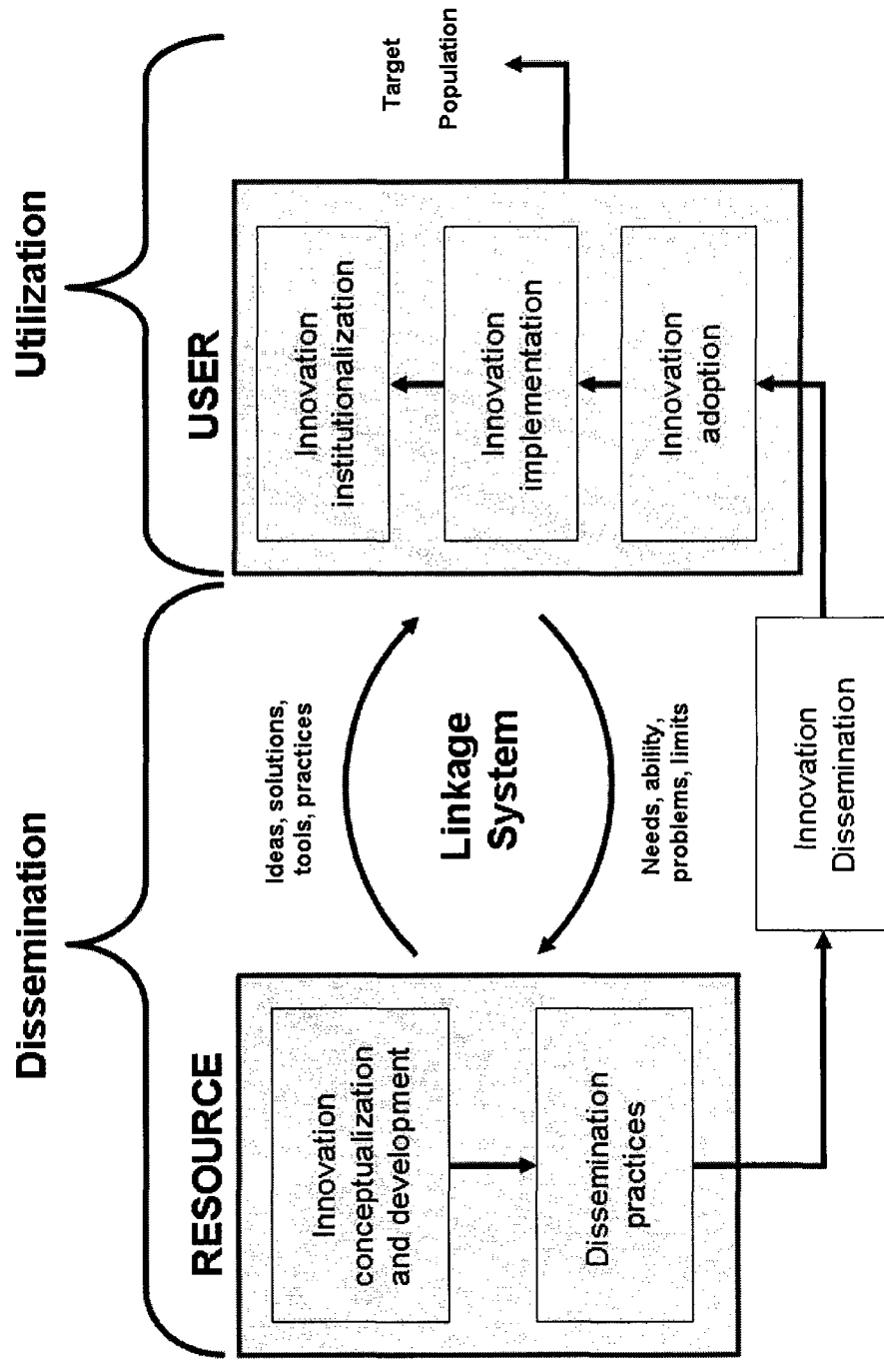
2.5 NEW CONCEPTUAL MODELS DESIGNED FOR THIS RESEARCH

The following sections present the three conceptual models developed to guide my research on organizational capacity for CDP programming and dissemination of CDP innovations. These models include: (i) the **Conceptual Model for the Development, Dissemination and Utilization of Innovations in the Preventive Health System**; (ii) the **Conceptual Model of Organizational Capacity for CDP**; and (iii) the **Conceptual Model of Dissemination of CDP Innovations from Resource to User Organization(s)**.

2.5.1 Conceptual Model for the Development, Dissemination and Utilization of Innovations in the Preventive Health System

This new model draws heavily on the interaction or *linkage* model (Section 2.4.2.4) that was first proposed by Havelock (89) and later expanded by Kolbe & Iverson (94), Orlandi and colleagues (95-96), and Orlandi (97). Figure 2.1 depicts the entire innovation development-dissemination-utilization continuum and the three systems that are involved as an innovation progresses from development to dissemination to utilization (i.e., adoption and implementation).

Figure 2.1 Conceptual model of the development, dissemination and utilization of innovations in the preventive health system



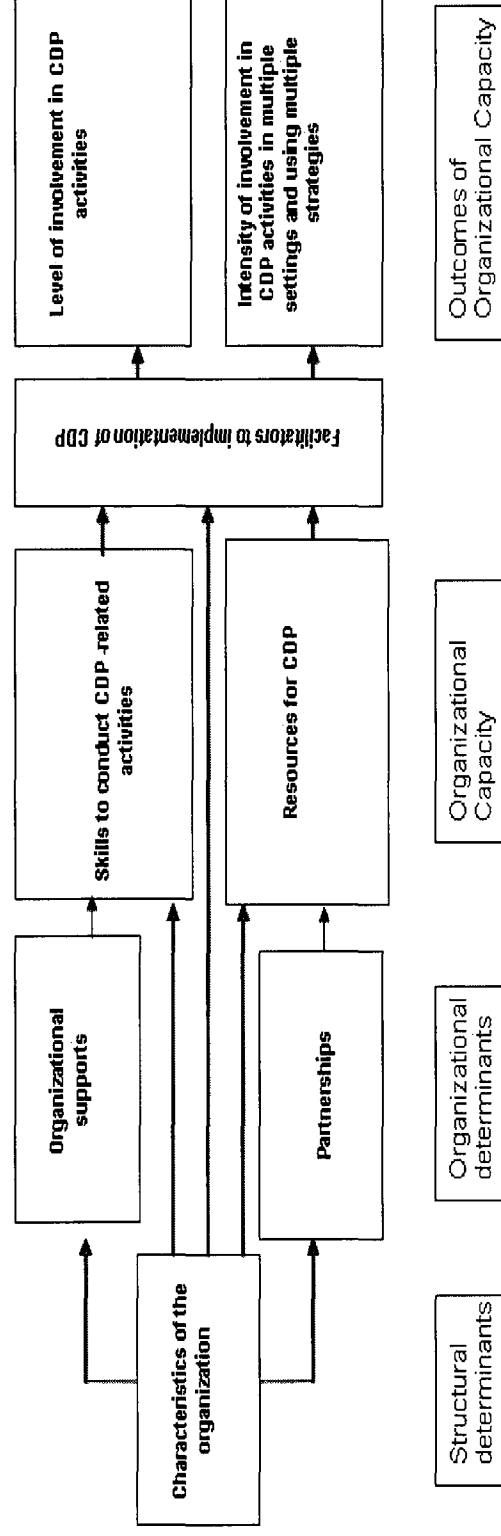
The three systems depicted are the resource system, the user system and a linkage system between the resource and user systems. In this model, the resource system is the agency or organization that develops and disseminates CDP innovations. This system could be a university research group, a government department, a para-governmental agency, a resource centre, a public health department, a coalition of agencies/organizations, or a non-governmental organization. The user system includes organizations that will adopt and implement the innovation in a specific target population, and eventually institutionalize the innovation into ongoing programming. Institutionalization is crucial from a public health perspective since attainment of health goals requires maintenance of interventions that extend far beyond the adoption decision (98). The user system might comprise school boards, communities, public health departments, health care organizations and other private and public entities whose clients will benefit from these CDP programs. The linkage system comprises representatives of both the resource and user systems with or without the addition of intermediaries such as change agents who facilitate collaboration or who may be in positions to influence changes necessary to support adoption and implementation (96,99). The primary function of a linkage system is to create a structure or means for the exchange of knowledge and ideas between those developing an innovation (the resource system) and those who will use the innovation (the user system) (100). The linkage system serves a dual purpose: to enable collaboratively developed user-relevant programs and to influence adoption and implementation by allowing the resource system to incorporate information on potential barriers/facilitators into dissemination strategies. Although this model depicts a linear pathway from innovation dissemination to utilization, the process does not necessarily occur in a linear fashion.

2.5.2 Conceptual Model of Organizational Capacity for CDP

The conceptual model underlying the organizational capacity study (Figure 2.2) attempts to clarify concepts in a literature that is predominately qualitative. This clarification was necessary to facilitate measurement of key concepts while adopting an approach suitable for empirical testing of the model. The development of this model began with a parsimonious conceptualization of user organizational capacity that comprises skills and resources for CDP programming. Skills and resources are the two most common dimensions of organizational capacity in the public health context (Chapter 2, page 9). A simple input/output model was designed to: (i) separate factors purportedly related to creating capacity into organizational and structural determinants of capacity; structural determinants being characteristics of the organization that would be expected to impact organizational skills and resources for CDP and organizational determinants being separated into internal (organizational supports) and external (partnerships) supporting practices/processes for capacity development/maintenance; (ii) postulate links between capacity and outcomes of capacity and (iii) position facilitators as mediators between capacity and outcomes. Although there are many potential outcomes of capacity, level of involvement in CDP programming is the outcome of most interest in this model. Facilitators are presented in the model, but are not addressed in this thesis.

In summary, this model posits that greater levels of organizational capacity will lead to greater involvement in CDP programming defined herein as practices, activities, and programs addressing tobacco control, healthy eating, physical activity, the social determinants of health (SDOH), and stress management.

Figure 2.2 Conceptual model of organizational capacity for CDP



2.5.3 Conceptual model for Dissemination of CDP Innovations from Resource to User Organization(s)

This section begins with a review of the literature that supports my conceptualization of the practices that comprise the dissemination process and the potential correlates of dissemination. The section concludes with the description of my model.

2.5.3.1 Review of the literature on dissemination practices

The conceptualization of the practices that comprise the dissemination process drew on the literatures describing the two “existing models” on dissemination and utilization presented in sections 2.4.2.2 and 2.4.2.3, namely the Social Interaction and the Problem Solver models. Several authors (78,100-102) describe phases undertaken by change agents as they try to alter the structure and/or functioning of a user system (usually termed “the client”) to address its perceived needs or problems. Table 2.1 compares the models of planned change proposed by these authors. The utilization literature has also informed the conceptualization of dissemination practices by describing factors that may influence adoption and implementation of innovations by user organizations. These factors include: (i) users’ perceptions of the attributes of the innovation being developed; (ii) the characteristics of the user organization; (iii) the relationship between resource and user organization(s); and (iv) the method or strategy used to disseminate.

Table 2.1 Selected models of planned change contributing to the conceptualization of dissemination practices within resource organizations

Author/Year	Phases of Planned Change					
	Unfreezing	Moving	Freezing			
• Lewin 1947	Development of need for change	Diagnosis of client system's problem	Establishment of goals and intentions of action	Transformation of intentions into actual change efforts	Generalization & stabilization of change	Achieving a terminal relationship
• Lippitt et al 1958	Establishment of change relationship	Client identification	Innovation (change program) design	Examination of alternative routes and goals	Selection of general strategies or approaches	Selection of Tactics (specific activities)
• Rich & Zaltman 1978	Change team development	Problem definition	Set performance objectives for program use	Specification of objectives	Identification of barriers to adoption, implementation	Design diffusion plan
• Bartholomew et al 2001	Identification of potential users of the health promotion program	Develop a linkage system				
• Caburnay et al 2001	Establish evidence for program effectiveness	Identify organizations to adopt program		Assess unique needs /characteristics of these organizations	Adapt the program to meet these needs	Develop program implementation and training materials to facilitate adoption
						Provide a plan for continuous program improvement and evaluation

Users' perceptions of the innovation: Studies inspired by Rogers' diffusion of innovation theory (103,90-91) have concentrated on the importance of objective or perceived attributes of an innovation by potential users (80,104-106). Attributes identified as having a positive impact on successful utilization include: 1) compatibility with the activities, objectives, and values of the user organization; 2) relative advantage over current practice; 3) simplicity of the innovation or ease of understanding the innovation and its implementation; 4) observability or degree to which results or impacts of an innovation are observable to others; 5) trialability or opportunity to experiment with the innovation on a limited basis; 6) flexibility or degree to which an innovation can be sub-divided and offered as separate components, or can be adapted for use in a wide variety of situations and still be effective.

Characteristics of user organizations associated with adoption/implementation of innovations: Characteristics of the user organization likely to influence the adoption/implementation of an innovation include: 1) the degree of formalization of tasks (i.e., the degree to which a user organization emphasizes following rules and procedures) (107-108); 2) organizational climate (80,109-110); 3) the types of clients served; 4) organizational capacity to deliver the innovation (human and financial resources, intervention skills), motivation, physical facilities (105,110-112); and 5) centralization or dispersion of power (113). Additionally, several other factors are positively associated with successful implementation of innovations by user organizations and include: visible support of the innovation among leaders (114); presence of a champion who supports and promotes the innovation (98,105,111), experience with innovations similar or related to the one in question (115) and existence of a department/unit/team that specializes in the field of the innovation (106,111).

Relationship between resource and user organization(s): The existence of linkages between resource and user organizations contributes to effective program transfer and uptake (95-96). A linkage system should be established at the beginning of program planning since it aids developers at every stage of the dissemination process and provides the user system with a means of expressing needs, expectations, and limitations of the innovation being developed (89,94,96, 100). There are several ways in which a linkage system can be organized, with varying degrees of formality (100).

Method or strategy used to disseminate: Strategies used by resource organizations to transfer innovations are critical to adoption/implementation by users (77). Landry et al (116) in their survey of 1229 Canadian social science researchers demonstrated that dissemination efforts by innovators represent a good predictor of use of research in several social science disciplines (OR=3.7, $p<0.01$). The literature highlights a wide range of dissemination strategies including: workshops and training programs emphasizing experiential learning and supervised practice; print communication with a high degree of specificity and operational description; communication through new information technologies; use of external consultants or knowledge brokers; early involvement of influential users in the planning and development of the innovation; technical assistance and developmental support to assure users have capacity to adopt and implement innovations (77). Dissemination strategies have been the focus of two recent systematic reviews in cancer control and health service organization dissemination research. Although there was no strong evidence to recommend any one dissemination strategy as effective (83,117), tailoring of different strategies to different demographic, structural and cultural features of users was supported (118). The value of personal contact has been reported (119-120) as well as the importance of being proactive, and using different techniques and channels simultaneously (100,109,121) to promote “purposeful redundancy” (89).

Summary of conceptualization of a comprehensive dissemination

Comprehensive dissemination was conceptualized in this thesis as comprising nine practices that collectively describe activities intended to improve the outcome of dissemination, which is generally viewed as the adoption and implementation of innovations by user organizations. Specifically these practices address the users' perceptions of the innovation, the characteristics of the user organization, the relationship between resource and user organizations, and the method or strategy used to disseminate the innovation. Dissemination practices do not necessarily need to take place sequentially, although decisions about or results of one activity could have direct effects on other activities (94). The nine dissemination practices include: identification of the need for the innovation; development of a linkage system; collaboration between resource and user organizations; identification of barriers/facilitators to the adoption and implementation of the innovation by the user organization(s); selection of strategies to overcome barriers or promote facilitators; design of a dissemination plan; enhancement of user capacity to adopt and implement the innovation; fidelity to the dissemination plan, evaluation of the dissemination process (Table 2.2).

2.5.3.2 Review of the literature on potential correlates of dissemination

There is limited guidance in the literature on potential correlates of the dissemination process occurring within the resource organization. The list of potential correlates tested in this thesis stems from Havelock's synthesis of the dissemination and utilization literatures (1971) and Huberman's "dissemination effort model" (109). The seven types of variables relating to dissemination studied herein include: (i) user-centeredness of dissemination efforts (i.e., the extent to which the resource organization takes users needs into account); (ii) the age, size and type (i.e., referred to summarily as "structure") of resource organization; (iii) the openness or orientation toward dissemination (i.e., readiness to be influenced by user feedback and new scientific knowledge; renewal of skills); (iv) organizational capacity (i.e., skills and resources) to undertake dissemination; (v) incentives to disseminate (i.e., reward for investment in dissemination activities in terms of dollars, recognition by colleagues, knowledge, self-esteem, satisfaction in

creating something that works, feedback from a satisfied client, feeling of job well done); (vi) organizational flexibility to adjust dissemination efforts in the face of a multi-sectoral user context); and (vii) organizational commitment to dissemination (i.e., number and diversity of resource people who gain access to the user; persistence of leadership for dissemination).

2.5.3.3 New Conceptual Model of Dissemination of CDP Innovations from Resource to User Organization(s)

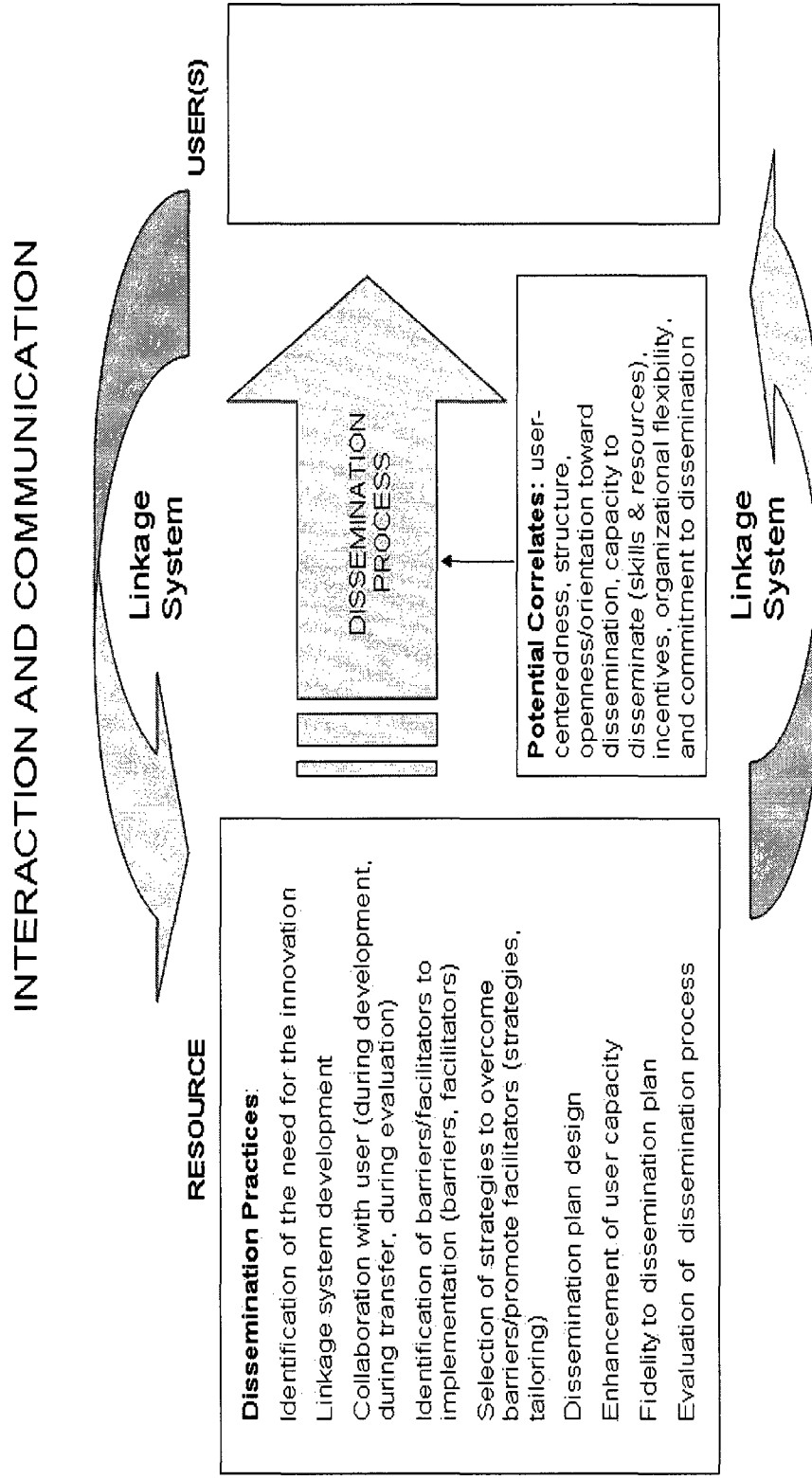
Figure 2.3 describes a new conceptual model of the dissemination of CDP innovations from resource to user organizations. The model depicts the resource organization as the entity that conceptualizes and develops innovations with the intent to disseminate these to targeted user organizations that then adopt and implement them in a specific population. The nine practices depicted in the model comprise the process of dissemination. The resource organization and the user organization(s) are situated in the context of two-way exchange (89,92-93,95-96,109), which emphasizes (i) the importance of interaction between producers and users in developing innovations that are relevant to users and the populations they serve, as well as in designing dissemination plans that will result in successful adoption, implementation, and institutionalization; and (ii) developing a linkage system or a structure or means to exchange knowledge and ideas (95-96). Theoretically at least, linkage helps developers at every stage of the dissemination process by allowing users a means or process to express needs, expectations and potential limitations of the innovation (89,94,96).

The actual process of adoption and implementation of the innovation by user organizations is not detailed in this framework because the focus of my work in this dissertation is on the dissemination process which occurs in resource organizations. Also the framework assumes that the innovations transferred have been evaluated and found to be effective.

Table 2.2 Practices comprising the dissemination process within resource organizations

Dissemination Practice	Objective
Identification of the need for the innovation	To identify the need for the innovation with the user organization
Development of a linkage system	To develop a system to provide insight into the culture and practices of the user organization and to enhance interaction between the resource and user organizations during the dissemination process
Collaboration between resource and user organization(s)	To collaborate with user organization(s) to develop an innovation that is relevant and to promote adoption and implementation.
Identification of barriers/facilitators to the adoption and implementation of the innovation by the user organization(s)	To identify potential barriers/failure points and facilitators to adoption, implementation within the user organization. These barriers/facilitators can be at different levels (individual or organizational).
Selection of strategies to overcome barriers and promote facilitators	To identify approaches to deliberately influence and improve effectiveness of transfer, i.e. to promote adoption and implementation by the user organization. Tailoring strategies to different demographic, structural and cultural features of users, personal contact and multi-operational approaches is stressed.
Design of a dissemination plan	To outline timeline and resources (financial and human) needed for innovation transfer
Enhancement of user capacity to adopt and implement the innovation	To assure user capacity (skills, resources) can support successful adoption and implementation of the innovation
Fidelity to the dissemination plan	To implement the dissemination plan as outlined above
Evaluation of the dissemination process	To evaluate process and outcome of transfer. This does not include monitoring and evaluation of the implementation or delivery of the innovation in the target population served by the user organization

Figure 2.3 Conceptual model of dissemination of CDP innovations from resource to user organization(s)



CHAPTER 3: OBJECTIVES

The overall aim of this thesis was to investigate the distribution and determinants of organizational capacity and dissemination practices within the Canadian preventive health system. Herein the Canadian preventive health system is conceptualized as the segment of the public health system engaged in primary prevention of chronic disease and healthy lifestyle promotion. This segment includes all national-, provincial-, and regional-level organizations engaged in primary prevention of diabetes, CVD, chronic respiratory disease, and cancer and/or promotion of healthy eating, non-smoking, and physical activity. This thesis uses original data collected in a survey of the Canadian preventive health system conducted October 2004 to April 2005. The specific objectives were as follows:

- Based on a new conceptual model, to develop reliable quantitative measures of organizational capacity for CDP, as well as measures of its structural and organizational determinants, and its principal outcome (i.e., involvement in programs aimed at the primary prevention of chronic disease)
- To describe the characteristics of the organizations that comprise the Canadian preventive health system
- To describe levels of organizational capacity, its determinants and its outcomes in western, central, and eastern Canada and across three types of organizations (i.e., formal public health organizations; non-governmental organizations; and grouped organizations including coalitions, partnerships, alliances and consortia)
- Based on a new conceptual model of the process of dissemination, to develop reliable quantitative measures of dissemination and its potential correlates

- To describe levels of dissemination practices across three types of organizations in the Canadian preventive health system
- To identify the independent correlates of dissemination in organizations engaged in CDP in Canada

CHAPTER 4: METHODS

This chapter presents a detailed description of the methods used in this thesis. The two main studies that comprise this thesis (i.e., one on organizational capacity and the other on dissemination) and a reliability sub-study were conducted within the context of one national survey, and therefore share methodologies. More specifically, because the study design and data collection methods were common across studies, a general description of these features is presented with study-specific departures from the common methodology highlighted. The development of study variables and the statistical analyses used in each study is described separately.

4.1 STUDY DESIGN

4.1.1 Overview

Data were collected in a national telephone survey conducted between October 2004 and April 2005, in all regional, provincial and national public health organizations across Canada that are engaged in CDP programming.

4.1.2 Ethical approval and informed consent

The survey was part of a larger research program entitled the Canadian Heart Health Dissemination Project, which received ethics approval from the Research Ethics Board of McMaster University, Hamilton, Ontario, Canada (Appendix 1: Certificate of ethics approval, McMaster University). The study was approved by the Institutional Review Board of the Faculty of Medicine, McGill University, Montréal, Québec, Canada. The certificate of ethics approval is included in Appendix 2. All potential participating organizations received a letter of introduction describing the survey and assuring confidentiality (Appendix 3). Participation in the survey constituted informed consent.

4.1.3 Creation of the survey frame

To identify a complete and up-to-date list of organizations in the preventive health system, we undertook a complete census of all regional, provincial, and national organizations in the ten provinces across Canada, with mandates for the primary prevention of chronic disease (i.e., diabetes, cancer, CVD or chronic respiratory disease) and/or promotion of healthy eating, non-smoking, or physical activity. This mandated programming had to target whole populations or large groups and address single or multiple risk factors in any age group. The following types of organizations were identified in an exhaustive Internet search, supplemented by information from key contacts (i.e., provincial CHHI investigators with in-depth knowledge of CDP activity in their respective provinces) across Canada: government departments, regional health authorities, public health units/agencies, non-governmental organizations (NGOs) and their provincial/regional divisions, para-governmental health agencies, resource centres, professional organizations, and coalitions, alliances and partnerships.

A type of purposive sampling known as snowball sampling or network sampling (122) was used to establish the comprehensive, province-specific list of CDP organizations. This involved: (i) initial enumeration of organizations known to be involved in CDP activities (i.e., CDP-specific departments within Health Canada, provincial ministries of health, and regional-level public health services, and the chronic disease-specific national health charities and their provincial branches); (ii) follow-up of 'links to additional resources' on these initial organizational websites to identify the names of other types of organizations; (iii) follow-up of these organizational website links to identify other organizations and so on until new organizations could no longer be identified using this procedure; (iv) identification of other organizations using Google™ (i.e., organizations with a focus on a specific disease (i.e., diabetes, cancer, CVD, chronic respiratory illness or integrated chronic disease focus) or specific risk factor (i.e., smoking, healthy eating, physical activity); (v) verification of mission statements and/or mandates of each organization identified in this search to ascertain whether or not programming for primary prevention was within their mandate. If there was insufficient information to

determine involvement in primary prevention, organizations were included on the list in order to be screened for eligibility at a later point in the process. Key words used throughout this Internet search included: Canada; British Columbia; Alberta; Saskatchewan; Manitoba; Ontario; Quebec; New Brunswick; Nova Scotia; Prince Edward Island; Newfoundland; heart health; regional health authority, regional health district, public health unit, public health services, public health agency, cardiovascular disease/health; hypertension; stroke; cholesterol; cancer; diabetes; chronic respiratory disease; emphysema; chronic obstructive pulmonary disease; chronic disease; physical activity; nutrition; tobacco control; sports and recreation; prevention; primary prevention; population health; wellness; healthy lifestyle; community health; and health promotion.

Because there were major differences in mandates and resourcing, organizations that targeted primarily aboriginal populations were excluded. This exclusion was extended to all organizations located in the three territories where the proportion of the population that is aboriginal is high. Because the total number of organizations was small, sampling was not considered, and a complete census of all organizations was undertaken to assure a large enough number of organizations to enable meaningful analyses. Key contacts validated the province-specific lists of organizations identified in the Internet search, for accuracy and completeness. All 353 organizations identified were invited to participate in the study.

4.1.4 Eligibility criteria

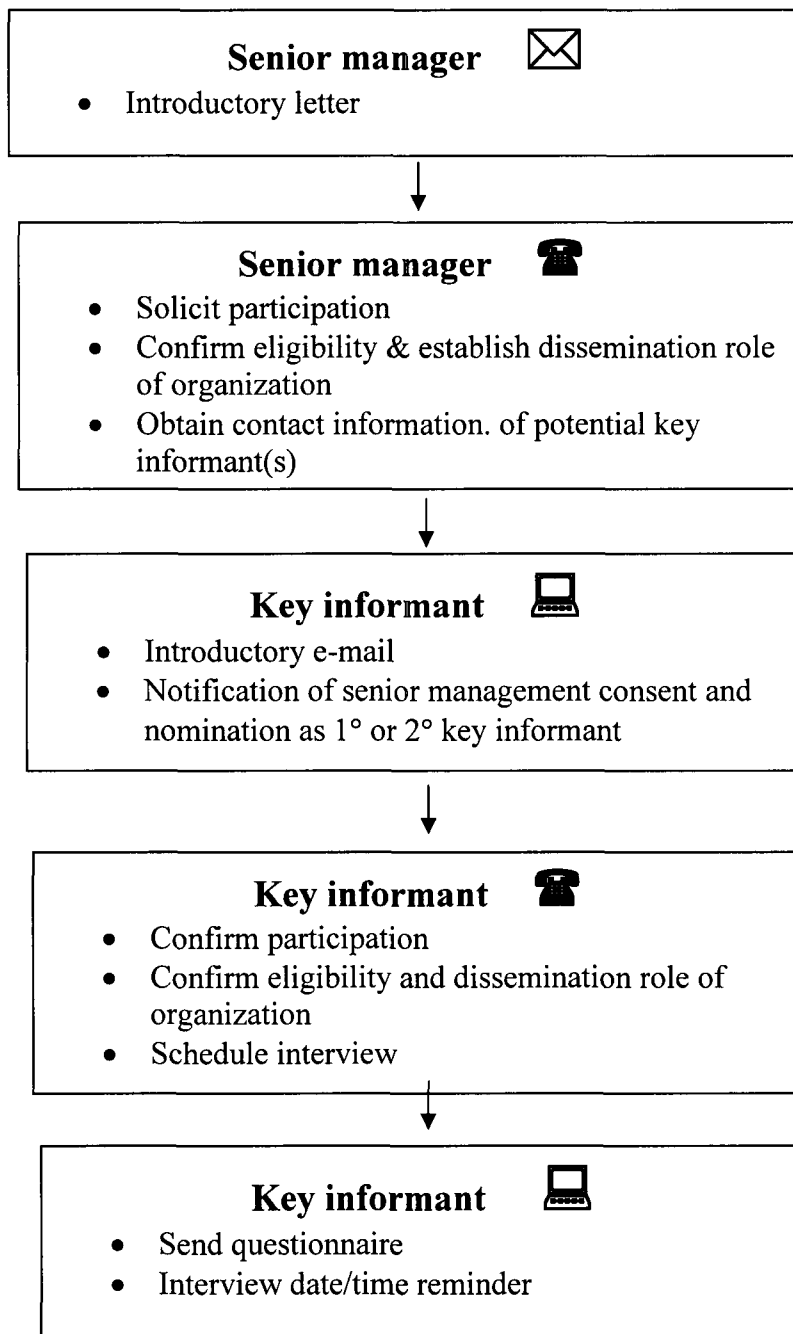
An organization was eligible for inclusion in the survey if it: (i) was primarily involved in primary prevention of chronic disease; and (ii) was involved in developing/adopting programs, practice tools, skill or capacity-building initiatives, campaigns, activities, etc. for the primary prevention of chronic disease; (iii) had transferred these innovations to other organizations in the past three years or had implemented the innovations in a specific target population. The term “organization” refers to an entire organization (if the organization as a whole conducted CDP activities) or a specific department, unit or branch within an organization (if only certain divisions undertook CDP activities). For example, if within a large formal public health organization, a single unit was mandated

to undertake healthy lifestyle programming, that unit was designated as an “organization” and included in the census.

4.1.5 Recruitment of organizations and key informants

A multi-stage process was used to contact organizations, confirm their eligibility and solicit participation (Figure 4.1). A personalized letter signed by the principal investigator was mailed to a senior manager in each of the 353 organizations. The letter explained the study objectives and indicated that the senior manager would be contacted by telephone in the near future (Appendix 3). Within one to two weeks after receipt of the introductory letter, senior managers were telephoned to confirm that the organization met the inclusion criteria, and if so, to solicit participation, and to obtain contact information for the individual within the organization who was most knowledgeable about CDP activities. CDP activities were those associated with implementation of CDP programs in specific populations and/or dissemination of CDP innovations from one organization to another. The individual (i.e., the potential key informant) was then emailed a copy of the introductory letter (Appendix 3). He/she was informed of: (i) the organizational consent to participate in the survey and his/her nomination as potential key informant by senior management; and (ii) future telephone contact by a survey team member. The potential key informant was telephoned one week later to confirm his/her participation, to review eligibility of the organization to participate, and to schedule an interview.

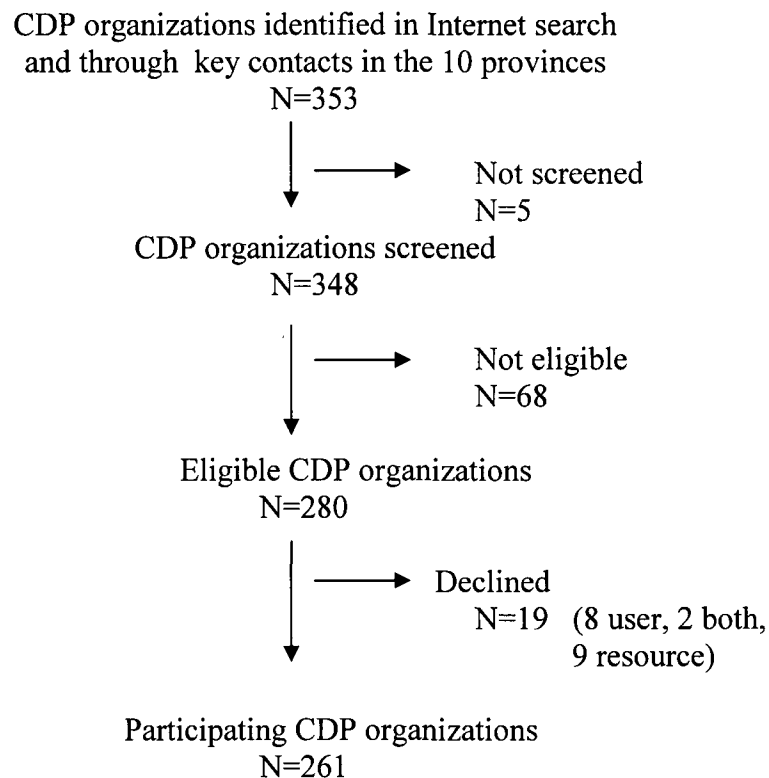
Figure 4.1 Multi-stage pre-interview contact protocol



Based on screening interviews with senior management, organizations that adopted or developed CDP programs or innovations with the intent to deliver them in specific populations (i.e., organizations directly involved in front-line CDP programming) were categorized as “user organizations”. These organizations participated in the Organizational Capacity Study. Those that developed and disseminated CDP innovations to other organizations, without the intent to implement these innovations in specific populations, were categorized as “resource organizations”. These organizations participated in the Dissemination Study. Those that claimed a dual “user” and “resource” function were categorized as “both” and participated in both the Organization Capacity and the Dissemination Studies. A copy of the screening questionnaire used by interviewers is provided in Appendix 4.

Of 280 organizations screened by the interviewers and found eligible to participate, 58 were resource organizations, 188 were user organizations, and 34 were both user and resource organizations. Sixty-eight organizations screened were not eligible to participate for the following reasons: they provided secondary prevention (n=3); they targeted aboriginal populations only (n=1); or they were primarily involved in advocacy (n=10), allocation of funds, fund-raising, facilitating joint efforts among organizations, research, or knowledge transfer (n=54). Five organizations could not be reached and were never screened. Nineteen eligible organizations declined to participate (9 resource; 8 user; 2 both). The response proportion for all CDP organizations was 92% (Figure 4.2). The response proportion was 88% and 96% in resource and user organizations respectively.

Figure 4.2 Description of selection of eligible organizations into the survey



4.1.6 Recruitment of organizations and key informants into the reliability sub-study

All organizations were invited to participate in an inter-rater reliability sub-study. To be eligible, the senior manager had to have identified at least two key informants knowledgeable about CDP programming within the organization. In organizations where two individuals were nominated, the senior manager was asked to designate these potential key informants as either primary (i.e., the person most knowledgeable about CDP programming in the organization) or secondary (i.e., a person with knowledge about CDP programming, but not the person who was “most knowledgeable”). Secondary key informants were contacted and their participation in the reliability sub-study was solicited using the same protocol as the one used for primary key informants.

4.2 DEVELOPMENT OF SURVEY INSTRUMENTS

The purpose of this section is to present a general description of the development of the survey instruments used in both studies. Survey-specific details regarding instrument development are provided in section 4.4 for the Organizational Capacity Study and section 4.5 for the Dissemination Study.

Items included in the questionnaires were adapted from existing instruments or created *de novo* based on a comprehensive review of the literature. An initial pool of potential items was created and reviewed by a subgroup of the McGill and McMaster research teams for face and content validity. Adaptations of existing items included sharpening wording, and eliminating “double-barrelled” or double-meaning items. The most important changes to items used in previous studies were in the response scales. Given the objective to develop psychometrically sound measures and identify independent correlates of the constructs of interest through multivariate analyses, the aim was to develop response scales that: (i) were consistent across the concepts measured in the questionnaire; (ii) would minimize skip patterns (so that as many informants as possible would answer as many items as possible); and (iii) would yield normal response distributions. No item was used exactly as it was originally developed, and no existing scales were used in their entirety. Final selection of items to be included in the preliminary version of the questionnaire was made by the doctoral candidate, her supervisor (JOL), and one co-author (NK) according to three selection criteria:

- i) relevance of item to the study objectives
- ii) evidence of validity and/or reliability of item from published work
- iii) length of questionnaire

Extensive pre-testing with multiple iterative revisions led to further refinement of the questionnaires. This part of the developmental work included: (i) validating the content of the questionnaires with four researchers recognized nationally for their work in chronic disease health policy, health promotion, public health and dissemination; (ii) pre-testing

the items with public health researchers and practitioners working in HIV/AIDS prevention, injury prevention, and preventive dental health care; and (iii) pilot testing the questionnaire in nine organizations (Organizational Capacity Study) and 11 organizations (Dissemination Study) that delivered prevention activities unrelated to CVD, diabetes, respiratory diseases, or cancer. Pilot test informants included executive directors and program or evaluation staff from public health departments, resource centers, or non-profit organizations with mandates for infectious disease, injury prevention, or health and development of children. A “think aloud” procedure was used that involved asking interviewees to narrate their thought processes as they interpreted the questions and formulated responses (123).

4.2.1 Translation

The questionnaires were translated using an iterative protocol. Two francophone translators translated the questionnaires from English into French. Equivalence between the source language (SL: English) and target language (TL: French) versions was verified according to recommendations for cross-cultural adaptations of health measures (124,125). Face validity of the TL version prepared by Translator #1 was tested by having monolingual francophone public health practitioners paraphrase each item. Poorly understood items were revised. Two bilingual francophone public health researchers (who were experts in CDP and experienced in questionnaire development) were then provided SL and TL versions of the questionnaire and instructed to highlight discrepancies in semantic and conceptual equivalence in the instrument items, completion instructions, glossary of terms, and Likert scaling of responses. Further refinement of the initial TL version was provided by Translator #2 based on these experts’ comments. The refined TL version was reviewed by another bilingual francophone public health researcher and one bilingual anglophone investigator.

4.3 DATA COLLECTION

4.3.1 Interviews

Data were collected in structured telephone interviews (mean (\pm standard deviation) length 43 ± 17 minutes in user organizations; 68 ± 22 minutes in resource organizations) with key informants identified by a senior manager as most knowledgeable about implementation of CDP programs, practices, campaigns, or activities (in user organizations) or about dissemination of CDP programs, practices, campaigns, or activities (in resource organizations). One interview was conducted in each organization except in organizations where the senior manager identified more than one autonomous division or branch that conducted CDP activities. In these organizations, interviews were conducted with one knowledgeable person in each autonomous division. Key informants were e-mailed a copy of the questionnaire prior to the interview to allow for preparation and consultation with colleagues. Interviews were conducted in English or French, October 2004 to April 2005, by nine trained interviewers. Key informants included senior/middle managers, service providers, and professional staff. Random monitoring of telephone interviews was conducted by the doctoral candidate and one other researcher for quality control purposes. Inconsistencies in responses and missing data were resolved in follow-up telephone calls or e-mails.

4.3.2 Inter-rater reliability interviews

A total of 26 user and 17 resource organizations volunteered to participate in the inter-rater reliability study. The secondary key informant was interviewed separately by the same interviewer who interviewed the primary key informant.

4.3.3 Data management

Data were entered into a database management system developed by DataSpect Software, Montréal, Québec. To assure the confidentiality of participants' computerized data, each questionnaire was assigned an anonymous identification number. In addition, all identifying information about the key informant and organization was removed from the

paper version of the questionnaires completed by the interviewers thus ensuring anonymity during storage. Accuracy of data entry was verified by the doctoral candidate by comparing electronic database entries against responses recorded in the original questionnaire.

4.4 ORGANIZATIONAL CAPACITY STUDY

4.4.1 Study population

Of 280 organizations screened and eligible, 222 were classified as user organizations. This represents a complete census of all user organizations involved in CDP in Canada in 2004. Data were collected in 212 of the 222 user organizations in a total of 216 interviews. The number of interviews per province ranged from 5-70 (mean = 21, median = 17).

4.4.2 Development of the Organizational Capacity Study survey instrument

In general, the majority of items included in the Organizational Capacity Study survey instrument were adapted from instruments used in the Dissemination Phase of the Canadian Heart Health Initiative (CHHI). This particular phase (1994 – 2004) was undertaken in nine Canadian provinces (2). Only 5 of the 9 survey instruments used in this Dissemination Phase were relevant to our focus. These 5 demonstrate evolution in the conceptualization of organizational capacity over time. Ontario (CHIOPP – 1994 to 1998) was the first province to develop survey instruments, followed by Nova Scotia (HHNS – 1996 to 2001), Saskatchewan (SHHP – 1998 to 2003), Alberta (AHHP- 1999 to 2004) and BC (BCHHP – 1999 to 2004). We worked with these instruments (126-134) with other instruments (36,39,43,135-136), as well as with the general literature on organizational capacity to create de novo items for inclusion into an initial item pool. Items that tapped the major components of our conceptual model were, in general, adapted from existing items.

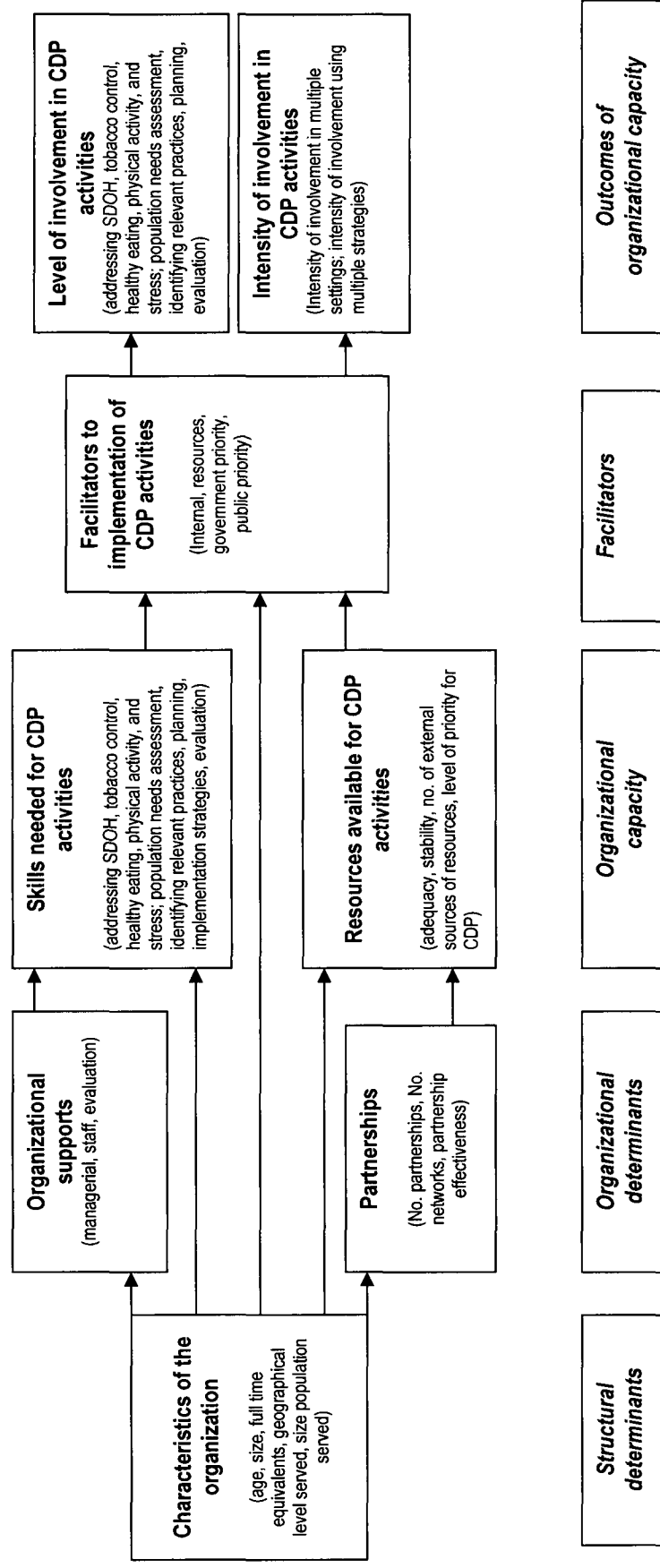
The final version of the questionnaire (Appendix 5) comprised 258 items covering: (i) organizational characteristics (i.e., defined herein as potential “structural determinants” of

capacity) (14 items); (ii) organizational supports for capacity (21 items); (iii) partnerships with other organizations (7 items); (iv) skills required for CDP programming (41 items); (v) resources available for CDP programming (20 items); (vi) involvement in CDP programming (30 items); (vii) implementation of CDP programming in different settings and using different strategies (60 items); (viii) facilitators (24 items); (ix) key informant characteristics (7 items); and (x) descriptive items or items contributing to skip patterns within the instrument (34 items). Most response sets were five-point Likert scales, with degree/extent or agreement response formats ranging from '1' (very low/strongly disagree) to '5' (very high/strongly agree).

4.4.3 Study variables for Organizational Capacity Study

The study variables included in the study were based on the new conceptual model of organizational capacity for CDP. A more detailed version of the conceptual model listing the variables measuring each concept is provided in Figure 4.3. Variables measuring each concept depicted in the conceptual model will be reviewed. A detailed description of these variables is provided in Appendix 6.

Figure 4.3 Conceptual model of organizational capacity for CDP with study variables



4.4.3.1 Measures of organizational capacity for CDP

Measures of organizational capacity included scales and single items rating skills required to conduct CDP programming and resources available for CDP programming. More specifically, we measured skills within the organization to undertake CDP activities related to (i) *social determinants of health* topics (1 scale measuring programming addressing: self-esteem, social support, socioeconomic status, work conditions, social exclusion, income inequalities), (ii) *tobacco control* (1 item), (iii) *healthy eating* (1 item), (iv) *physical activity* (1 item), and (v) *stress management* (1 item); as well as five separate scales measuring core CDP practice skills for: (i) *population needs assessment*, (ii) *identify relevant practices*, (iii) *planning*, (iv) using *implementation strategies*, and (iv) *evaluation* of CDP activities. Data on resources for CDP programming included (i) *resource adequacy* (1 scale) and (ii) *stability* (1 item), (iii) *access to external resources* outside the usual and main sources of funding (1 item), and (iv) level of *organizational priority for CDP* (1 item).

4.4.3.2 Measures of Structural and Organizational Determinants of Organizational Capacity for CDP

Structural determinants of organizational capacity investigated included: (i) characteristics of the organization [*age of organization*, *size of organization* (number of paid full time equivalents at the organization or CDP division level; number of volunteers)]; (ii) *geographical area served* (national, provincial, multi-province, regional); (iii) *population size served*.

Organizational determinants of organizational capacity included two categories of variables. First, indicators of internal organizational supports for developing/maintaining organizational capacity included: 1) *managerial supports*, with 1 scale measuring perceived accessibility of managers, effectiveness of internal communication, timeliness of decisions, etc.; 2) *staff supports* with 1 scale measuring adequacy of staffing levels for CDP, targeted hiring practices, professional development opportunities for CDP, participation in professional development, adequacy of administrative support for CDP, timeliness of access to CDP information; and 3) *evaluation supports* with 1 scale

measuring the existence of monitoring/evaluation policies, availability of monitoring/evaluation information and use of lessons learned from evaluation to make changes. Second, variables related to partnerships with other organizations included: (i) current *number of partnerships* (partnership defined as collaboration and sharing of resources to accomplish a specific set of activities); (ii) *number of networks* (network defined as a formal connection that has an established written structure and mission); and (ii) *partnership effectiveness* with 1 scale measuring adequacy of partnering for effective CDP, partnerships role in bringing in new ideas about CDP, partnerships role in bringing new resources for CDP, etc.

4.4.3.3 CDP Organizational Capacity Outcomes

Finally, outcomes of organizational capacity for CDP were operationalized as *level of involvement* and *intensity of involvement* in CDP programming. We measured *level of involvement* in programming related to *social determinants of health* (1 scale), *stress management* (1 item), and three behavioural risk factors namely, *tobacco control* (1 item), *healthy eating* (1 item), *physical activity* (1 item), as well as 4 separate scales measuring level of involvement in conducting *population needs assessment*, *identifying relevant practices*, *planning* and *evaluation*.

Intensity of involvement was measured for risk factor-specific activities spanning: 1) multiple delivery settings; and 2) multiple strategies/methods of delivery. Items used to create these variables came from the implementation of CDP programming in different settings and using different strategies section of the questionnaire. *Intensity of involvement across multiple settings* was scored for each individual behavioural risk factor (tobacco control, healthy eating, and physical activity) as well as for multi-risk factor activities involving a combination of individual behavioural risk factors. We inquired about four specific settings in which risk factor specific activities could be implemented (i.e., schools, workplaces, health care settings, and the community at large). Item responses to involvement levels in four settings were summed and recoded to maintain scores from 1 to 5. A more detailed description of the scoring strategy is provided in section 4.4.4.1. *Intensity of involvement using multiple strategies* was

measured for each individual behavioural risk factor (tobacco control, healthy eating, and physical activity) as well as for multi-risk factor activities involving a combination of individual behavioural risk factors. We inquired about involvement levels using 11 different CDP implementation strategies (i.e., group development, public education, skill building at the individual level, healthy public policy development, advocacy, partnership building, community mobilisation, facilitation of self-help groups, service provider skill building, creating healthy environments, volunteer development). Item responses to involvement levels using each of these 11 strategies in risk factor specific programming were summed and recoded to maintain scores from 1 to 5. A more detailed description of the scoring strategy is provided in section 4.4.4.1. Indicators of adoption of a socio-ecological approach (i.e., multi-level interventions that combine complementary environmental and behavioural components and span multiple settings) (31) were two global intensity of involvement scores calculated as engagement across: 1) multi-risk factors in multi-settings, and 2) multi-risk factors using multi-strategies. Scores for these global intensity of involvement variables were created based on quintiles of their respective cumulative frequencies.

4.4.4 Statistical methodology

Data analyses were conducted using SAS software, version 8.2 (SAS Institute, Inc, Cary, North Carolina) and SPSS software release 11 (SPSS Inc, Chicago, Illinois).

4.4.4.1 Principal components analysis

Separate psychometric analyses were undertaken for subsets of items selected to measure each construct in the conceptual framework, to assess unidimensionality and internal consistency. To determine if principal components analysis (PCA) was an appropriate analytic option, we undertook the following verifications of the data: 1) assessment of normality in individual items; 2) verification of the absence of outliers; and 3) examination of patterns of missing data (137). No imputation of missing data was required because few data were missing. See Table 4.1 for numbers of missing data pertaining to each PCA performed.

For every PCA, the informant to item ratio was ≥ 9 thereby meeting current guidelines for sample size (Table 4.1). Confidence in the stability of PCA solutions is enhanced when the ratio of subjects to number of items being analyzed and the total number of subjects is far enough removed from the absolute minimum of 5 subjects per item and at least 100 subjects (138-139).

Table 4.1 Informant to item ratio for principal components analyses in the Organizational Capacity study

PCA conducted	# Items analysed	# Factors obtained	N without missing values (usable data)	Informant to item ratio
Organizational supports	21	3	207	10
Partnerships	5	1	215	43
Skills level for:				
- Behavioural risk factors and social determinants of health (SDOH)	10	1	215	21.5
- Population needs assessment	9	2	216	24
- Planning	5	1	215	43
- Implementation strategies	11	1	215	19.5
- Evaluation	6	1	213	35.5
Resources	3	1	215	53.8
Facilitators	24	4	216	9
Level of involvement:				
- Behavioural risk factors and SDOH	10	1	215	21.5
- Population needs assessment	9	2	216	24
- Planning	5	1	215	43
- Evaluation	6	1	213	35.5
Total	124	20	Not applicable	Not applicable

All Bartlett's tests of sphericity attained statistical significance at ≤ 0.05 , and all Kaiser-Meyer-Olkin coefficients were ≥ 0.6 , showing that the data were appropriate for PCA analysis. The principal components method with varimax rotation was used to extract factors with eigenvalues greater than 1. Decisions about the number of factors to retain were based on: (i) Cattell's Scree Test of eigenvalues plotted against factors (140) and (ii) the number of factors needed to account for $\geq 50\%$ of the variance in the measured variables (139).

Following varimax rotation, only meaningful factor loadings taking the sample size³ into account (141) and therefore with values of at least 0.35, were examined. In all scales, items with factor loadings ≥ 0.42 were retained to construct unit-weighted scales, with the following stipulations: (i) that an item could not be retained in more than one factor, (ii) that each factor contained a minimum of three items, and (iii) that items loading on a given factor shared the same conceptual meaning (138). Items that did not fit these criteria were treated as single-item measures ($n=8$) or dropped ($n=12$) if they did not represent a key concept in the conceptual framework. Questionnaire items and the corresponding factor loadings are presented in Appendix 7.

The following measures of internal consistency were computed: (i) Kuder-Richardson 20 (142) for scales with dichotomous items; (ii) Cronbach's alpha (143) for continuous measures; and (iii) mean inter-item correlations (144). The range and distribution of individual inter-item correlations were examined to confirm unidimensionality or degree to which scale items assess a single underlying factor or construct (144). Interpretive labels were assigned to each scale.

It is important to note that these PCA analyses were both exploratory and confirmatory. While we would have liked to confirm our conceptual model, the literature in this area is relatively undeveloped and our measures are new. We therefore took a "conservative

³ Norman and Streiner (2000) stipulate that when the sample size is >100 , only factor loadings greater than $5.152/\sqrt{(N-2)}$ should be considered meaningful.

confirmatory” strategy (145). More specifically, we were not able to test a pre-existing theory or fit the data to a preconceived model (i.e. generate hypotheses regarding the number and the nature of the factors expected, then test these hypotheses by comparing the hypothesized factors and the factor solution obtained). However, we were guided by our conceptual model and we had collected data to tap each of the constructs in the model. These original items required transformation into sets of linear combinations/components, but we were not sure how many components there might be. The appropriate approach in such a case (i.e., when there is no mathematical model already established) is an unrestricted approach, such as PCA. Since we began with items expected to “hang well together”, it was reasonable to anticipate there would be substantial communality. Including all the variance (not just the common variance shared by the intercorrelated variables as in an exploratory factor analysis), would allow detection of factors we did not expect and could be meaningful.

Not all items were amenable to PCA. Items were excluded from PCA if they were: (i) descriptive (e.g., “Does your organization’s mission statement refer to chronic disease prevention or healthy lifestyle promotion?”), (ii) contributed to skip patterns (“In the past three years, has your organization applied for funds from outside sources to support CDP/HLP activities?” If not, the interview skipped the subsequent question about the specific outside sources), (iii) measured key informant characteristics, (iv) were scored dichotomously; (v) required numeric responses (i.e., counts such as number of partnerships) or (vi) measured intensity of involvement. The intensity of involvement variables used in the study were a special case since we wanted to develop a normally distributed score that would sum across the diversity and depth of involvement in a range of settings, strategies and risk factors. These items were not conceptually appropriate for PCA because there is no expected pattern of co-variation among them (for example, in a single organization the level of involvement in CDP in schools would not necessarily generate an expectation about the level of involvement in workplaces – i.e., we would not expect a pattern of moderate to strong co-variation, as is required for data reduction techniques such as PCA. For these variables, we created arithmetic scores by totalling across the relevant items and then producing quintile-based scores for each organization.

For intensity of involvement (multiple settings, individual risk factor) score, 4 responses (i.e., responses for all four settings including schools; workplaces; health care settings; and community-at-large for each of the four types of behavioural risk factor programming), were summed. For each organization this sum ranged from 4 to 20. For example, an organization that rated very low involvement or '1' in all four settings for physical activity programming would obtain a total of 4. Similarly, an organization that rated very high involvement or '5' in all four settings for physical activity programming would obtain a total of 20. These totals were recoded to range from 1 to 5 with 1=least intensely involved (sum 4-7); 2=less intensely involved (sum 8-10); 3=moderately involved (sum 11-12); 4=highly involved (sum 14-16); 5=very highly involved (sum 17-20). For intensity of involvement (multiple settings, all risk factors) score, 16 responses (i.e., responses over all four behavioural risk factors and all four settings) were summed. For each organization this sum ranged from 16 to 80. The intensity of involvement (multiple settings, all risk factors) score was created based on quintiles of the cumulative frequency and coded 1 to 5.

For intensity of involvement (multiple strategies, individual risk factor) score, 11 items were summed for each of the four behavioural risk factors. The 11 strategies included: (i) group development; (ii) public awareness and education; (iii) skill building at individual level; (iv) healthy public policy development; (v) advocacy; (vi) partnership building; (vii) community mobilization; (viii) facilitation of self-help groups; (ix) service provider skill building; (x) creating healthy environments; (xi) volunteer recruitment and development. For each organization this sum ranged from 11 to 55. These totals were recoded to range from 1 to 5 with 1=least intensely involved (sum 11-20); 2=less intensely involved (sum 21-28); 3=moderately involved (sum 29-36); 4=highly involved (sum 37-44); 5=very highly involved (sum 45-55). For intensity of involvement (multiple strategies, all risk factors) score, 44 responses were summed and ranged from 44 to 220. The intensity of involvement (multiple strategies, all risk factors) score was created based on quintiles of the cumulative frequency and coded 1 to 5.

To summarize the variable reduction, 124 items of the 258 items in the questionnaire were entered into several PCA. From these 124 single items, we developed 20 scales using a total of 104 items. Twelve arithmetic scores were created from 76 items and there were 15 single-item indicators. The components of the conceptual framework were therefore measured in 32 multi-item scales/scores and 15 single-item indicators.

Factor based scores for each scale were computed only for organizations that provided data for at least 50% of items that loaded on the scale. For these organizations, responses for the items in the scale were summed and then divided by the number of items completed to maintain the score in the original response range from one to five.

4.4.4.2 Descriptive statistics

Since this study reports data collected in all CDP organizations in Canada (not a sample), significance testing was not relevant. Means for continuous variables and frequencies for categorical variables were calculated and compared across three provincial groupings and three types of organizations. To protect confidentiality of organizations in smaller provinces, we created three broad groupings of provinces for analysis. “West” included organizations in British Columbia (BC), Alberta (AB), Saskatchewan (SK), and Manitoba (MB); “Central” included organizations in Ontario (ON) and Québec (QC); and “East” included organizations in New Brunswick (NB), Nova Scotia (NS), Prince Edward Island (PE), and Newfoundland and Labrador (NF). Organizations operating at a national level (n=6) were excluded from the analyses by provincial grouping due to the potential for identification. Four categories of organizations were created and included: (i) formally mandated regional public health organizations (PHO); (ii) nongovernmental organizations, national health charities, and non-profit organizations (NGO); (iii) grouped organization such as coalitions, partnerships, alliances, and consortiums (GO); and (iv) para-governmental agencies, professional associations, resource centres, and federal or provincial government departments (OTHER). The tables in Manuscript #2 include the OTHER category. However because of the heterogeneity of the organizations in this category, the description of the results pertaining to type of organization is restricted to PHO, NGO and GO.

Spearman rank correlation coefficients were computed to describe associations between hypothesized determinants and each of the skills and resources scales that comprise the capacity construct.

4.4.4.3 Inter-rater reliability

This study of inter-rater reliability of our measures on outcomes of organizational capacity was exploratory in that sub-studies of this nature are not generally conducted in organizational research due to feasibility issues. Inter-rater reliability coefficients were computed for 19 variables selected on the basis of their degree of “objectiveness”. More specifically these variables are observable and reportable by two members of an organization, and therefore could conceivably be validated against organizational records, as opposed to more ‘subjective’ or personal judgements. The variables tested included *level of involvement* in a variety of CDP programming activities (i.e., to address physical risk factors and social determinants of health, population needs assessment, identifying relevant practices, planning, and evaluation) and *intensity of involvement* across multiple settings and across multiple strategies.

Percent agreement, or the proportion of responses in which the two raters agreed, was calculated as a simple index of agreement for variables which had five-point Likert responses scales. However, this measure of agreement is limited in that it does not take agreement that occurs by chance into account, whereas the Kappa statistic (146) accounts for chance agreement. Since Kappa is particularly suited to binary, dichotomous variables, weighted kappas (147), a generalization for multiple categories, were calculated to assess inter-rater reliability for the *level of involvement* and *intensity of involvement* variables, which were all scored 1 to 5. This approach involves assigning weights to different levels of disagreement to represent levels of partial agreement.

Weighted kappa is the sum of weighted frequencies corrected for chance and is defined by

$$K_w = 1.0 - \frac{\sum w_{ij} \times p_{o_{ij}}}{\sum w_{ij} \times p_{e_{ij}}}$$

where w_{ij} is the weight assigned to the i, j cell; $p_{o_{ij}}$ and $p_{e_{ij}}$ is the observed and expected proportions of the i, j cell. Quadratic or Fleiss-Cohen (FC) weights (148) were used to weight disagreement by the square of the number of levels separating the raters. For each i, j cell, of a variable with k categories, weights were assigned as follows:

$$w_{ij} = 1 - \frac{(i - j)^2}{(k - 1)^2}$$

The quadratic weighting scheme was chosen over the linear weights proposed by Cicchetti and Allison (CA) (149). Although both of these standard weighting schemes assume distances between adjacent categories to be equal, FC weights give more credit for partial agreement. FC weights are suitable where scales have large numbers of categories or it is realistic to think in terms of an underlying continuum (148). Use of the quadratic system of weights yields results mathematically equivalent to the intraclass correlation coefficient, another measure of inter-rater reliability for two or more raters when data may be considered interval level. The interpretation of the weighted kappa is the same as Kappa, where 1.0 means perfect agreement while zero signifies agreement no better than chance.

4.5 DISSEMINATION STUDY

4.5.1 Study population

Of 280 organizations screened and eligible, 92 were resource organizations. This represents a complete census of all CDP-involved resource organizations in Canada in 2004. Eleven resource organizations declined to participate. Data were collected in 81 organizations in a total of 77 interviews. The number of interviews per province ranged from 1-17 (mean = 10, median = 7).

4.5.2 Development of the Dissemination Study survey instrument

With the exception of three items adapted from unpublished measures of organizational practices/activities for (heart) health promotion (126,128), items to measure dissemination practices and the correlates of dissemination were developed de novo drawing from the literature on knowledge transfer, utilization, and dissemination (82,88-89,94,109,116,121,150-151), planned social or organizational change (101-102), and educational intervention research (100).

To anchor responses and assist recall, key informants were instructed to provide responses to several items referring to the innovation (i.e., the chronic disease prevention/healthy lifestyle promotion program, practice, campaign or other activity) that their organization had most recently disseminated within the last three years. It was assumed that the most recent disseminated innovation would typify the organization's current dissemination practices. The key informant was instructed to select a "reference innovation" that was: (i) completely new, newly adapted from an existing program, practice, campaign or activity, or part of a larger new or newly adapted program; (ii) focused on primary prevention; (iii) developed with the intent to disseminate to other organizations that work with large groups or populations; and (iv) completely disseminated or had reached a sufficiently advanced stage in the dissemination process to allow the key informant to fully reflect on the experience.

The final version of the questionnaire (Appendix 8) comprised 237 items covering: (i) organizational characteristics (7 items); (ii) dissemination practices (72 items); (iii) a description of the “reference” innovation (42 items); (iv) factors affecting dissemination practices (109 items); and (v) key informant characteristics (7 items). Response sets included yes/no, numeric options, and five-point Likert scales, with degree or extent or agreement response formats ranging from ‘1’ (very low/strongly disagree) to ‘5’ (very high/strongly agree).

4.5.3 Study variables for the Dissemination Study

The variables included in the study were based on the new conceptual model of dissemination of CDP innovations from resource to user organization(s). Study variables measuring each construct depicted in the conceptual model comprised single items, scales developed using PCA and arithmetic scores created from multiple yes/no items. Statistical methodology used to derive these variables is presented in the following Section 4.5.4.

4.5.3.1 Measures of dissemination

The 13 variables measuring dissemination practices included the following: *identification of the need for the innovation* (1 item); *development of a linkage system* (arithmetic score - 24 items); *collaboration* between resource and user organizations *during development* of the innovation (1 scale); *collaboration* between resource and user organizations *during transfer* of the innovation (i.e., actual handing over of the innovation) (1 scale); *collaboration* between resource and user organizations *during evaluation* of the dissemination process (1 item); *identification of barriers to adoption and implementation* of the innovation by the user organization (1 item); *identification of facilitators to adoption and implementation* of the innovation by the user organization (1 item); *selection of strategies* to overcome barriers or to promote facilitators (arithmetic score - 12 items); *tailoring dissemination strategies* to individual user organization(s) (1 item); *design of dissemination plan* (1 scale); *enhancement of user capacity* to adopt and implement the innovation (arithmetic score - 9 items); *fidelity to dissemination plan* (1 item); and *evaluation of dissemination process* (arithmetic score - 7 items). A detailed

description of these measures including their psychometric properties is provided in Appendix 9.

4.5.3.2 Measures of potential correlates

The seven types of potential correlates depicted in the conceptual model were measured using 23 study variables. These study variables related to: i) structure of the resource organization - five variables measuring *age of organization*, *type of organization* [(formally-mandated regional-level public health organizations, non-governmental organizations (including health charities, other non-governmental organizations and non-profit organizations), grouped organizations, and others (including para-governmental agencies, professional associations, resource centers, federal/provincial government departments)], *size of organization* (number of paid full time equivalents at the organization or CDP division level, number of volunteers); *geographic level served* (national, provincial, multi-province, regional), and *national region location/jurisdiction* (East, Central, West, Canada); ii) user-centeredness of dissemination efforts – one variable measuring *user-centeredness* (1 scale); iii) openness/orientation toward dissemination -four variables measuring *attitude toward process of collaboration* (1 scale), *attitude toward linkage* (1 scale), *organizational support for professional development in dissemination* (1 item), *frequency of professional development in dissemination* (1 item); iv) capacity - five variables measuring *skill at planning/implementing dissemination* (1 scale), *skill at evaluating dissemination* (1 scale), *skill at collaborating with user organizations* (1 scale), *adequacy of resources for dissemination* (1 scale), *external sources of funding specifically allocated for dissemination of innovations* (arithmetic score - 11 items); v) incentives to disseminate – three variables measuring *dissemination incentive in the form of job satisfaction* (1 scale), *dissemination incentive in the form of professional recognition* (1 scale), *dissemination incentive in the form of access to funding* (1 item); vi) organizational flexibility – one variable measuring *user type diversity* (arithmetic score - 11 items); vii) organizational commitment to dissemination – three variables measuring *designated person in charge of dissemination* (1 item), *championing of dissemination* (1 item), *dissemination considered*

part of job (1 item). A detailed description of these variables including psychometric properties is provided in Appendix 9.

4.5.4 Statistical methodology

This analysis pertains to 77 resource organizations engaged in developing and disseminating CDP innovations to other organizations.

4.5.4.1 Principal components analysis

Psychometric analyses were conducted according to the description provided in section 4.4.4.1 to create reliable and parsimonious study variables and to assess the unidimensionality and internal consistency for each subset of items intended to measure dissemination practices or correlates of dissemination. Departures from the Organizational Capacity Study as they pertain to PCA are presented herein.

In the majority of scales, items with factor loadings ≥ 0.55 were retained to construct unit-weighted scales, with the following stipulations: (i) that an item could not be retained in more than one factor; (ii) that each factor contained a minimum of three items; and (iii) that items loading on a given factor shared the same conceptual meaning (138). Items that did not fit these criteria were treated as single-item measures ($n=2$) or dropped ($n=5$) if they did not represent a key concept in the conceptual framework. A total of 56 items were entered into several principal components analyses. Twelve multi-item scales and two single item measures were developed using PCA. In all PCA, the key informant to item ratio was ≥ 6 , thereby meeting current guidelines for sample size (138-139) (Table 4.2). Questionnaire items and the corresponding factor loadings are presented in Appendix 10.

PCA-based scale construction was not appropriate when items selected to measure a dissemination practice component or potential correlate did not share the same response categories, did not represent one single underlying construct or had dichotomous response sets. Four dissemination practice variables and two correlate variables comprised several yes/no items. For each of these variables, all positive responses were

summed. In the case of the dissemination practice variables, the cumulative frequency was quintiled, then the rankings were re-coded to create a score from 1 to 5.

To summarize the variable reduction, 56 items of the 237 items in the questionnaire were entered into several PCAs. Using 49 of 56 items, we developed 12 scales. Six arithmetic scores were created from 74 items and there were 19 single-item indicators. The components of the conceptual framework were therefore measured in 18 multi-item scales/scores and 19 single-item indicators.

Table 4.2 Informant to item ratio for principal components analyses in Dissemination Study

PCAs conducted	# Items analysed	# Factors obtained	N without missing values (usable data)	Informant to item ratio
Collaboration with user:	10	2	75	7.5
- during development (Factor 1)				
- during transfer (Factor 2)				
Dissemination Plan Design	5	1	76	15
Attitude:	7	2	77	11
- linkage (Factor 1)				
- process of collaboration (Factor 2)				
Incentives	8	2	76	9.5
- job satisfaction (Factor 1)				
- professional recognition (Factor 2)				
Skill at:	12	3	76	6
- Planning/implementing dissemination (Factor 1)				
- Evaluating dissemination (Factor 2)				
- Collaborating with user (Factor 3)				
User-centeredness	9	1	77	8.5
Adequate resources	3	1	75	25
Total	54	12	Not applicable	Not applicable

4.5.4.2 Descriptive statistics

Initial descriptive examinations of the data included frequencies for categorical variables, means for dissemination practice scales and scores or medians for skewed count variables. Organizations were labeled, “heavily engaged” in a dissemination practice if the practice score: (i) equaled ‘4’ or ‘5’ on a 5-point Likert scale or the quintiled ranking of the cumulative frequency or (ii) was a positive response to the dichotomous practice score.

4.5.4.3 Inter-rater reliability

Inter-rater reliability was not assessed due to: (i) the small number of organizations (n=17) that were able to provide two key informants knowledgeable in dissemination of CDP; and (ii) the large proportion of these pairs of key informants (64%) that did not cite the same “reference innovation” needed for meaningful comparisons of responses.

4.5.4.4 Multiple linear regression analysis

Multiple linear regression analysis was used to identify independent correlates of dissemination. One organization did not provide any responses to questions concerning dissemination practices. Therefore scores for the dependent variable, dissemination, were available for only 76 organizations. Similarly, one independent variable (selected in the automated procedure) had a missing value. Therefore, multivariate analyses were undertaken with n=75 (rather than 77) organizations.

Dependent variable

A summary dissemination score (hereafter referred to as DISSEMINATION) using the scores for each individual dissemination practice was created to reflect the comprehensiveness of the dissemination process. Eight dissemination practice scores were based on 5-point Likert scales. Four practice scores were based on 5 point scales derived from the quintiled frequency distribution of summed positive responses to a series of yes/no items. One practice score was based on a dichotomous scale. DISSEMINATION was the arithmetic sum of the 13 practice scores. In order for the one dichotomous score to provide adequate weight in the overall DISSEMINATION score, a linear transformation was undertaken to transform the 0/1 scale to a 2/4.5 scale. The DISSEMINATION score was normally distributed and ranged from 29.5 to 60.5 (mean (sd) = 43.6 (7.6); median = 44.0).

Independent variables:

Twenty-three potential correlates were tested as independent variables. Four were categorical with more than two categories; one was dichotomous; three were continuous, and 15 were viewed as continuous (5-point Likert scale variables). Screening continuous

variables for normality led to a logarithmic transformation of two continuous variables (AGE and SIZE) to reduce severe skewness. Dummy variables were created for all multi-level categorical variables, namely TYPE, GEOGRAPHICAL REGION, and PROVINCIAL GROUPING. A fourth variable, VOLUNTEER (which was originally continuous, highly skewed, and with 13 missing responses) was categorized as: Missing, ≤ 12 (median), > 12 , and a dummy variable was then created for this variable as well. The reference category for all dummy variables was the category with the largest n.

Model selection

Simple linear regressions were run with each independent variable. Only independent variables with parameter estimates at $p \leq 0.20$ were retained for entry in the preliminary model. Consistent with the number of independent variables recommended for regression analysis (152) with 77 independent observations, this approach allowed reduction of the number of candidate independent variables to 11. Those correlates identified in backward selection (SLSTAY=0.15), stepwise (SLENTY and SLSTAY=0.15) and all subsets (BEST=15) automated selection strategies were retained for the final model. Residual plots were inspected to verify linearity, normality, and homoscedasticity assumptions. Collinearity was assessed based on tolerance statistics and eigenvalues. Jackknife residuals and Cook's D statistics were used to identify potential outliers and influential observations.

Interaction modeling

There was no main effect considered in these analyses, therefore interaction modeling was restricted to covariates comprising the capacity construct (i.e., skills and resources), as well as organizational type. The total number of potential interaction terms to test was limited due to lack of substantive direction and power considerations. It was proposed that external funding could modify the effect of skills on DISSEMINATION (skills * resources interaction), that type of organization could modify the effect of skills (T1*skills; T2*skills), and finally that type of organization could modify the effect of external resources (T1*resources; T2*resources). No individual interactions terms were

tested following a preliminary non significant multi-partial F test ($F=0.74$, p-value 0.6; 5 df in numerator).

Cross-validation

Reliance on automated model selection procedures can lead to inflation of Type I error rate. Split-sample cross validation was used to verify the performance of the final model in an “independent sample”. First, the data set was divided into two random sub-samples (termed estimation and cross-validation samples). The final model based on automated selection procedures was run in the estimation sample ($n=39$; $F\text{-value}=3.44$, $R^2=0.39$). The prediction equation based on the estimation sample data was applied to the cross-validation sample ($n=38$). The correlation between the predicted and actual scores in the cross-validation sample ($r = 0.6$) was squared ($0.6^2 = 0.36$) and compared to the R^2 from the estimation sample. A large discrepancy between the R^2 values would indicate overfitting.

Correlated data

Organizations located in the same province may share contextual factors related to demographics, politics, environment, and public health system structure. These commonalities may have impact on the way organizations located in the same part of the country disseminate innovations. DISSEMINATION within provinces may be somewhat more similar than DISSEMINATION between provinces, with the potential that these data may have a group structure. Ignoring this structure violates the assumption of independence; standard errors would be negatively biased, making statistical tests for the significance of individual regression coefficients too sensitive, leading to overestimation of significance or alpha inflation. The strength of possible clustering by province in these data was measured by the intra-class correlation coefficient (ICC). Specifically, the ICC was used to determine the proportion of variance in DISSEMINATION that is be attributed to provincial location.

The ICC, ρ , was defined by:

$$\frac{\sigma_b^2}{\sigma_b^2 + \sigma_w^2}$$

where σ_b^2 is the variance between clusters (provinces) and σ_w^2 is the variance within clusters (provinces).

The ICC ranges from zero for complete independence to one for complete dependence. The ICC value for these data was 0.06. An ICC value greater than 0.01 can suggest clustering in a data set which should be addressed (153).

Cluster sizes ranged from 1 to 17, so that a re-definition of “province” was required in order to answer any cluster-level questions. Seven “province” clusters were defined as follows: Cluster 1=NF, PE, NS, NB (n=14); Cluster 2=QC (n=15); Cluster 3=ON and Canada (n=24); Cluster 4=MB (n=5); Cluster 5=SK (n=6); Cluster 6=AB (n=6); and Cluster 7=BC (n=7).

A Generalized Estimating Equation (GEE) procedure with exchangeable covariance structure was used to fit the regression equation taking any clustering into account by adjusting regression coefficients and standard errors accordingly. Regression coefficients are interpreted as population average estimates.

CHAPTER 5: RESULTS

The purpose of this chapter is to present three manuscripts that together describe two complementary research projects. The first two manuscripts describe the capacity of organizations that comprise the Canadian preventive health system to implement CDP innovations. The third manuscript provides data on the dissemination of CDP innovations from resource organizations to user organizations that will adopt and implement the innovation. The results presented in these three papers span the entire continuum of innovation development-dissemination-utilization as it pertains to the preventive health system. A preamble to each manuscript describes which thesis objectives are addressed in the manuscript, the specific objectives of the manuscript, what contributions the manuscript makes to the literature and finally how the manuscript relates to the overall program of research presented in this dissertation.

5.1 PREAMBLE MANUSCRIPT 1

There is as yet little consensus among public health practitioners and researchers on how to conceptualize or measure organizational capacity for chronic disease prevention. Reliable and valid measures of organizational capacity, its determinants, and its outcomes are needed to support evidence-based decision making and investment in chronic disease prevention.

The first manuscript presented in this thesis addresses the following objectives: (i) to introduce a new conceptual model of organizational capacity for CDP in the preventive health system; (ii) to describe item development and pre-testing of the survey instrument; (iii) to describe the development of the measures of organizational capacity, its possible determinants, and its outcomes; (iv) to assess the internal consistency of scales and inter-rater reliability of selected variables; and (v) to describe the methodology of the Organizational Capacity study.

The development of conceptually and psychometrically sound measures described in this manuscript was the first step to address the knowledge gaps on levels of capacity of Canadian public health organizations to undertake CDP programming. These measures were used in the national survey on organizational capacity described in Manuscript 2.

N.B. Tables, figures, references, and appendix are numbered consecutively as they are in sequence with those cited in the thesis. In contrast to the thesis, British spelling conventions are used throughout this manuscript. Terminology evolved throughout this project resulting in the term “respondent” and the abbreviation CDP/HLP used in this manuscript being replaced by “key informant” and CDP, respectively, in Manuscripts 2 and 3.

Published in the *Journal of Epidemiology & Community Health*, 2007; 61:742-749, the reprint of this manuscript is provided in Appendix 11. Permission to reproduce this work was obtained from the BMJ Publishing Group (Copyright waiver – Appendix 12).

Building the backbone for organisational research in public health systems: development of measures of organisational capacity for chronic disease prevention

Nancy Hanusaik¹, Jennifer L O'Loughlin²⁻⁴, Natalie Kishchuk⁵, John Eyles⁶, Kerry Robinson⁶, Roy Cameron^{7,8}

¹ Department of Epidemiology, Biostatistics and Occupational Health, McGill University

² Department of Social and Preventive Medicine, University of Montreal

³ Centre de recherche du Centre hospitalier de l'Université de Montréal

⁴ Institut national de santé publique du Québec, Montréal

⁵ Natalie Kishchuk Evaluation & Research Inc, Kirkland

⁶ School of Geography and Earth Sciences, McMaster University

⁷ Department of Health Sciences and Gerontology, University of Waterloo

⁸ Centre for Behavioural Research and Program Evaluation, University of Waterloo

ABSTRACT

Background: Research to investigate levels of organisational capacity in public health systems to reduce the burden of chronic disease is challenged by the need for an integrative conceptual model and valid quantitative, organisational-level measures.

Objective: To develop measures of organisational capacity for chronic disease prevention/healthy lifestyle promotion (CDP/HLP), its determinants, and its outcomes, based on a new integrative conceptual model.

Methods: Items measuring each component of the model were developed or adapted from existing instruments, tested for content validity, and pilot tested. Cross-sectional data were collected in a national telephone survey of all 216 national, provincial and regional organisations that implement CDP/HLP programs in Canada. Psychometric properties of the measures were tested using principal components analysis (PCA) and by examining inter-rater reliability.

Results: PCA-based scales showed generally excellent internal consistency (Cronbach's alphas 0.70-0.88). Reliability coefficients for selected measures were variable (weighted kappas 0.11 to 0.77). Indicators of organisational determinants were generally statistically and positively correlated with organisational capacity ($\rho=0.14-0.45$, $p<0.05$).

Conclusions: This study developed psychometrically sound measures of organisational capacity for CDP/HLP, its determinants, and its outcomes based on an integrative conceptual model. Such measures are needed to support evidence-based decision-making and investment in preventive health systems.

INTRODUCTION

Chronic diseases including cardiovascular disease (CVD), cancer, diabetes and respiratory illness remain an enormous and growing burden on health care systems in Canada (154,155) and elsewhere (6). Although many chronic diseases are preventable, there are few examples of successful chronic disease prevention and healthy lifestyle promotion (CDP/HLP) programs that reduce population-level morbidity and mortality (156). Based on increased understanding that health systems are important socio-environmental determinants of health (48), researchers are now investigating if health systems, and more specifically organisations that develop and deliver CDP/HLP programs within health systems, have adequate capacity to effectively contribute to reducing the chronic disease burden. However, these efforts have encountered at least three notable challenges.

First, despite growing interest in this area, there is no widely accepted definition of organisational capacity in the health context. Organisational capacity has been defined variably in the literature, borrowing from definitions used in research on practitioner capacity (34) and/or community/organisational capacity-building for health promotion (35-42). Within the public health context, Hawe *et al* (43) conceptualized organisational capacity for health promotion ('capacity of an organisation to tackle a particular health issue') as having at least three domains: organisational commitment, skills, and structures. Labonte and Laverack (40) described government/non-governmental organisational capacity as the structures, skills, and resources required to deliver program responses to specific health problems. Within the CVD prevention/heart health promotion domain, organisational capacity to conduct effective health promotion programs has been conceptualized as a set of skills and resources (44). This definition was expanded to include knowledge (45) and commitments (46). Others (47) have adopted the Singapore Declaration definition of organisational capacity (48) as the capability of an organisation to promote health, formed by the will to act, infrastructure, and leadership. Finally, Naylor *et al* (49) included infrastructure, collaboration, evidence-base, policy and technical expertise as components of a capable organisation. Overall, skills and resources

to conduct CDP/HLP programs emerge in this literature as the two most common dimensions of organisational capacity in the public health context.

An issue related to lack of conceptual clarity is that, while substantial efforts have been made to identify dimensions of organisational capacity, few investigators have formulated clear conceptual boundaries between organisational capacity, its determinants, and its outcomes. In their surveys of Ontario public health units (PHUs) in 1994 and 1996, Elliott *et al* (50) and Taylor *et al* (44) distinguished between predisposition (i.e., level of importance ascribed to public health practices supportive of heart health initiatives), capacity (i.e., effectiveness in performing these practices), and implementation of heart health activities. This conceptual framework posited that capacity and predisposition are interrelated, and these in turn relate to implementation. In empirical testing of the framework, there were moderate correlations between predisposition and capacity, moderate-strong correlations between capacity and implementation, but no correlation between predisposition and implementation. Building on this framework, Riley *et al* (51) undertook path analysis using the same database to examine the relationships between 1997 levels of implementation and four sets of determinants: internal organizational factors; external system factors; predisposition; and capacity. The results supported a strong direct relation between capacity and implementation, and provided evidence that external system factors (i.e., partnerships, support from resource centres) and internal organizational factors (i.e., coordination of programs within the health unit) have indirect impact on implementation by influencing capacity. Predisposition was not retained in the model. Priority given to heart health within PHUs had a direct relationship with implementation. In 2001, McLean *et al* (46) proposed that the relation between organisational capacity and heart health promotion action is mediated by external factors such as funding and policy frameworks of provincial and national governments, and public understanding of health promotion. However external factors were treated as one of four indices of capacity in their analyses.

A second challenge is the lack of validated quantitative measures of organisational capacity, its determinants and its outcomes. Qualitative work has predominated in this

area, and although informative in terms of rich descriptive and locally meaningful information, qualitative research does not lend itself to generalization across organisations and jurisdictions. Quantitative work is needed to support qualitative work, and to provide decision-makers with standardized tools for measuring, managing, and improving CDP/HLP capacity. Measures of organisational capacity developed to date often include large numbers of diverse items in an effort to capture all possible dimensions of capacity. Although content validity is reported to be high for most measures (52), data on construct validity and reliability is limited, and few investigators have formally tested the psychometric properties of their measures (53,54).

A third challenge is that there are no nationally representative data on levels of organisational capacity in organisations with mandates for CDP/HLP. Such data are needed to guide evidence-based investment in building preventive health systems, and in particular to identify gaps and monitor changes in capacity over time. To date, surveys have been restricted to include only formally mandated public health organizations in specific geographical regions, with the exception of one survey that included both health and non-health community agencies involved in heart health promotion (45), and comparison across surveys is impeded because of the differing operational definitions of organisational capacity.

To address these challenges, we undertook a national survey of all organisations in Canada with mandates for CDP/HLP. The specific aims of this paper are twofold. First, we introduce a conceptual framework for research on preventive health services. Second, we describe the development of quantitative measures of organisational capacity for CDP/HLP, as well as possible determinants and outcomes of organisational capacity.

Conceptual framework

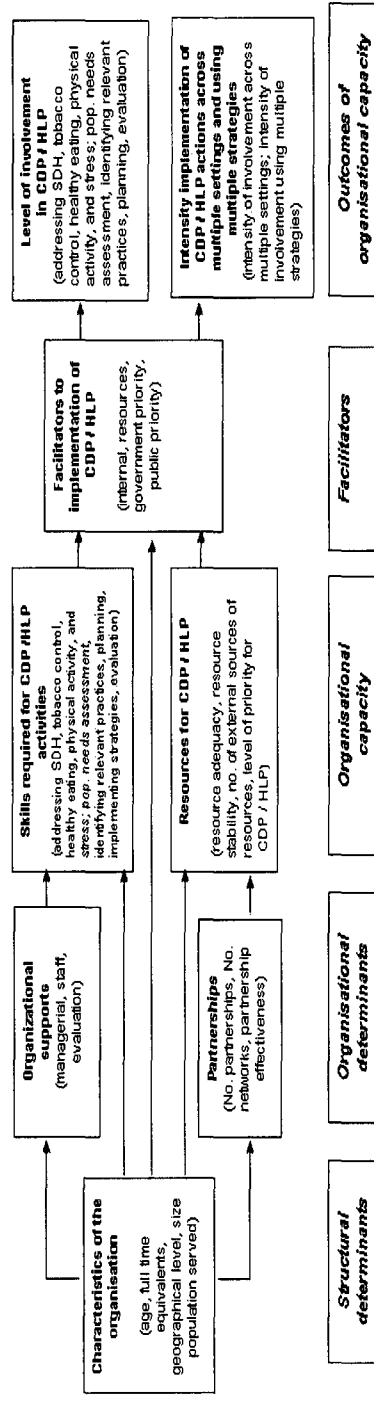
Our conceptual framework (Figure 5.1) addresses the challenges outlined above by: (i) adopting a parsimonious conceptualisation of capacity that encompasses skills and resources; (ii) separating factors purportedly related to creating capacity into organisational or structural determinants of capacity; (iii) postulating links between

capacity and outcomes of capacity (i.e., although there are many potential outcomes of capacity, level of involvement in CDP/HLP activities is the outcome of most interest in our framework); (iv) positioning facilitators as mediators between capacity and outcomes; and (v) more generally, adopting an approach suitable for empirical testing of the overall model. Rather than creating global scores that summarise across factors within the conceptual framework, we retain each variable as a unique entity. This will enhance empirical testing of the framework by enabling investigation of each factor separately, as well as the association between factors.

METHODS

Based on a comprehensive literature review, items were adapted from earlier questionnaires designed to measure organisational practices/activities for (heart) health promotion (36,39,43,127-136,157) or developed de novo. The content of an initial version of the questionnaire was validated by four researchers (recognized nationally for their work related to chronic disease health policy, health promotion, public health, and dissemination), and then a revised version was pre-tested in telephone interviews with nine organisations that delivered prevention activities unrelated to chronic disease. Pre-test respondents included executive directors and program or evaluation staff from public health departments, resource centres, or non-profit organisations across Canada with mandates for infectious disease, injury prevention, or health and development of children. The final version comprised 258 items covering: (i) organisational

Figure 5.1 Conceptual framework depicting potential determinants and outcomes of organisational capacity for CDP/HLP



OC for CDP is conceptualized as resources and skills required to implement CDP activities. *Structural determinants* of capacity include characteristics of the organisation. *Organisational determinants* include supports for developing/maintaining OC, as well as partnerships with other organisations. These are explicitly separated from capacity because they are seen as possible determinants of specific skills required for CDP capacity. *Facilitators* include factors internal and external to the organisation that mediate the impact of capacity on outcomes. Finally *outcomes* related to capacity include level of involvement in specific types of CDP activities, and extent of implementation (intensity of involvement) of CDP activities (i) across multiple settings and (ii) using multiple implementation strategies.

characteristics (i.e., structural determinants of capacity) (14 items); (ii) organisational supports of capacity (21 items); (iii) skills (41 items); (iv) resources (20 items); (v) involvement in CDP/HLP (30 items); (vi) implementation of CDP/HLP activities (60 items); (vii) partnerships (7 items); (viii) facilitators/barriers (24 items); (ix) respondent characteristics (7 items); and (x) skip or descriptive items (34 items). Most response sets were five-point Likert scales, with degree/extent or agreement response formats ranging from '1' (very low/strongly disagree) to '5' (very high/strongly agree).

Two francophone translators translated the questionnaire from English into French. Equivalence between the source and target language versions was verified according to recommendations for cross-cultural adaptations of health measures (124-125).

To identify organisations for inclusion in the survey, we undertook a complete census of all regional, provincial, and national organisations across Canada with mandates for the primary prevention of chronic disease (i.e., diabetes, cancer, CVD or chronic respiratory illness) and/or promotion of healthy eating, non-smoking, or physical activity. Government departments, regional health authorities/districts, public health units, non-governmental organisations (NGOs) and their provincial/regional divisions, para-governmental health agencies, resource centres, professional organisations, and coalitions, alliances and partnerships, were identified in an exhaustive Internet search and through consultations with key informants across Canada. All 353 organisations identified were invited to participate. Initial screening interviews were conducted with senior managers to confirm that the organisation met the inclusion criteria, to solicit participation, and to obtain contact information for potential respondents. Inclusion criteria included that the organisation: (i) was mandated to undertake primary prevention of chronic disease; (ii) was involved in developing/adopting programs, practice tools, skill or capacity-building initiatives, campaigns, activities, etc.; (iii) had transferred these innovations to other organisations in the past three years or had implemented the innovations in a specific target population.

Organisations that adopted or developed CDP/HLP innovations with the intent to deliver these innovations in specific populations were labelled “user” organisations. Those that developed and transferred CDP/HLP innovations to other organisations were labelled “resource” organisations. Of 280 organisations screened and eligible, 49 were resource organisations, 180 were user organisations, and 32 were both user and resource organisations. Sixty-eight organisations were not eligible to participate (i.e., they were mandated to provide secondary prevention, they targeted aboriginal populations only, or they were primarily involved in advocacy activities, funds allocation, fund raising, facilitation of joint efforts among organisations, research only, or knowledge transfer (not developing/adopting CDP innovations for implementation). Nineteen eligible organisations declined to participate. The response proportion was 92%.

Data were collected in structured telephone interviews (mean length 43 ± 17 minutes) with individuals identified by the senior manager as most knowledgeable about implementation/delivery of CDP/HLP programs, practices, campaigns, or activities. One interview was conducted per organisation except in organisations where senior managers identified more than one autonomous division/branch within the organisation that conducted CDP/HLP activities. In these organisations, interviews were conducted with one knowledgeable person in each autonomous division. Interviews were conducted in English or French, October 2004-April 2005, by nine trained interviewers. Respondents included senior/middle managers, service providers, and professional staff. Random monitoring of interviews was conducted for quality control. Inconsistencies and incomplete data were resolved in telephone calls or e-mails.

To assess inter-rater reliability, a second interview was completed in a sub-sample of 26 organisations, with a second individual knowledgeable about implementation/delivery of CDP/HLP programs, practices, campaigns, or activities. Respondents within the same organisation were interviewed separately by the same interviewer.

Data were entered into a database management system developed by DataSpect Software, Montreal, Quebec. All data entries were verified for accuracy by one investigator (NH).

Data analysis

This analysis pertains to 216 “user organisations,” which represent a complete census of Canadian organisations engaged in adopting/developing and implementing CDP/HLP innovations in select target populations.

We undertook separate psychometric analyses for subsets of items selected to measure each construct in the conceptual framework, to assess unidimensionality and internal consistency. To determine if principal components analysis (PCA) was an appropriate analytic option, we undertook the following checks: 1) assessment of normality in individual items; 2) verification of the absence of outliers; and 3) examination of patterns of missing data (137). No imputation of missing data was required because few data were missing. All Bartlett’s tests of sphericity achieved significance, and all Kaiser-Meyer-Olkin coefficients were ≥ 0.6 , showing that the data were appropriate for PCA analysis. The principal components method with varimax rotation was used to extract factors with eigenvalues greater than 1. Decisions about the number of factors to retain were based on Cattell’s Scree Test (140) and the number of factors needed to account for $\geq 50\%$ of the variance in the measured variables (139).

Items with factor loadings ≥ 0.44 were retained to construct unit-weighted scales, with stipulation that an item could not be retained in more than one factor, that each factor contained a minimum of three items, and that items loading on a given factor shared the same conceptual meaning (138). Items that did not fit these criteria were treated as single-item measures ($n=8$) or dropped ($n=12$) if they did not represent a key concept in the conceptual framework.

Cronbach’s alpha (143) and mean inter-item correlations (144) were computed to measure internal consistency. The range and distribution of individual inter-item correlations were examined to confirm unidimensionality (144). Interpretive labels were assigned to each scale.

Factor based scores for each scale were computed only for organisations that had data for at least 50% of scale items. Spearman rank correlation coefficients were computed to describe associations between hypothesized determinants and each of the skills and resources scales of the capacity construct.

PCA-based scale construction was not appropriate for two components of the conceptual framework (“resources available for CDP activities” and “intensity of involvement in CDP activities”), either because items selected to measure the component did not share the same response categories or they did not represent one single underlying construct. In both cases, scores were developed using arithmetic combinations of items, aiming to approximate normal distributions. The scoring strategy created two “all risk factor” scores (intensity of involvement (i) multiple settings score or (ii) multiple strategies score). Variations in sample size associated with differences in mandated risk factor programming required creation of an “intensity of involvement score” for each risk factor separately.

Inter-rater reliability coefficients (i.e., percent agreement and weighted Kappa (147) using quadratic (standard) weights, were computed for selected variables.

Data analyses were conducted using SAS software, version 8.2 (SAS Institute, Inc, Cary, North Carolina) and SPSS software release 11 (SPSS Inc, Chicago, Illinois). This study was approved by the Institutional Review Board of the Faculty of Medicine of McGill University.

RESULTS

Of the 216 organisations surveyed, 103 regional health authorities/districts and public health units/agencies were within the formal public health system. The remainder included NGOs ($n=54$), coalitions, partnerships or alliances ($n=41$), and others (government departments, para-governmental health agencies, professional associations, etc.) ($n=18$). Table 1 presents selected characteristics of participating organisations.

Table 5.1 Selected characteristics of the study population (n = 216)

Organisation Type, n (%)	
Formal Public Health*	103 (48)
NGO	54 (25)
Alliance, Coalition, Partnership	41 (19)
Other†	18 (8)
Size, median (range)	
Age (years)	27 (1.5-150)
Number Full Time Equivalents	53 (0-25 000)
Number Volunteers	35 (0-50 000)
Geographic Area Served, n (%)	
Regional	154 (71)

* Regional Health Authorities and Public Health Depts/Agencies

† Government, para-governmental health agencies, professional associations, resource centres, other

Overall, PCA confirmed our conceptualisation of the scales used to measure the components of our conceptual framework. Through PCA, we consolidated 124 individual items into 20 psychometrically sound scales, facilitating analysis and interpretation of these data. The components of our conceptual framework were measured in 32 multi-item scales/scores and 15 single-item indicators (Table 5.2). Factor loadings for items in the 20 scales were generally ≥ 0.71 . Cronbach's alphas were consistently above 0.64 and mean inter-item Spearman rank correlations coefficients ranged between 0.30-0.57, demonstrating good to very good internal consistency. Unidimensionality of scales was confirmed. Most inter-item correlations ranged from 0.20-0.70 and within each scale were clustered around their respective means.

Table 5.2 Measures of organisational capacity, and of potential determinants and outcomes of organisational capacity, including psychometric properties of scales developed

Measure*	No. of items	Cronbach's Alpha	Mean (sd) inter-item correlation	Range of inter-item correlations	Highest loading item (or single item)
Organisational Supports[†]					
Managerial Staff	9	0.88	0.49 (0.09)	0.37-0.73	Managers are accessible regarding CDP/HLP activities
	6	0.72	0.32 (0.12)	0.21-0.67	There are professional development opportunities to learn about CDP/HLP.
Evaluation	3	0.77	0.52 (0.17)	0.40-0.71	Monitoring and evaluation information about our CDP/HLP activities is available.
Partnerships[†]					
Effectiveness	5	0.75	0.37 (0.11)	0.25-0.60	Partnerships with other organisations are bringing new ideas about CDP/HLP to your organisation
Skills to address:[‡]					
Over the last three years, how would you rate your organisation's skill level:					
Social determinants of health	6	0.86	0.50 (0.12)	0.27-0.72	in CDP/HLP activities that address social exclusion?
Population needs assessment	3	0.80	0.56 (0.16)	0.47-0.74	for assessing the prevalence of risk factors?
Identify relevant practices	6	0.85	0.49 (0.10)	0.35-0.70	for reviewing CDP/HLP activities developed by other organisations to see if they can be used by your organisation?
Planning	5	0.88	0.57 (0.08)	0.49-0.70	for developing action plans for CDP/HLP?
Implementation strategies	6	0.80	0.39 (0.07)	0.17-0.46	for service provider skill building?
Evaluation	6	0.88	0.55 (0.09)	0.41-0.73	for measuring achievement of CDP/HLP objectives?
Resources[§]					
Adequacy	3	0.77	0.52 (0.14)	0.41-0.68	How adequate are the funding levels for CDP/HLP activities in your organisation?
Facilitators					
Internal	6	0.72	0.32 (0.13)	0.16-0.57	Organisational structure for CDP/HLP
Resources	4	0.83	0.55 (0.17)	0.38-0.79	Usefulness of the provincial resource organisations for CDP/HLP
Government priority	5	0.76	0.36 (0.17)	0.18-0.74	Level of provincial priority for CDP/HLP
Public priority	5	0.70	0.31 (0.13)	0.19-0.58	Level of public understanding of CDP/HLP

Measure*	No. of items	Cronbach's Alpha	Mean (sd) inter-item correlation	Range of inter-item correlations	Highest loading item (or single item)
Level of involvement[†]					
Over the last three years, how would you rate your organisation's involvement in:					
Social determinants of health	6	0.84	0.48 (0.10)	0.30-0.67	CDP/HLP activities that address socio-economic status?
Population needs assessment	3	0.81	0.57 (0.15)	0.47-0.75	assessing the prevalence of risk factors?
Identify relevant practices	6	0.84	0.46 (0.12)	0.29-0.70	finding relevant best practices in CDP/HLP to see if they can be used by your organisation?
Planning	5	0.86	0.54 (0.10)	0.43-0.71	developing action plans for CDP/HLP?
Evaluation	6	0.86	0.50 (0.12)	0.32-0.77	measuring achievement of CDP/HLP objectives?
Intensity of involvement - multiple settings^{†**††}					
How would you rate your organisation's level of involvement in:					
Tobacco control	4	0.73	0.41 (0.04)	0.37-0.46	tobacco control activities in the following settings?
Healthy eating	4	0.64	0.30 (0.11)	0.12-0.40	healthy eating activities in the following settings?
Physical activity	4	0.71	0.38 (0.15)	0.10-0.54	physical activity activities in the following settings?
Mixed risk factor ^{††}	4	0.70	0.35 (0.12)	0.12-0.47	multiple risk factor activities in the following settings?
Multiple settings score	16	0.89	0.35 (0.15)	-0.01-0.74	Score based on quintiles of cumulative frequency distribution of the sum of the above four variables.
Intensity of involvement - multiple strategies^{†§§ §§}					
How would you rate your organisation's level of involvement in:					
Tobacco control	11	0.87	0.38 (0.14)	0.03-0.69	tobacco control activities using the following strategies?
Healthy eating	11	0.86	0.36 (0.14)	0.07-0.71	healthy eating activities using the following strategies?
Physical activity	11	0.89	0.43 (0.11)	0.20-0.72	physical activity activities using the following strategies?
Mixed risk factor ^{††}	11	0.90	0.42 (0.13)	0.12-0.74	multiple risk factor activities using the following strategies?
Multiple strategies score	44	0.96	0.33 (0.14)	-0.06-0.79	Score based on quintiles of cumulative frequency distribution of the sum of the above four variables.

* All measures providing no information on psychometric properties (single-items or not PCA-based) are not shown; N used in analysis varied: Organisational supports (207-215); partnerships (215); Skills (213-216); Resources (215); Facilitators (216); Level of involvement (213-216); Intensity of involvement across multiple settings (93-190); Intensity of involvement using multiple strategies (92-189).

† Response category 1=strongly disagree to 5=strongly agree; ‡ 1=poor to 5=very good; § 1=much less than adequate to 5=more than adequate; || -3 = strong barrier to +3 = strong facilitator; ||| 1=very low to 5=very high

** Settings included: 1) schools; 2) workplaces; 3) health care settings; and 4) community-at-large

^{††} For intensity of involvement across multiple settings for individual risk factors, items were summed creating a range from 4 to 20. This total was recoded from 1 to 5 with 1=least intensely involved (sum 4-7); 2=less intensely involved (sum 8-10); 3=moderately involved (sum 11-12); 4=highly involved (sum 14-16); 5=very highly involved (sum 17-20). For intensity of involvement (multiple settings score): 16 responses were summed creating a range from 16 to 80. These totals were recoded from 1 to 5 based on quintiles of the cumulative frequency.

Mixed risk factor accounts for activities that combine two or more behavioural risk factors (tobacco, nutrition, physical activity); no double counting.

^{§§} Strategies included: 1) group development; 2) public awareness & education; 3) skill building at individual level; 4) healthy public policy development; 5) advocacy; 6) partnership building; 7) community mobilisation; 8) facilitation of self-help groups; 9) service provider skill building; 10) creating healthy environments; 11) volunteer recruitment & development.

^{|||} For intensity of involvement using multiple strategies for individual risk factors, items were summed creating a range from 11 to 55. Total was recoded from 1 to 5 with 1=least intensely involved (sum 11-20); 2=less intensely involved (sum 21-28); 3=moderately involved (sum 29-36); 4=highly involved (sum 37-44); 5=very highly involved (sum 45-55). For intensity of involvement (multiple strategies score): 44 responses were summed creating a range from 44 to 220. These totals were recoded from 1 to 5 based on quintiles of the cumulative frequency.

Inter-rater reliability coefficients were low-moderate for the 19 variables tested, with percent agreement ranging from 12.5% for “intensity of involvement in healthy eating using multiple strategies”, to 66.7% for “intensity of involvement in tobacco control across multiple settings” (Table 5.3). Weighted kappa coefficients which correct for chance and take partial agreement into consideration were generally less conservative, but nonetheless ranged between 0.11-0.78.

Table 5.3 Inter-rater reliability of measures of potential outcomes of organisational capacity (n = 17 pairs of raters) *

	Percent Agreement	Weighted Kappa (95% CI)
Level of involvement		
SDH	41.2	0.32 (0.00-0.65)
Tobacco control	41.2	0.65 (0.38-0.93)
Healthy eating	47.1	0.55 (0.20-0.89)
Physical activity	47.1	0.59 (0.25-0.92)
Stress	35.3	0.42 (0.01-0.83)
Population needs assessment	31.3	0.54 (0.26-0.82)
Identifying relevant practices	50.0	0.25 (-0.20-0.70)
Planning	47.1	0.27 (-0.14-0.69)
Evaluation	35.3	0.11 (-0.27-0.48)
Intensity of involvement across multiple settings		
Tobacco control	66.7	0.77 (0.50-1.04)
Physical activity	55.6	0.40 (-0.21-1.01)
Healthy eating	12.5	0.45 (0.02-0.89)
Mixed risk factor	56.3	0.77 (0.65-0.90)
Multiple settings score	47.1	0.54 (0.17-0.92)
Intensity of involvement using multiple strategies		
Tobacco control	50.0	0.78 (0.59-0.98)
Physical activity	33.3	0.51 (0.13-0.89)
Healthy eating	25.0	0.40 (0.09-0.71)
Mixed risk factor	37.5	0.40 (0.06-0.75)
Multiple strategies score	29.4	0.65 (0.38-0.92)

* Nine of 26 pairs of raters rated different organisational units or levels. Analyses are presented for the 17 pairs that rated the same organisational unit/level.

CI, confidence interval; SDH, social determinants of health

Determinants of organisational capacity were weakly or moderately correlated with organisational capacity indicators (Table 5.4). Few statistically significant correlations were observed between organisational capacity indicators and hypothesized structural determinants, with the exception that size of organisation was positively correlated with external sources of funding ($\rho=0.26$), and negatively correlated with priority for CDP/HLP ($\rho=-0.41$). Indicators of organisational supports were generally statistically significantly and positively correlated with organisational capacity. Correlations between skills (identification of relevant practices, planning, implementation strategies and evaluation) and resources (adequacy and priority) ranged between 0.21-0.45. Partnerships were also robustly correlated with several indicators of skills and with external sources of funding, but correlations were generally weak, ranging between 0.14-0.23.

Table 5.4 Spearman rank correlation coefficients between indicators of organisational capacity and potential determinants of organisational capacity (n = 216)

INDICATORS OF ORGANISATIONAL CAPACITY											
	SDH	Skills				Resources					
		Risk factors		Popula- tion needs assess- ment	Identify relevant practices	Plan- ning	Implemen- tation strategies	Evalua- tion	Adequacy	Stability	External sources
		Tobacco Eating	Healthy Physical Stress Activity								
Structural determinants											
Age	0.05	0.18**	-0.04	-0.09	0.0	0.16*	-0.04	0.01	0.12	-0.01	0.07
Size of organisation	0.08	0.14*	0.08	-0.15*	0.12	0.17*	0.07	0.04	0.09	0.10	-0.17*
Organisational Supports											
Managerial	0.19**	0.14*	0.18**	0.32**	0.12	0.23**	0.36**	0.37**	0.33**	0.36**	0.29**
Staff	0.01	0.14*	0.14*	0.16*	0.04	0.15*	0.21**	0.31**	0.18**	0.25**	0.43**
Evaluation	0.09	0.20**	0.01	0.07	0.04	0.16*	0.26**	0.45**	0.29**	0.43**	0.29**
Partnerships											
Number	0.05	0.20**	0.17*	0.12	0.06	0.09	0.23**	0.16*	0.17*	0.14*	-0.11
Effectiveness	0.16*	0.12	0.18**	0.04	0.02	0.18**	0.23**	0.20**	0.21**	0.11	0.25**

*p>0.05; **p>0.01

CDP/HLP, chronic disease prevention/healthy lifestyle promotion; SDH, social determinants of health.

DISCUSSION

There are major gaps in knowledge on organisational capacity for CDP/HLP (52) related, in part to the lack of a widely accepted, well-grounded conceptual model, as well as the lack of reliable measurement instruments. This paper provides conceptual and empirical clarification of the dimensions, determinants, and outcomes of organisational capacity to undertake CDP/HLP in public health organisations. We propose a series of psychometrically sound measurement instruments using data from the first national survey on levels of organisational capacity and implementation of CDP/HLP activities across Canada, with organisations as the unit of analysis.

Our PCA-based scales showed good psychometric properties including very good to excellent internal consistency, as well as evidence of unidimensionality. Inter-rater reliabilities were generally low for at least two reasons. First, most indicators comprised multiple items (i.e., 15-20 items per scale/score) so that the probability of disagreement between raters by chance alone is higher than would be for single-item indicators. Second, because organisations are inherently complex, data provided by a single individual may not reliably reflect the characteristics of, and processes within organisations. Steckler *et al* (158) suggested an alternative data collection strategy, namely to solicit a collective response through group interviews or questionnaires. Although possibly more valid, this method may be costly, more difficult to control and, in addition, might require a level of organisational commitment that affects response proportions negatively. Another strategy for collecting organisational-level data is to interview several respondents within the same organisation, and then average their scores. If raters disagree, this strategy may not be more useful than interviewing single respondents since the resulting averages may not represent coherent perspectives.

Although kappas were generally low, higher inter-rater agreement was observed for several measures, notably those related to tobacco control. This could reflect that tobacco control programs have existed in Canada for over 30 years, whereas public health interventions related to other risk factors such as stress or reducing social disparities, are

relatively new. The long-standing presence of tobacco control activities may have contributed to more consistent perceptions between respondents within the same organisation about the nature of tobacco control activities.

Our results uphold our conceptual model both in terms of its delineation of variables, as well as the relationship between these variables. Factors related to organisational supports were moderately related to capacity. These factors represent ways in which organisations provide information, staff, and professional development opportunities for CDP/HLP, use monitoring and evaluation in decisions about CDP/HLP programming, and provide leadership and commitment for CDP/HLP. Riley *et al* (51) observed that internal organisational factors (similar to our support factors) were indirectly related to implementation of heart health promotion activities through their effect on capacity. Partnership-related variables might also be important in understanding organisational capacity. Whereas partnerships were once viewed as an option for public health organizations, they are now increasingly seen as necessary to respond to the chronic disease burden. Partnerships can create mechanisms for public health organisations with limited financial resources to increase knowledge, resources and skills (159,160).

Limitations of this study include that data were collected from only one respondent within each organisation, albeit a respondent carefully selected as most knowledgeable about CDP. Since all measures were collected from the same respondent, correlations between measures may result from artifactual covariance rather than substantive differences (161). However, most measures were not highly correlated, suggesting this may not be a problem. Ideally, organisational-level constructs should be assessed using objective measures, but self-report is the most common method of data collection in organisational research. While we investigated content validity and both internal and inter-rater reliability of our measures, we could not examine criterion-related validity because there are no “gold standard” measures of the indicators of interest. While cross-sectional data can generate hypotheses about the relationships between variables in our conceptual model, longitudinal data are needed to investigate if these associations might be causal.

In summary, we propose several tools to facilitate systematic investigation of organisational capacity within public health systems. Based on an integrative conceptual model for research on organisational capacity, we developed conceptually and psychometrically sound measures of organisational capacity for CDP/HLP to support evidence-based decision-making and investment in preventive health systems.

WHAT IS ALREADY KNOWN

- There are major gaps in our knowledge on capacity of public health organisations to undertake community-based chronic disease prevention/healthy lifestyle promotion programming
- Researchers encounter three challenges:
 1. lack of a widely accepted conceptual model designed to enhance empirical testing of associations between organisational capacity, its hypothesised determinants, and outcomes
 2. lack of validated, quantitative measurement instruments of organisational capacity, its determinants, and outcomes
 3. no nationally representative data on levels of organisational capacity

WHAT THIS PAPER ADDS

- We propose a series of psychometrically sound measurement instruments using data from the first national survey on levels of organisational capacity and implementation of CDP/HLP activities across Canada with organisations as the unit of analysis

POLICY IMPLICATIONS

- Tools to facilitate systematic investigation of organisational capacity within public health systems are needed to support evidence-based decision making and investment in chronic disease prevention

5.3 PREAMBLE MANUSCRIPT 2

The second manuscript in the thesis describes levels of organizational capacity in western, central, and eastern Canada and across three types of CDP organizations that comprise the Canadian preventive health system. In addition it describes levels of determinants of organizational capacity and selected outcomes of organizational capacity.

The specific objectives were to: (i) to describe the distribution and characteristics of three main types of public health organizations engaged in CDP (i.e., formal public health organizations, non-governmental organizations, and grouped organizations including coalitions, partnerships, alliances and consortia) nationally and within each broad provincial grouping; and (ii) to describe levels, determinants and outcomes of organizational capacity according to three provincial groupings and across the three types of organizations.

This study adds to the few reports that describe the public health system in Canada, and the even fewer reports that describe its capacity to effectively engage in CDP. Furthermore, this is the first study to examine variability in levels of capacity between different types of organizations involved in CDP. The results presented in this manuscript increase understanding of the strengths and gaps in CDP organizational capacity and they provide an evidence base to guide strategic investment in the public health system. This manuscript builds on the results of the first manuscript in that the newly developed instruments described in Manuscript 1 were used to measure all key concepts in Manuscript 2.

This paper is under review at *Health Reports*, Health Statistics Division journal, Statistics Canada and is included in this thesis with permission from all co-authors (Release Form – Appendix 12)

5.4 MANUSCRIPT 2

Organizational capacity for chronic disease prevention in Canada: Results of a national survey

Hanusaik, Nancy¹, O'Loughlin, Jennifer L²⁻⁴, Kishchuk, Natalie⁵, Paradis, Gilles^{1,4},
Cameron Roy^{6,7}.

¹Department of Epidemiology, Biostatistics, and Occupational Health, McGill University

²Department of Social and Preventive Medicine, University of Montreal,

³Centre de recherche du Centre hospitalier de l'Université de Montréal

⁴Institut national de santé publique du Québec, Montréal, Québec

⁵Natalie Kishchuk Research and Evaluation Inc., Kirkland, Québec

⁶Department of Health Sciences and Gerontology, University of Waterloo

⁷National Cancer Institute of Canada, Centre for Behavioural Research and Program Evaluation, University of Waterloo

ABSTRACT

Background: There are no national data on levels of organizational capacity in the Canadian public health system to reduce the burden of chronic disease. In a national survey of all organizations in Canada engaged in chronic disease prevention (CDP), we compared levels, potential determinants, and outcomes of organizational capacity for CDP across provincial groupings and types of organizations.

Data & Methods: Cross-sectional data were collected from 216 national, provincial and regional-level organizations engaged in CDP. Levels of organizational capacity (defined as skills and resources required for CDP programming), potential determinants of organizational capacity (organizational supports and partnerships), and involvement in CDP programming were compared across western, central, and eastern Canada and across three types of organizations (formal public health organizations; non-governmental organizations; and grouped organizations including coalitions, partnerships, alliances and consortia).

Results: Forty percent of organizations were located in central Canada. Approximately 50% were formal public health organizations. Levels of skill and involvement were highest for programming related to tobacco control and healthy eating; and lowest for stress management, social determinants of health, and program evaluation. The few notable differences in skill levels by provincial grouping favoured central Canada. Resource adequacy was rated low overall but was lowest in eastern Canada and among formal public health organizations. Supports for developing organizational capacity were highest in central Canada and in grouped organizations.

Interpretation: These data provide an evidence base to identify strengths and gaps in organizational capacity and involvement in CDP programming across Canada.

Introduction

About 60% of all deaths worldwide are attributable to non-communicable chronic diseases (3), most notably cancers, cardiovascular diseases, diabetes, and chronic respiratory illnesses. In Canada, these diseases account for at least 70% of deaths and more than \$93 billion annually in direct health care and indirect productivity costs, respectively (4). As the population ages and the burden of chronic disease in the population and on health system resources increases, there is growing recognition of the need for prevention through comprehensive and integrated action. The public health system is of central importance to this prevention effort and it is crucial to ensure that this system has adequate capacity to address the burden effectively (5-6).

There are few reports that describe the public health system in Canada, and even fewer that focus on its capacity to effectively engage in chronic disease prevention and healthy lifestyle promotion (herein labelled CDP). More specifically, we know little about the structure, resourcing, and functioning of the public health system as it relates to CDP, or about the impact of CDP programs, practices, innovations, campaigns, and activities on population health. In addition it is not clear if recommendations regarding adoption of a socio-ecological approach stemming from the Ottawa Charter for Health Promotion (31) have been implemented. A recent review (29) suggests that the Canadian public health system might best be described as a “grouping of multiple systems with varying roles, strengths and linkages”. Frank *et al* underscored earlier observations (28) of important regional and inter-provincial disparities in capacity to address public health problems, which may, in turn, relate to differences in health across regions. Although CDP is a key function of the public health system (30), it is unknown whether these purported disparities relate to differential levels of organizational capacity for CDP and/or levels of CDP programming in Canada.

Public health services in Canada including population health assessment, surveillance, health promotion, disease and injury prevention, and health protection, are for the most part, provided by regional health authorities. These organizations are mandated by the

provincial/territorial governments to carry out these tasks, and are part of what may be termed the “formal public health system”. However other types of organizations also provide public health services and are involved in CDP programming, including among others, national health charities and their provincial chapters, other nongovernmental and non-profit organizations, and grouped organizations such as coalitions, partnerships, alliances, and consortia. These organizations are part of what may be termed the “informal public health system” in Canada and are characterized by wide diversity in mission, structure, and funding. Capacity for CDP within Canada is embedded within both the formal and the informal public health system.

While previous reports describe capacity for, or effectiveness in, achieving outcomes in specific types of organizations involved in public health, there are no reports that provide systematic comparisons of capacity across different types of organizations. For example, several studies assess the performance or effectiveness of public health units or agencies in carrying out mandated activities or recommended core public health functions (55-61). Others focus on the relationship between member- and/or organizational-level characteristics and impacts/outcomes in community-based coalitions (62-67) or on coalition sustainability (64,68). Previous studies examining organizational capacity for CDP have also been limited in the interpretation and generalizability of results because the sample was restricted to include only one type of organization (44,46-47) or organizations in one province only (69).

The capacity of organizations in the informal public health system has rarely been studied. In heart health promotion (70-72) and in non-CDP areas such as HIV (73-76), much of the research has focused on describing the development of organizational capacity in coalitions or community-based organizations. No study to date has examined differences in capacity between the many different types of organizations involved in CDP.

We undertook a national survey of all organizations in Canada currently engaged in CDP, in order to develop a portrait of organizational capacity for CDP in the Canadian public

health system. Such data are needed to identify strengths and gaps in CDP-related organizational capacity and to provide an evidence base to guide strategic investment in the public health system. The purpose of this paper is to present descriptive findings on levels, determinants and outcomes of organizational capacity according to provincial groupings and across types of organizations.

Methods

Cross-sectional data were collected October 2004-April 2005 in a national telephone survey of all national, provincial and regional-level organizations in Canada with mandates for CDP programming at the population level, either through the primary prevention of chronic disease (specifically diabetes, cancer, cardiovascular diseases or chronic respiratory illness) or the promotion of healthy eating, non-smoking or physical activity. Regional health authorities and public health units/agencies (herein referred collectively as formally-mandated regional public health organizations), government departments, national health charities and their provincial/district divisions, other non-governmental and non-profit organizations (herein referred to collectively as non-governmental organizations), para-governmental health agencies (defined as agencies financed by the government but acting independently of it), resource centres, professional organizations, and coalitions, partnerships, alliances, consortia (herein referred to collectively as grouped organizations) were identified in an exhaustive Internet search and through consultations with key contacts in all provinces. Based on screening interviews with senior management, organizations that adopt or develop CDP programs or innovations with the intent to deliver these in specific populations (i.e., organizations directly involved in front-line CDP programming) were categorized as “user organizations”. Those that develop and transfer CDP innovations to other organizations, without the intent to implement these innovations in specific populations, were categorized as “resource organizations” (162).

Structured telephone interviews (mean length 43±17 minutes) were conducted with one individual per organization, identified by a senior manager as most knowledgeable about implementation/delivery of CDP programs, practices, campaigns, or activities within the

organization. In national health charities which had provincial/regional divisions, interviews were conducted within each division, if it met the inclusion criteria and in addition was judged to be autonomous as an organization. Key informants received a copy of the questionnaire prior to the interview to allow for preparation and consultation with colleagues (162).

Study Variables

The measures included in the survey were based on a new conceptual model of organizational capacity for CDP which posits that greater levels of organizational capacity will lead to greater involvement in CDP programming defined here as, practices and programs addressing tobacco control, promotion of healthy eating, physical activity, the social determinants of health, and stress management. Briefly, items used to measure study variables were based on a review of the literature, adapted from existing instruments (36,39,43,126-136) or developed de novo. All items were translated into French, extensively pre-tested, and then subjected to psychometric analyses. Response sets for most items were five-point Likert scales ranging from '1' (very low/strongly disagree) to '5' (very high/strongly agree), and where relevant, the reference period used was the past three years. A detailed description of the study variables is provided in the Appendix 6. The conceptual model and detailed information on the derivation and psychometric properties of these measures has been reported (162).

Statistical analyses

The analyses reported here pertain to user organizations only. Since this study reports data collected in all CDP organizations in Canada (not a sample), significance testing is not relevant. Means for continuous variables and frequencies for categorical variables were compared across three provincial groupings and three types of organizations. To protect confidentiality, three broad provincial groupings of organizations were defined. "West" included organizations in British Columbia, Alberta, Saskatchewan, and Manitoba; "Central" included organizations in Ontario and Québec; and "East" included organizations in New Brunswick, Nova Scotia, Prince Edward Island, and Newfoundland. Organizations at a national level (n=6) were excluded from these

analyses due to the potential for identification. Data analyses were conducted using SAS software, version 8.2 (SAS Institute Inc., Cary, North Carolina).

Results

Of 280 organizations screened and eligible, 222 were classified as user organizations. This represents a complete census of all CDP-involved user organizations in Canada in 2004. Data were collected in 212 of the 222 user organizations (95.5%) in a total of 216 interviews. The number of interviews per province ranged from 5-70 (mean = 21, median = 17).

Forty percent of all user organizations were located in central Canada, 35% were located in the West and 25% in the East (Table 5.5). Approximately half of all organizations across Canada were formally-mandated regional public health organizations. In the West and East, a further one-third was non-governmental organizations. In contrast, in Central Canada, one-third was grouped organizations and only 13% were non-governmental organizations. Organizational size varied substantially across provincial grouping and type of organization. The median age of user organizations was 27.5 years: those in central Canada were the oldest. Non-governmental organizations were older on average than other types of organizations. Compared to other types of organizations, the median number of paid staff was highest in formally-mandated regional public health organizations.

Table 5.5 Characteristics of organizations engaged in chronic disease prevention and healthy lifestyle promotion in Canada according to provincial grouping and type of organization

Provincial Grouping					Type of Organization *				
	Total N=210	West N=74	Central N=84	East N=52	Total N=216	PHO N=103	NGO N=54	GO N=41	OTHER N=18
Type (%)									
PHO	49.0	55.4	47.6	42.3	-	-	-	-	-
NGO	23.8	31.1	13.1	30.8	-	-	-	-	-
GO	19.1	4.0	35.7	13.5	-	-	-	-	-
OTHER	8.1	9.5	3.6	13.4	-	-	-	-	-
Size (median)									
No. FTEs at organization level [†]	53.0	111.0	57.5	15.5	53.0	285.5	11.5	1.0	11.0
No. FTEs at CDP unit/division level [†]	14.7	13.5	17.5	10.5	14.7	17.0	4.0	0.0	6.0
Usual no. volunteers per year	35.0	75.0	29.0	40.0	35.0	30.0	250.0	20.0	15.0
Maximum no. volunteers per year	50.0	150	35.0	90.0	50.0	50.0	1000.0	23.5	19.0
Age (median years)	27.5	23.0	36.0	20.0	27.5	27.5	51.0	7.0	45.0

PHO=formally mandated regional public health organization; NGO=Nongovernmental organization, national health charity, non-profit organization; GO = Coalition, Partnership, Alliance, Consortium; OTHER=para-governmental, professional association, resource centre, federal or provincial government dept
[†] FTEs=Full time equivalents

Levels of Organizational Determinants

Table 5.6 describes indicators of supports within organizations for developing and maintaining organizational capacity for CDP. *Managerial support* for CDP was rated as relatively strong, but support for CDP program *evaluation* was rated as relatively weak. Scores for organizational supports were higher in central Canada than in the eastern and western provinces. Compared to other types of organizations, grouped organizations had the highest scores for all indicators of organizational supports. Table 5.6 also describes indicators of external supports for organizational capacity, namely partnerships and networks. Nationally, organizations reported a median of 15 partnerships (range 0-150) and 4 networks (0-100). Formally-mandated regional public health organizations had the highest number of *partnerships* and *networks*, although *partnership effectiveness* was rated lower in formally-mandated regional public health organizations than in other types of organizations. Non-governmental organizations had the lowest number of partnerships, but reported the highest level of *partnership effectiveness*.

Levels of Organizational Capacity

Organizational capacity in this study was conceptualized to include skills and resources. Table 5.7 describes skill levels for undertaking both core CDP practices including population needs assessment, identification of relevant practices, planning, use of implementation strategies, and evaluation, as well as risk-factor specific programming. In regard to core CDP practices, skills for *identifying relevant practices* and *planning* were rated more favourably than skills for program *evaluation*. In regard to risk factor-specific organizational capacity, skill levels for undertaking *tobacco control* and *healthy eating* programming were rated highest, and skill levels for undertaking programming related to *stress management* and *social determinants of health* were rated lowest. There were few notable differences in skill levels by provincial grouping, but those that did exist favoured central Canada. Formally-mandated regional public health organizations and grouped organizations reported similar skill levels.

Priority for CDP within organizations was consistently rated “high” across all three provincial groupings (Table 5.7). *Priority for CDP* was rated highest in grouped

organizations compared to other types of organizations. Although the priority for CDP was high, access to financial resources for CDP was uniformly rated low across provincial groupings. Key informants in eastern Canada rated *adequacy of resources* lower than those in the rest of the country. The median number of external sources of funding for CDP in the past 3 years was 2 (range 0-9). A higher proportion of grouped organizations reported CDP resources as adequate. Despite having more *external sources* of funding, formally-mandated regional public health organizations reported resource availability as less adequate.

Table 5.6 Levels of organizational determinants (organizational supports, partnerships) of organizational capacity for chronic disease prevention and healthy lifestyle promotion in Canada according to provincial grouping and type of organization

	Provincial Grouping					Type of Organization			
	Total N=210	West N=74	Central N=84	East N=52	Total N=216	PHO N=103	NGO N=54	GO N=41	OTHER N=18
Organizational Supports, mean (sd)*									
Managerial	4.0 (0.7)	3.9 (0.7)	4.2 (0.7)	4.0 (0.6)	4.0 (0.7)	3.9 (0.7)	4.0 (0.6)	4.3 (0.6)	4.2 (0.7)
Staff	3.5 (0.7)	3.4 (0.6)	3.8 (0.6)	3.2 (0.7)	3.5 (0.7)	3.4 (0.7)	3.5 (0.6)	3.6 (0.5)	3.4 (0.8)
Evaluation	3.2 (0.9)	3.0 (1.1)	3.5 (0.8)	3.0 (0.7)	3.2 (1.0)	3.1 (1.0)	3.0 (1.0)	3.6 (0.8)	3.3 (1.0)
Partnerships									
No. partnerships (median)	15.0	12.0	20.0	10.0	15.0	20.0	10.0	15.0	12.0
No. networks (median)	4.0	4.0	4.0	3.5	4.0	5.0	3.0	2.0	4.5
Partnership effectiveness (mean (sd))*	3.8 (0.7)	3.8 (0.7)	3.7 (0.7)	3.9 (0.7)	3.8 (0.7)	3.6 (0.7)	4.0 (0.7)	3.8 (0.7)	3.8 (0.5)

* Scored on a five-point Likert scale: 1= strongly disagree; 2=disagree; 3=neutral; 4=agree; 5=strongly agree

Table 5.7 Levels of organizational capacity for chronic disease prevention and healthy lifestyle promotion in Canada according to provincial grouping and type of organization

Provincial Grouping				Type of Organization				
Total	West	Central	East	Total	PHO	NGO	GO	OTHER
N=210	N=74	N =84	N=52	N=216	N=103	N=54	N=41	N=18
Core CDP practice skills, mean (sd):*								
Population needs assessment	3.7 (1.0)	3.5 (1.0)	3.5 (0.9)	3.6 (1.0)	3.7 (0.9)	3.7 (1.0)	3.1 (1.1)	3.8 (0.9)
Identifying relevant practices	3.8 (0.8)	3.8 (0.7)	3.8 (0.7)	3.8 (0.7)	3.8 (0.6)	3.6 (0.8)	3.9 (0.7)	3.9 (0.9)
Planning	3.6 (0.9)	4.0 (0.7)	3.6 (0.8)	3.8 (0.8)	3.8 (0.8)	3.6 (0.9)	4.0 (0.7)	4.1 (1.0)
Implementation strategies	3.5 (0.7)	3.7 (0.7)	3.7 (0.7)	3.6 (0.7)	3.6 (0.7)	3.6 (0.7)	3.6 (0.6)	3.8 (0.6)
Evaluation	3.3 (0.9)	3.4 (0.7)	3.3 (0.9)	3.3 (0.9)	3.4 (0.9)	3.2 (1.0)	3.3 (0.7)	3.6 (0.8)
Risk factor-specific skills, mean (sd)								
Social determinants of health	2.8 (1.1)	2.9 (0.9)	3.1 (0.8)	2.9 (0.9)	3.0 (0.9)	2.7 (1.1)	2.9 (0.7)	2.8 (1.0)
Tobacco control	3.8 (1.3)	4.5 (0.8)	4.0 (1.1)	4.1 (1.1)	4.3 (0.9)	3.7 (1.4)	4.1 (1.0)	3.8 (1.3)
Healthy eating	3.9 (1.2)	4.3 (0.9)	4.2 (0.9)	4.1 (1.0)	4.3 (0.8)	3.8 (1.1)	4.3 (0.8)	3.3 (1.6)
Physical activity	3.4 (1.3)	4.1 (1.0)	3.9 (1.0)	3.8 (1.2)	3.8 (1.1)	3.4 (1.2)	4.4 (0.7)	3.6 (1.6)
Stress management	2.8 (1.3)	3.0 (1.1)	3.0 (1.2)	3.0 (1.2)	3.2 (1.1)	2.7 (1.2)	3.0 (0.9)	2.4 (1.5)

Provincial Grouping					Type of Organization				
Total	West	Central	East	Total	PHO	NGO	GO	OTHER	
N=210	N=74	N=84	N=52	N=216	N=103	N=54	N=41	N=18	
Resources for CDP									
Resource adequacy for CDP [†] , mean (sd)	2.6 (0.9)	2.7 (0.9)	2.8 (0.8)	2.3 (0.9)	2.6 (0.9)	2.4 (0.8)	2.7 (0.8)	3.1 (0.8)	2.6 (0.8)
Resource stability, mean (sd)	1.7 (0.6)	1.7 (0.7)	1.8 (0.6)	1.6 (0.6)	1.7 (0.6)	1.8 (0.7)	1.7 (0.6)	1.9 (0.4)	1.6 (0.6)
No. external sources of resources (median)	2.0	3.0	2.0	2.0	2.0	3.0	2.0	1.0	1.5
Level of priority for CDP [†] , mean (sd)	3.7 (1.0)	3.6 (1.0)	3.9 (0.9)	3.6 (1.1)	3.7 (1.0)	3.3 (1.0)	3.9 (0.8)	4.6 (0.6)	3.9 (1.0)

* Scored on a 5-point Likert scale: 1 = poor; 2 = fair; 3 = moderate; 4 = good; 5 = very good

† Scored on a 5-point Likert scale: 1 = much less than adequate; 2 = less than adequate; 3 = neutral; 4 = adequate; 5 = more than adequate

‡ Scored on a 5-point Likert scale: 1 = very low priority; 2 = low priority; 3 = moderate; 4 = high priority; 5 = very high priority

Involvement in CDP Programming

Table 5.8 describes levels of involvement in CDP programming activities. Nationally, involvement was highest for *tobacco control* and lowest for activities related to *social determinants of health* and *stress management*. Higher levels of involvement were reported for CDP *planning* practices than for *evaluation* of CDP programs. There was little variability in these indicators across provincial groupings, with the exceptions that involvement in *tobacco control*, *healthy eating*, and *physical activity* was higher in central Canada, while involvement in *social determinants of health* was higher in the East. Involvement in CDP programming activities was highest in grouped organizations compared to other types of organizations, most notably in *physical activity* and *planning*.

Table 5.8 also describes intensity of involvement across multiple delivery settings and using multiple strategies/methods of delivery. Scores are shown for programming that is risk factor-specific, as well as for programming that combines all these separate risk factor activities into an ‘all-risk factors’ category. Intensity of involvement *across multiple settings* and *using multiple strategies* was highest for addressing a single risk behaviour (*tobacco*), and lowest for ‘all risk factors’ programming. Intensity of involvement *across multiple settings* was highest in Central Canada for most risk factor-specific programming, as well the ‘all risk factors’ programming indicator. Although more intensity of involvement *using multiple strategies* for risk factor specific programming was reported in the East, the highest score for this ‘all risk factors’ type of programming was reported in Central Canada. There was little difference between organization types in intensity of involvement in risk factor-specific programming, but ‘all risk factors’ activity was similar in formally-mandated regional public health organizations and grouped organizations.

Table 5.8 Levels and intensity of involvement in chronic disease prevention and healthy lifestyle promotion in Canada according to provincial grouping and type of organization

	Provincial Grouping					Type of Organization					
	N	Total N=210	West N=74	Central N=84	East N=52	N	Total N=216	PHO N=103	NGO N=54	GO N=41	OTHER N=18
Level of involvement in ... mean (sd)											
Social determinants of health	210	2.4 (0.9)	2.3 (1.0)	2.4 (0.8)	2.7 (0.8)	216	2.4 (0.9)	2.5 (0.8)	2.4 (1.0)	2.4 (0.9)	2.4 (0.8)
Tobacco control	210	3.9 (1.2)	3.5 (1.3)	4.3 (1.0)	3.7 (1.3)	216	3.8 (1.2)	4.1 (1.0)	3.5 (1.5)	3.7 (1.3)	3.7 (1.4)
Healthy eating	210	3.7 (1.1)	3.5 (1.2)	3.9 (1.1)	3.6 (1.0)	216	3.6 (1.1)	3.7 (0.9)	3.5 (1.2)	4.0 (0.9)	2.8 (1.7)
Physical activity	210	3.5 (1.2)	3.2 (1.3)	3.9 (1.1)	3.4 (1.1)	216	3.5 (1.2)	3.4 (1.1)	3.3 (1.3)	4.2 (1.0)	3.4 (1.7)
Stress management	210	2.4 (1.0)	2.3 (1.1)	2.4 (1.0)	2.5 (1.0)	216	2.4 (1.0)	2.5 (0.9)	2.1 (1.1)	2.5 (1.0)	2.2 (1.3)
Population needs assessment	210	3.2 (1.0)	3.4 (1.0)	3.1 (1.0)	3.2 (1.0)	216	3.3 (1.0)	3.3 (0.9)	3.5 (1.1)	2.9 (1.1)	3.3 (1.0)
Identifying relevant practices	210	3.5 (0.8)	3.5 (1.0)	3.6 (0.7)	3.4 (0.8)	216	3.5 (0.8)	3.4 (0.7)	3.4 (0.9)	3.8 (0.8)	3.8 (1.0)
Planning	209	3.6 (0.9)	3.6 (0.9)	3.8 (0.8)	3.4 (0.9)	215	3.6 (0.9)	3.5 (0.8)	3.5 (1.0)	4.1 (0.7)	4.0 (1.0)
Evaluation	209	3.0 (0.8)	3.0 (0.9)	3.1 (0.7)	2.8 (0.8)	215	3.0 (0.8)	2.9 (0.8)	3.0 (0.9)	3.2 (0.6)	3.1 (0.7)

Provincial Grouping						Type of Organization					
	N	Total N=210	West N=74	Central N=84	East N=52	N	Total N=216	PHO N=103	NGO N=54	GO N=41	OTHER N=18
Intensity of involvement across multiple settings in ... ^{†§}											
mean (sd)											
Tobacco control	171	3.5 (1.2)	3.2 (1.2)	3.5 (1.1)	3.8 (1.1)	172	3.5 (1.2)	3.6 (1.2)	3.4 (1.1)	3.3 (1.1)	3.4 (1.5)
Healthy eating	138	3.2 (1.0)	3.1 (0.9)	3.3 (1.0)	3.2 (0.9)	139	3.2 (1.0)	3.3 (1.0)	2.9 (0.9)	3.3 (0.9)	2.5 (0.8)
Physical activity	132	3.0 (1.1)	2.9 (1.3)	3.2 (0.9)	2.7 (1.2)	136	3.1 (1.1)	3.1 (1.1)	2.8 (1.1)	3.3 (1.0)	2.5 (1.4)
Mixed risk factor [†]	186	3.1 (1.0)	2.8 (0.9)	3.3 (0.9)	3.2 (1.1)	190	3.1 (1.0)	3.1 (1.0)	3.3 (0.9)	3.2 (1.1)	2.9 (1.2)
Multiple settings: all risk factors	210	3.0 (1.4)	2.3 (1.3)	3.7 (1.3)	3.0 (1.3)	216	3.0 (1.4)	3.4 (1.3)	2.3 (1.1)	3.4 (1.5)	2.1 (1.2)
Intensity of involvement using multiple strategies in ... [†]											
mean (sd)											
Tobacco control	172	3.5 (1.0)	3.3 (1.0)	3.6 (1.0)	3.9 (1.0)	173	3.5 (1.0)	3.5 (1.0)	3.7 (0.9)	3.4 (1.0)	3.6 (1.0)
Healthy eating	136	3.3 (0.9)	3.3 (0.8)	3.3 (0.9)	3.4 (1.0)	137	3.3 (0.9)	3.4 (0.8)	3.1 (0.9)	3.3 (0.9)	3.0 (0.6)
Physical activity	130	3.2 (0.9)	3.0 (1.1)	3.3 (0.9)	3.2 (0.8)	134	3.2 (1.0)	3.1 (1.0)	3.4 (1.0)	3.4 (0.8)	3.6 (1.1)
Mixed risk factor [†]	185	3.1 (1.0)	3.0 (1.1)	3.0 (0.9)	3.4 (0.9)	189	3.1 (1.0)	3.0 (1.0)	3.4 (1.0)	3.1 (0.9)	3.4 (1.2)
Multiple strategies: all risk factors	210	3.0 (1.4)	2.4 (1.3)	3.7 (1.3)	2.9 (1.4)	216	3.0 (1.4)	3.3 (1.3)	2.3 (1.3)	3.4 (1.5)	2.2 (1.2)

* Scored on a five-point Likert scale: 1 = very low, 2 = low; 3 = moderate; 4 = high; 5 = very high

† N's vary because organizations with mandates that did not include the risk factor were excluded from analysis of that risk factor. This ensured that the analyses would fairly represent outcomes corresponding with organizations' actual mandates. Organizations with mandates that did not exclude, but were not actively working on a specific risk factor, were included and assigned the lowest level of involvement for the analyses of that risk factor

‡ **Mixed Risk Factor** = activities addressing a combination of individual behavioural risk factors with no double counting.

§ For *intensity of involvement across multiple settings* for individual risk factors, items were summed creating a range from 4 to 20. This total was recoded to range from 1 to 5 with 1 = least intensely involved (sum 4-7); 2 = less intensely involved (sum 8-10); 3 = moderately involved (sum 11-12); 4 = highly involved (sum 14-16); 5 = very highly involved (sum 17-20). For intensity of involvement across multiple settings (all risk factors): 16 responses were summed creating a range from 16 to 80. These totals were scaled from 1 to 5 based on quintiles of the cumulative frequency.

¶ For *intensity of involvement using multiple strategies* for individual risk factors, items were summed creating a range from 11 to 55. Total was recoded to range from 1 to 5 with 1 = least intensely involved (sum 11-20); 2 = less intensely involved (sum 21-28); 3 = moderately involved (sum 29-36); 4 = highly involved (sum 37-44); 5 = very highly involved (sum 45-55). For intensity of involvement using multiple strategies (all risk factors): 44 responses were summed creating a range from 44 to 220. These totals were scaled from 1 to 5 based on quintiles of the cumulative frequency.

Discussion

This is the first national survey of organizational capacity in all organizations in Canada that implement programs to reduce the burden of chronic disease. Our data show that the infrastructure for CDP in Canada comprises many different types of organizations, only half of which are in the formal public health system. Further, there is variability across provinces in the structure of the system, with a greater concentration of non-governmental organizations in the West and East, and of grouped organizations in Central Canada. Comprehensive understanding of the public health system in Canada, including increased knowledge about organizational capacity for CDP programming, must take the complexity of this infrastructure into account.

Among core CDP practices, skills for and involvement in evaluation was rated lowest, both across Canada and across types of organizations. Further, supports for evaluation within organizations was rated poorly. Because evaluation is key to providing an evidence-base for best practices in CDP programming, these findings suggest the need for training in evaluation methodology, increased resourcing for evaluation activities, as well as improved funding formulae that recognize and endorse the importance of evaluation (163-164).

Our results on risk-factor specific programming suggest that skills were rated strongest, and level of involvement was highest in regards to tobacco control, physical activity, and healthy eating, both across provincial groupings and organizational types. Skills and involvement were relatively low for programming related to social determinants of health and stress management. These findings may reflect decades of higher priority for, and more intense resourcing of lifestyle risk factor modification programs for which there is a solid evidence base (165-169). However as understanding of the determinants of chronic disease from a broader socio-ecological perspective increases, CDP programming may be lagging in less traditional areas such as social determinants of health. Training of the public health work force, enhanced resourcing, and increased support for intersectoral collaboration with sectors outside health and disciplines not traditionally involved in

public health such as sociology, political sciences, economics, and anthropology, may be needed to enhance organizational capacity in these less traditional areas.

Despite the high level of priority accorded to CDP, resource adequacy and stability of resourcing for CDP were consistently rated as inadequate. Our data suggest that resource challenges may be greatest in the East, although there are more social, economic and health inequities, and higher rates of chronic disease in the East than in the rest of Canada (170). Across types of organizations, resource adequacy was lowest in organizations within the formally mandated public health system. This observation may reflect that in addition to its chronic under-funding, the formal public health system in Canada has had to adjust to significant restructuring in light of regionalisation of health services that began for most provinces in the early 1990s (29). In contrast to organizations in which the primary focus is CDP, the formally-mandated regional public health organizations surveyed in this study were generally divisions or units within larger public health agencies or regional health administrative structures that also undertake activities such as the prevention or control of transmissible disease. Formally-mandated regional public health organizations may have to compete for resources with these other activities and/or a variety of acute care, long-term care, and rehabilitation institutions within the same administrative structure.

In 1986, the Ottawa Charter for Health Promotion (31) advocated multi-level interventions that combine complementary environmental and behavioural components and span multiple settings. Our results suggest that, within the organizations that participated in this study, involvement was greater in activities that address single behavioural risk factors, than in activities that address multiple risk factors concurrently in a variety of settings or using multiple strategies. Further research is needed to determine if this more “siloe” approach to CDP does in fact persist in Canada and if so, what the underlying reasons are.

Limitations

Limitations include that inter-provincial differences were obscured because of the need for confidentiality. Although key informants were those “most knowledgeable about CDP within the organization”, data on organizational characteristics and processes provided by a single person may not reliably reflect the inherent complexity of organizations. Finally, the validity of our conceptual model remains to be tested.

Conclusions

These data provide the first national description of the CDP system in Canada. They identify areas that need improvement, and they provide empirical evidence for calls to build public health capacity (30,171-176)

WHAT IS ALREADY KNOWN ON THIS SUBJECT?

The public health system in Canada is of central importance to chronic disease prevention, but there are few reports that describe involvement in chronic disease programming within the system, and even fewer that focus on its capacity to deliver effective chronic disease prevention programs.

WHAT DOES THIS STUDY ADD?

This study shows that the infrastructure for chronic disease programming in Canada comprises many different types of organizations. Involvement in, and skill levels, were highest for programming related tobacco control and healthy eating; and lowest for stress management, social determinants of health, and program evaluation. Adequacy of resources for chronic disease prevention programming was perceived as low across the country. Strengths and gaps in organizational capacity identified in this study will help guide strategic investment in the public health system.

5.5 PREAMBLE MANUSCRIPT 3

There are very few empirical reports that describe how dissemination of CDP innovations occurs within the preventive health system. In the third manuscript presented in this thesis, we introduce a new conceptual model that describes the process of dissemination within resource organizations engaged in CDP, and we describe the development of reliable measures of dissemination of CDP innovations and of the potential correlates of dissemination. We describe levels of dissemination across three types of resource organizations engaged in CDP in Canada, and we identify the independent correlates of dissemination in resource organizations in the Canadian preventive health system. The independent correlates identified in this manuscript are all potential targets for interventions to improve dissemination practices which in turn may improve the effectiveness of the preventive health system.

This paper has been submitted to *Social Science & Medicine* and is included in this thesis with permission from all co-authors (Release Form – Appendix 12)

5.6 MANUSCRIPT 3

A national survey of dissemination practices in chronic disease prevention organizations in Canada

Nancy Hanusaik¹, Jennifer L O'Loughlin²⁻⁴, Gilles Paradis^{1,4,5}, Natalie Kishchuk⁵

¹ Department of Epidemiology, Biostatistics and Occupational Health, Faculty of Medicine, McGill University, Montréal, Québec, Canada

² Department of Social and Preventive Medicine, University of Montreal, Montréal, Québec, Canada

³ Centre de recherche du Centre hospitalier de l'Université de Montréal, Montréal, Québec, Canada

⁴ Institut national de santé publique du Québec, Montréal, Québec, Canada

⁵ McGill University Health Centre Research Institute, Montréal, Québec, Canada

⁶ Natalie Kishchuk Evaluation & Research Inc, Kirkland, Québec, Canada

ABSTRACT

Despite a growing literature that views dissemination of innovations (i.e., programs, practices, policies, concepts) as crucial to effective chronic disease prevention (CDP), little is known about how dissemination occurs within the public health system. Few studies describe practices that comprise the dissemination process from the perspective of organizations that develop and transfer CDP innovations (i.e., resource organizations) to other organizations (i.e., user organizations), and there are few systematic studies that identify factors associated with dissemination. Cross-sectional data were collected in a national survey (October 2004-April 2005) of all public health organizations engaged in CDP across Canada. Structured telephone interviews were conducted with the person most knowledgeable about dissemination of CDP innovations in 77 resource organizations. Principal components analyses were used to develop reliable measures of the dissemination process and its potential correlates. Levels of 13 dissemination practices were compared across three types of organizations (public health, NGO and grouped organizations). Independent correlates of dissemination were identified in multiple linear regression. Dissemination practices most heavily engaged in included: *Identification of barriers to adoption/implementation* of the innovation, *tailoring dissemination strategies* and *design of dissemination plan*. There was little similarity across organizations in the number or types of dissemination practices engaged in. *Skill at planning/implementing dissemination*, *external sources of funding specifically allocated for dissemination of innovations*, *type of organization*, *attitude toward the process of collaboration*, and *user-centeredness* were all positively associated with dissemination ($R^2=0.42$; F value 8.20, $p<0.0001$). These data provide the first national description of dissemination practices within Canadian public health organizations. Factors associated with dissemination represent possible targets for interventions to improve dissemination.

INTRODUCTION

Reducing the chronic disease burden in Canada depends in part on having effective health promotion and chronic disease prevention (CDP) programs and “best practices” in place within the public health system (7). However many promising programs fail to have impact because plans or activities to disseminate these programs across public health organizations are not well-developed (77,78-79). Limited CDP resources can be wasted when effective programs are not appropriately disseminated (177).

While definitions vary, dissemination as defined herein is a deliberate planned process to transfer an innovation (i.e., a program, practice, policy, practice aid) from an organization that produced the innovation (termed “resource organization”) to organization(s) that will adopt and implement the innovation (termed “user organization”) (80-81). This process is in contrast to diffusion, a passive, unplanned spread of an innovation (82) which is largely ineffective in influencing practice (83-84).

Despite a growing literature that views dissemination as crucial to effective CDP (79,85-86), little is known about how dissemination of innovations occurs within the public health system from the perspective of the resource organization. Furthermore, few studies describe specific practices that comprise the dissemination process, and there are few systematic studies that identify factors associated with dissemination. Increasing our understanding of dissemination is critical to improving dissemination efforts, which in turn can improve the effectiveness of the preventive health system.

Efforts to describe the dissemination process in public health organizations are challenged on at least five levels. First, the literature in this area is widely dispersed across disparate disciplines (i.e., agriculture, social sciences, business administration, education, health sciences) and indexed inconsistently in electronic databases, making synthesis of information and comparison across studies difficult. Second, research on dissemination has involved many types of diverse innovations including concepts, technologies, practices, practice tools, and programs, a wide variety of resource and user

populations, and different units of analyses. Third, there is no consensus on the definition of “dissemination,” or on how much of the innovation development, transfer, uptake, and utilization continuum should be included under this rubric. Uptake and utilization (often conceptualized as adoption and implementation) that occurs within user organizations can be included in dissemination definitions, along with the earlier stages of innovation development and transfer generated by resource organizations (77,87). Other definitions of dissemination refer to activities occurring solely within user entities (88). Fourth, qualitative work has predominated in this area, and although informative in terms of rich descriptive and locally meaningful information, qualitative findings do not lend themselves to generalization across organizations or jurisdictions. Quantitative data are needed to support qualitative work and to provide decision-makers with standardized tools for measuring, managing, and improving dissemination efforts by public health organizations. Finally, most of the literature focuses on the recipients of dissemination efforts (i.e. user organizations) and on the determinants of innovation adoption and implementation. There are few models of dissemination that focus on resource organizations.

The specific aims of this paper are threefold. First, we introduce a new conceptual framework that describes the process of dissemination within resource organizations engaged in CDP. Second, we describe the development of quantitative measures of dissemination practices and potential correlates of dissemination. Finally we describe dissemination practices in organizations engaged in primary CDP across Canada, and we identify independent correlates of dissemination.

Conceptual Framework

Figure 2.3 describes a conceptual framework of the dissemination process from the perspective of resource organizations. The framework depicts the resource organization as the entity that conceptualizes and develops innovations with the intent to disseminate these to targeted user organizations that then adopt and implement them in a specific population. The resource organization and the user organization(s) are situated in a context of two-way exchange (89,92-93,95-96,109), which emphasizes (i) the importance of interaction between producers and users in developing innovations that are relevant to users and the populations they serve, as well as in designing dissemination plans that will result in successful adoption, implementation, and institutionalization; and (ii) developing a linkage system or means to exchange knowledge and ideas (95-96). Theoretically at least, linkage helps developers at every stage of the dissemination process by allowing users a means or process to express needs, expectations and potential limitations of the innovation (89,94,96).

The nine practices depicted in the model as comprising the dissemination process, draw on several models of planned change (78,100-102), which describe the phases undertaken by change agents as they try to alter the structure and/or functioning of a user system (usually termed “the client”) to address its perceived needs or problems. These practices take into account activities intended to improve the outcome of dissemination, which is generally viewed as the adoption and implementation of innovations by user organizations. Specifically the practices address: (i) the users’ perceptions of the attributes of the innovation being developed (90-91,103); (ii) the characteristics of the user organization (80,105,108-109,111); (iii) the relationship between resource and user organizations (89,94-96,100,121); and (iv) the method or strategy used to disseminate the innovation (77,89,100,109,116,118-121). These practices do not necessarily need to take place sequentially, although decisions about or results of one activity could have direct effects on other activities (94).

Potential correlates of dissemination stem from Havelock's synthesis of the dissemination and utilization literatures (89) and Huberman's "dissemination effort model" (109). The seven types of potential correlates depicted in the model include: (i) user-centeredness of dissemination efforts (i.e., the extent to which the resource organization takes users needs into account); (ii) the age, size and type (i.e., referred to summarily as "structure") of resource organization; (iii) the openness or orientation toward dissemination (i.e., readiness to be influenced by user feedback and new scientific knowledge; renewal of skills); (iv) organizational capacity (i.e., skills and resources) to undertake dissemination; (v) incentives to disseminate (i.e., reward for investment in dissemination activities in terms of dollars, recognition by colleagues, knowledge, self-esteem, satisfaction in creating something that works, feedback from a satisfied client, feeling of job well done); (vi) organizational flexibility to adjust dissemination efforts in a multi-sectoral user context); and (vii) organizational commitment to dissemination (i.e., number and diversity of resource people who gain access to the user; persistence of leadership for dissemination).

The process of adoption and implementation by user organizations is not detailed in this framework because the focus of this paper is on the dissemination process within resource organizations. Also this framework assumes that the innovations being disseminated have been evaluated and found to be effective.

METHODS

Questionnaire development

With the exception of three items adapted from earlier measures of organizational practices/activities for (heart) health promotion (126,128), items to measure dissemination practices and correlates of dissemination were developed de novo drawing from the literature on knowledge transfer, utilization, and dissemination (82,88-89,94,109,116,121,150,151), planned social or organizational change (101,102), and educational intervention research (100). The content validity of all items was tested with four researchers recognized nationally for their work in chronic disease health policy, health promotion, public health and dissemination. We pre-tested a questionnaire that

included all items retained with public health researchers and practitioners working in areas including HIV/AIDS prevention, injury prevention, and preventive dental health care. Finally we pilot tested a revised version of the questionnaire in 11 organizations that delivered prevention activities unrelated to CVD, diabetes, chronic respiratory diseases, or cancer. Pilot test key informants included executive directors and program or evaluation staff from public health departments, resource centers, or non-profit organizations with mandates for infectious disease, injury prevention, or health and development of children. Two francophone translators translated the questionnaire from English into French. Equivalence between the source and target language versions was verified according to recommendations for cross-cultural adaptations of health measures (124-125).

To anchor responses and assist recall, key informants were instructed to provide responses to several items referring to the innovation (i.e., the chronic disease prevention/healthy lifestyle promotion program, practice, campaign or other activity) that their organization had most recently disseminated within the last three years. It was assumed that the most recent disseminated innovation would represent the organization's current dissemination practices. This "reference innovation" was: (i) completely new, newly adapted from an existing program, practice, campaign or activity, or part of a larger new or newly adapted program; (ii) focused on primary prevention; (iii) developed with the intent to disseminate to other organizations that work with large groups or populations; and (iv) completely disseminated or had reached a sufficiently advanced stage in the dissemination process to allow the key informant to fully reflect on the experience.

The final version of the questionnaire comprised 237 items covering: (i) organizational characteristics (7 items); (ii) dissemination practices (72 items); (iii) descriptions of the “reference” innovation (42 items); (iv) factors affecting dissemination practices (109 items); and (v) key informant characteristics (7 items). Response sets included yes/no, numeric options, and five-point Likert scales, with degree or extent or agreement response formats ranging from ‘1’ (very low/strongly disagree) to ‘5’ (very high/strongly agree).

Census of CDP Organizations

To identify organizations for inclusion in the survey, we undertook a complete census of all regional, provincial, and national organizations across Canada with mandates for the primary prevention of chronic disease including diabetes, cancer, CVD and chronic respiratory illness, and/or promotion of healthy eating, non-smoking, or physical activity. The census targeted both user organizations (i.e., those that adopt CDP innovations to deliver these innovations in specific populations) and resource organizations (i.e. those that develop and disseminate CDP innovations to user organizations). Specifically, government departments, regional health authorities, public health units, non-governmental organizations (NGOs) and their provincial/regional divisions, para-governmental health agencies, resource centers, professional organizations, and coalitions, alliances and partnerships, were identified in an exhaustive Internet search and through consultations with key contacts across Canada. All 353 organizations identified were invited to participate in the survey. Initial screening interviews were conducted with senior managers to confirm that the organization met the eligibility criteria for inclusion, to solicit participation, and to obtain contact information for potential key informants. Eligibility criteria included that the organization: (i) was mandated to undertake primary prevention of chronic disease; (ii) was involved in developing/adopting CDP innovations; (iii) had disseminated one or more innovations to other organizations in the past three years or had implemented the innovations in a specific target population.

Data collection

Data on dissemination practices and correlates of dissemination were collected in structured telephone interviews (mean length 68 ± 22 minutes) with individuals in resource organizations identified by a senior manager as most knowledgeable about dissemination of CDP programs, practices, campaigns, or activities. One interview was conducted per organization except when senior managers identified more than one autonomous division or branch within the organization that conducted CDP activities. In these organizations, interviews were conducted with one knowledgeable person in each autonomous division. Interviews were conducted in English or French, from October 2004 to April 2005, by nine trained interviewers. Key informants included senior/middle managers, service providers, and professional staff. A copy of the questionnaire was emailed to key informants prior to the interview to allow for preparation and consultation with colleagues. Random monitoring of interviews by NH or NK was conducted for quality control. Inconsistencies and incomplete data were resolved in telephone calls or e-mails.

Study Variables

Study variables measuring each construct depicted in the conceptual model comprised single items, scales developed using PCA and arithmetic scores created from multiple yes/no items.

Dissemination

The 13 variables measuring dissemination practices included the following: *identification of the need for the innovation* (1 item); *development of a linkage system* (arithmetic score - 24 items); *collaboration* between resource and user organizations *during development* of the innovation (1 scale); *collaboration* between resource and user organizations *during transfer* of the innovation (i.e., actual handing over of the innovation) (1 scale); *collaboration* between resource and user organizations *during evaluation* of the dissemination process (1 item); *identification of barriers to adoption and implementation* of the innovation by the user organization (1 item); *identification of facilitators to*

adoption and implementation of the innovation by the user organization (1 item); *selection of strategies* to overcome barriers or to promote facilitators (arithmetic score - 12 items); *tailoring dissemination strategies* to individual user organization(s) (1 item); *design of dissemination plan* (1 scale); *enhancement of user capacity* to adopt and implement the innovation (arithmetic score - 9 items); *fidelity to dissemination plan* (1 item); and *evaluation of dissemination process* (arithmetic score - 7 items). A detailed description of these measures including their psychometric properties is provided in Appendix 9.

Potential Correlates

The seven types of potential correlates depicted in the conceptual model were measured using 23 study variables. These study variables related to: i) structure of the resource organization - five variables measuring *age* of organization, *type of organization* [(formally-mandated regional-level public health organizations, non-governmental organizations (including health charities, other non-governmental organizations and non-profit organizations), grouped organizations, and others (including para-governmental agencies, professional associations, resource centers, federal/provincial government departments)], *size of organization* (number of paid full time equivalents at the organization or CDP division level, number of volunteers); *geographic level served* (national, provincial, multi-province, regional), and *national region location/jurisdiction* (East, Central, West, Canada); ii) user-centeredness of dissemination efforts – one variable measuring *user-centeredness* (1 scale); iii) openness/orientation toward dissemination -four variables measuring *attitude toward process of collaboration* (1 scale), *attitude toward linkage* (1 scale), *organizational support for professional development in dissemination* (1 item), *frequency of professional development in dissemination* (1 item); iv) capacity - five variables measuring *skill at planning/implementing dissemination* (1 scale), *skill at evaluating dissemination* (1 scale), *skill at collaborating with user organizations* (1 scale), *adequacy of resources for dissemination* (1 scale), *external sources of funding specifically allocated for dissemination of innovations* (arithmetic score - 11 items); v) incentives to disseminate – three variables measuring *dissemination incentive in the form of job satisfaction* (1 scale),

dissemination incentive in the form of professional recognition (1 scale), *dissemination incentive in the form of access to funding* (1 item); vi) organizational flexibility – one variable measuring *user type diversity* (arithmetic score - 11 items); vii) organizational commitment to dissemination – three variables measuring *designated person in charge of dissemination* (1 item), *championing of dissemination* (1 item), *dissemination considered part of job* (1 item). A detailed description of these variables including psychometric properties is provided in Appendix 9.

Data were entered into a database management system developed by DataSpect Software, Montreal, Quebec. All data entries were verified for accuracy by one investigator (NH).

Data analysis

Principal components analysis

We undertook psychometric analyses to create reliable and parsimonious study variables and to assess the unidimensionality and internal consistency for each subset of items intended to measure dissemination practices or correlates of dissemination. To determine if principal components analysis (PCA) was an appropriate analytic option, we undertook the following checks: (i) assessment of normality in individual items; (ii) verification of absence of outliers; and (iii) examination of patterns of missing data (137). No imputation of missing data was required because few data were missing. All Bartlett's tests of sphericity achieved statistical significance, and all Kaiser-Meyer-Olkin coefficients were ≥ 0.6 , showing that the data were appropriate for PCA analysis. The principal components method with varimax rotation was used to extract factors with eigenvalues greater than 1. Decisions about the number of factors to retain were based on Cattell's Scree Test (140) and the number of factors needed to account for $\geq 50\%$ of the variance in the measured variables (139).

Items with factor loadings ≥ 0.55 were retained to construct unit-weighted scales, with stipulation that an item could not be retained in more than one factor, that each factor contained a minimum of three items, and that items loading on a given factor shared the same conceptual meaning (138). Items that did not fit these criteria were treated as

single-item measures (n=2) or dropped (n=5) if they did not represent a key concept in the conceptual framework. A total of 56 items were entered into PCA. Twelve multi-item scales and 2 single item measure were developed using PCA.

Cronbach's alpha (143) and mean inter-item correlations (144) were computed to measure internal consistency. The range and distribution of individual inter-item correlations were examined to confirm unidimensionality (144). Interpretive labels were assigned to each scale. Factor based scores for each scale were computed only for organizations that provided data for at least 50% of items that loaded on the scale. For these organizations, responses for the items in the scale were summed and then divided by the number of items completed to maintain the score in the original response range from one to five.

PCA-based scale construction was not appropriate when items selected to measure a dissemination practice or potential correlate did not share the same response categories, did not represent one single underlying construct or had dichotomous response sets. Four dissemination practice variables and two correlate variables comprised several yes/no items. For each of these variables, all positive responses were summed. In the case of the dissemination practice variables, the cumulative frequency was quintiled, then the rankings were re-coded to create a score from 1 to 5.

Creation of dependent variable for multiple linear regression analysis

We created a summary dissemination score (hereafter referred to as DISSEMINATION) using the scores for each individual dissemination practice, to reflect the comprehensiveness of the dissemination process. Eight dissemination practice scores were based on 5-point Likert scales. Four practice scores were based on 5 point scales derived from a quintiled frequency distribution of summed positive responses to a series of yes/no items. One practice score was based on a dichotomous scale. DISSEMINATION was the arithmetic sum of the 13 practice scores. In order for the one dichotomous score to provide adequate weight, a linear transformation was performed to transform it from a 0/1 scale to 2/4.5 scale. DISSEMINATION ranged from 30 to 61 (mean (sd) = 44 (8); median = 44).

Descriptive statistics

Initial descriptive checks of the data included examination of the frequencies for categorical variables, means for dissemination practice scales/scores or medians for skewed count variables. Organizations were labeled, “heavily engaged” in a dissemination practice if the practice score: (i) equaled ‘4’ or ‘5’ on a 5-point Likert scale or the quintiled ranking of the cumulative frequency or (ii) was a positive response to the dichotomous practice score.

Identification of independent correlates

Multiple linear regression analysis was used to identify independent correlates of DISSEMINATION. Potential correlates significant at $p \leq 0.20$ in univariate analyses were entered into the preliminary multivariate model simultaneously. Those correlates identified as significant at $p = 0.05$ in backward selection, stepwise and all subsets automated selection strategies were retained in the final model. Residual plots were inspected to verify linearity, normality, and homoscedasticity assumptions. Collinearity was assessed based on tolerance statistics and eigenvalues. Jackknife residuals and Cook’s D statistics were used to identify potential outliers and influential observations. Split-sample cross validation was used to verify the performance of the final model in an “independent sample”, i.e. validation in two random sub-samples. Strength of clustering

in the data by province was measured by the intra-class correlation coefficient (153). A Generalized Estimating Equation procedure with exchangeable covariance structure was used to fit the regression equation to take any clustering into account and adjust the regression coefficients and standard errors accordingly.

Data analyses were conducted using SAS software, version 8.2 (SAS Institute, Inc, Cary, North Carolina) and SPSS software release 11 (SPSS Inc, Chicago, Illinois). This study was approved by the Institutional Review Board of the Faculty of Medicine of McGill University.

RESULTS

Sixty-eight organizations were not eligible to participate because they provided secondary prevention (n=3); they targeted Aboriginal populations only (n=1); or they were primarily involved in advocacy (n=10), allocation of funds, fund-raising, facilitation of joint efforts among organizations, research, or knowledge transfer (n=54). Five organizations could not be reached and were never screened. Of 280 organizations screened and eligible, 58 were resource organizations, 188 were user organizations, and 34 reported both user and resource activities and were labeled 'both'. Nineteen eligible organizations declined to participate (8 user; 9 resource; 2 both). The response proportion among resource and user organizations was 88% and 96%, respectively.

The 92 organizations reporting "resource" activities represent a complete census of all CDP resource organizations in Canada in 2004. Data were collected in 81 of these resource organizations in a total of 77 interviews due to scheduling constraints. The number of interviews in the ten provinces ranged from 1-17 (mean per province = 10, median = 7 per province).

Approximately one-third of all resource organizations across Canada were formally-mandated regional public health organizations (Table 5.9). Non-governmental organizations comprised another one-third and only 11% were grouped organizations. The median age of organizations was 20 years. The median number of paid staff was 12.5

full time equivalents. Over half (52%) of organizations described the province as their target territory.

Twenty percent of organizations used a training or professional development program or activity as the “reference innovation”; 20% referred to a resource or practice tool kit; and 13% referred to a community-based program. Innovations less frequently referred to included: approaches/frameworks (7% of organizations); strategies (4%); and policies (3%).

Table 5.9 Characteristics of resource organizations (n=77) engaged in dissemination of innovations related to chronic disease prevention, in Canada

Organizational Characteristic	
Type of Organization*, (%)	
Formal Public Health	31.2
Nongovernmental	34.8
Grouped	11.7
Other	23.3
Age, median (range)	
No. years	20.0 (2 -150)
Size, median (range)	
No. FTEs at organization level [†]	25.7 (0 – 27,000)
No. FTEs at CDP unit/division level [†]	7.0 (0.5 – 329)
No. FTEs [‡]	12.5 (0 - 27,000)
Usual no. volunteers per year	12.0 (0 – 6150)
Maximum no. volunteers per year	45.0 (6 – 15,000)
Geographic Area Served, (%)	
Regional	37.7
Provincial	52.0
Multi-province/territory	1.3
National	9.0

* Formal Public Health =formally mandated regional public health organizations such as regional health authorities/districts, agencies; Non-governmental=non-governmental organization, national health charity, non-profit organization; Grouped = Coalition, Partnership, Alliance, Consortium; Other=para-governmental, professional association, resource centre, federal or provincial government dept

[†] FTEs=Full time equivalents

[‡] “No. FTEs” variable (n=74) was created by utilizing responses from “No. FTEs at organizational level” (n=60) and “No. FTEs at CDP unit/division level” (n=46). If “No. FTEs at organizational level” was NOT missing then “No. FTEs” = “No. FTEs at organizational level”; if “No. FTEs at organizational level” WAS missing and “No. FTEs at CDP unit/division level” was NOT missing then “No. FTEs” = “No. FTEs at CDP unit/division level”.

^{||} Usual no. volunteers per year: n=64; Maximum no. of volunteers per year: n=31

Table 5.10 describes the proportion of organizations heavily engaged in or heavily endorsing each of the 13 dissemination practices. *Identification of barriers to adoption/implementation of innovation by user, tailoring dissemination strategies and design of dissemination plan* were most heavily engaged in. The least endorsed practices included *fidelity to dissemination plan, selection of strategies to overcome barriers/promote facilitators, evaluation of dissemination process, development of a linkage system, and enhancement of user capacity* to adopt/implement the innovation.

In sub analyses examining the total number of practices heavily endorsed per organization, there were five organizations that did not heavily engage in any practice; and none of the organizations surveyed were heavily engaged in all 13 dissemination practices. The majority of organizations (57%) reported “heavy engagement” in fewer than five dissemination practices. Among organizations that reported the same number of practices heavily engaged in, there were no systematic patterns in the types of practices endorsed.

There were few notable differences in dissemination practices heavily engaged in across type of organization, although PHOs were more heavily engaged than NGOs or GOs in *evaluation of dissemination process, enhancement of user capacity and collaboration during transfer*. In addition, GOs were least engaged in *collaboration during evaluation and identification of barriers to adoption/implementation*.

Table 5.10 Proportion of resource organizations heavily engaged in* specific dissemination practices by type of organization

Dissemination Practice	Type of Organization				
	Total %	Public Health %	NGO %	Grouped %	Other %
Identification of the Need for the Innovation †	68	67	69	67	71
Development of a Linkage System ‡	39	42	35	33	47
Collaboration During Development§	51	46	46	55	62
Collaboration During Transfer §	57	71	42	33	75
Collaboration During Evaluation §	42	54	36	11	50
Identification of Barriers to Adoption/Implementation	83	87	81	67	88
Identification of Facilitators to Adoption/Implementation	70	71	61	78	76
Selection of Strategies to Overcome Barriers/Promote Facilitators‡	34	25	31	33	53
Tailoring Dissemination Strategies§	76	75	73	78	82
Design of Dissemination Plan§	75	79	65	67	88
Enhancement of User Capacity ‡	39	50	19	11	71
Fidelity to Dissemination Plan [¶]	28	37	23	33	18
Evaluation of Dissemination Process‡	35	46	19	11	59

* “Heavily engaged” denotes dissemination practice score = ‘4’ or ‘5’ on a 5-point Likert scale or quintiled ranking of cumulative frequency or positive response on a dichotomous variable. Depending on wording of Likert response scale, “heavily engaged” would be interpreted as “heavily endorsing” a particular dissemination practice

† Scored on a 5-point Likert scale: 1= Never Involved; 5=Extensively involved

‡ Arithmetic sum, quintiled and re-coded from 0 - 4 to 1 - 5.

§ Scored on a 5-point Likert scale: 1=Strongly disagree; 2=Disagree; 3=Neutral; 4=Agree; 5=Strongly agree

|| Scored on a 5-point Likert scale: 1=Not at all; 5=Completely

¶ Originally this variable was dichotomous (scored 0/1) while all other dissemination practices were scored 1 to 5. In the summative score that created to serve as the dependent variable, this dichotomous variable did not provide adequate weight respective of other practices therefore a linear transformation was performed to re-code it from 0/1 to 2/4.5.

Based on the results of univariate analyses, 11 of 23 potential correlates of dissemination were entered into automated model selection procedures (Table 5.11). These included the following nine variables: *skill at planning/implementing dissemination*; *external sources of funding specifically allocated for dissemination of innovations*; *attitude toward process of collaboration*; *user-centeredness*; *attitude toward linkage*; *dissemination incentive in the form of professional recognition*; *frequency of professional development in dissemination*; *organizational support for professional development in dissemination*; and *organizational size*. Two indicator variables created to recode discrete variables with more than two categories and entered into automated selection included: *organizational type* and *national region location/jurisdiction*.

All automated selection procedures used to identify independent correlates of dissemination in the multivariate analysis yielded identical results (Table 5.12). Variables measuring four of the seven types of potential correlates contributed significantly to explaining the variance in dissemination. *Skill at planning/implementing dissemination* (capacity-skills), *external sources of funding specifically allocated for dissemination of innovations* (capacity-resources), *type of organization* (structure of resource organization), *attitude toward process of collaboration* (openness/orientation toward dissemination), and *user centeredness* (user-centeredness of dissemination efforts) were all positively associated with dissemination. The variables included in the final model explain 42% of the variation in dissemination (F value 8.20, $p < 0.0001$). The results of the cross-validation showed minimal discrepancy between R^2 values for the estimation sample (0.39) and the cross-validation sample (0.36). A large discrepancy would indicate overfitting, which does not appear to be the case for this model. Although the results of our analysis did not demonstrate any important clustering (ICC=0.06), regression coefficients and model-based standard errors presented are those derived using GEE. These parameter estimates are interpreted as population average estimates.

Table 5.11 Mean DISSEMINATION scores across categories of potential correlates, and parameter estimates of potential correlates obtained in the simple linear regression models using DISSEMINATION as the dependent variable

Potential Correlates	N	DISSEMINATION Mean (sd)	Parameter estimate (CI)	p-value	R ²
Structure of resource organization					
Age [*]					
≤ median (20 years)	42	44.0 (7.8)	-0.1 (-3.7, 3.6)	0.97	0.0000
> median	34	43.1 (7.4)			
Type of organization [†]					0.11
NGO/Grouped	35	41.1 (6.8)	Reference		
PHO	24	44.8 (7.8)	1.6 (-2.1, 5.4)	0.38	
Other	17	47.3 (7.4)	4.7 (0.6, 8.7)	0.02	
No. FTEs [*]			1.0 (-0.7, 2.7)	0.24	0.02
≤ median (12.5)	39	42.9 (6.5)			
> median	37	44.4 (8.6)			
Volunteers per year [†]					0.01
≤ 12	33	43.0 (6.9)	Reference		
Missing	13	45.6 (8.2)	2.3 (-2.3, 6.9)	0.31	
> 12	30	43.5 (8.1)	-0.20 (-3.8, 3.4)	0.91	
Geographic level served [‡]					
Regional, multi-province, whole nation	37	43.4 (7.7)	Reference		0.0007
Province	39	43.8 (7.6)	0.4 (-3.1, 3.9)	0.82	

Potential Correlates	N	DISSEMINATION Mean (sd)	Parameter estimate (CI)	p-value	R ²
National region location/jurisdiction [†]					0.05
Central	31	42.2 (7.6)	Reference		
West	24	45.7 (8.0)	3.0 (-0.7, 6.7)	0.11	
East	14	44.6 (5.9)	1.1 (-3.4, 5.6)	0.61	
National	7	41.2 (8.6)	-2.7 (-8.7, 3.3)	0.38	
Openness/orientation toward dissemination §					
Attitude toward linkage			2.2 (-0.4, 4.8)	0.09	0.04
1-2	1	44.5			
3	11	39.4 (6.7)			
4-5	64	44.3 (7.6)			
Attitude toward process of collaboration			3.1 (0.6, 5.6)	0.01	0.08
1-2	2	46.5 (4.9)			
3	15	38.0 (7.0)			
4-5	59	45.0 (7.2)			
Organizational support for professional development in dissemination §			1.00 (-0.5, 2.5)	0.19	0.02
1-2	10	40.1 (8.2)			
3	12	43.7 (7.0)			
4-5	53	44.2 (7.6)			

Potential Correlates	N	DISSEMINATION Mean (sd)	Parameter estimate (CI)	p-value	R ²
Frequency of professional development in dissemination (past 3 years)					0.03
0 times	25	42.5 (7.9)	Reference		
1 time	10	43 (5.6)	-0.73 (-5.9, 4.4)	0.78	
2-3 times	23	42.8 (6.7)	-1.13 (-4.9, 2.7)	0.55	
≥ 4 times	16	46.4 (9.4)	3.5 (-0.7, 7.7)	0.11	
Dissemination incentives in the form of^s					
Job satisfaction			0.6 (-2.7, 3.8)	0.72	0.001
1-2	0	-			
3	2	52.0 (3.5)			
4-5	73	43.4 (7.6)			
Professional recognition			1.2 (-0.7, 3.1)	0.20	0.02
1-2	11	42.1 (7.0)			
3	22	43.1 (6.8)			
4-5	42	44.2 (8.2)			
Access to funding			0.7 (-1.4, 2.8)	0.52	0.01
1-2	3	44.3 (6.5)			
3	8	39.1 (8.5)			
4-5	64	44.1 (7.5)			

Potential Correlates	N	DISSEMINATION Mean (sd)	Parameter estimate (CI)	p-value	R ²
Organizational capacity (skills)[§]					
Planning/implementing dissemination					
1-2	2	33.3 (3.9)	2.7 (0.1, 5.3)	0.04	0.06
3	14	39.1 (7.7)			
4-5	59	45.0 (7.1)			
Evaluating dissemination					
1-2	4	45.4 (7.4)	0.2 (-2.1, 2.6)	0.84	0.001
3	19	40.9 (6.8)			
4-5	52	44.4 (7.8)			
Collaborating with user organizations					
1-2	0	-	0.8 (-2.8, 4.5)	0.65	0.003
3	4	34.0 (3.0)			
4-5	71	44.1 (7.5)			
Organizational capacity (resources)					
No. external sources of funding specifically allocated for dissemination			2.0 (0.8, 3.2)	0.002	0.13
0	42	41.9 (6.5)			
1-3	30	44.6 (8.2)			
4-7	4	54.2 (2.9)			

Potential Correlates	N	DISSEMINATION Mean (sd)	Parameter estimate (CI)	p-value	R ²
Adequacy of resources for dissemination [§]			-0.9 (-3.1, 1.2)	0.38	0.01
1-2	15	44.9 (6.8)			
3	35	43.4 (8.5)			
4-5	24	43.1 (7.1)			
User-centeredness [§]			5.0 (2.7, 7.3)	0.0001	0.18
1-2	1	30.5			
3	16	35.2 (5.2)			
4-5	59	42.3 (7.4)			
Organizational commitment to dissemination					
Designated person in charge of dissemination			1.4 (-2.4, 5.2)	0.47	0.01
No	52	43.2 (8.4)			
Yes	23	44.6 (5.5)			
Dissemination considered part of job [§]			1.0 (-1.2, 3.2)	0.36	0.01
1-2	2	39.5 (8.5)			
3	11	41.2 (6.5)			
4-5	62	44.1 (7.8)			
Championing of dissemination [§]			0.5 (-1.8, 2.8)	0.66	0.003
1-2	2	47.2 (3.2)			
3	9	42.0 (10.3)			
4-5	64	43.7 (7.4)			

Potential Correlates	N	DISSEMINATION Mean (sd)	Parameter estimate (CI)	p-value	R ²
Organizational flexibility					
User type diversity			0.1 (-0.6, 0.7)	0.86	0.0004
1-3 types	20	43.7 (7.0)			
4-7 types	38	43.3 (8.0)			
8-11 types	18	44.2 (7.7)			

* Log transformation was performed prior to simple linear regression because of positively skewed distribution.

† Reference category for all indicator variables created to recode discrete variables with more than two categories was the category with the largest n.

‡ Originally *geographic level served* had 4 levels: regional (n=29), multi-province (n=1), Canada (n=7), and province (n=40). Created a dichotomous variable (G1) by combining regional, multi-province, and Canada to give a category size of 37 (which I set as the reference or G1=0) vs 40 (G1=1) and thereby bringing the variable close to maximum variance, i.e. 50:50.

§ Higher scores indicate more favorable dissemination practice situations

Table 5.12 Unstandardized regression coefficients (95% confidence intervals) for variables retained as independent correlates of dissemination in multivariate linear regression (n=75)

Independent Variable	GEE Parameter Estimate *	95% Confidence Interval
Intercept	4.3	-8.8, 17.4
Skill at planning/implementing dissemination	2.3	0.1, 4.5
External sources of funding	1.4	0.3, 2.4
Type of organization		
NGO + Grouped	Reference	
PHO	3.1	0.1, 6.2
Other	4.4	0.7, 8.0
Attitude toward the process of collaboration	2.4	0.4, 4.5
User-centeredness	3.7	1.6, 5.7

* Parameter estimates obtained from Generalized Estimating Equations (GEE) analysis and model-based (exchangeable co-variance structure) standard error estimates; $R^2 = 0.42$; F value 8.20, $p < 0.0001$

DISCUSSION

Summary

There are major gaps in knowledge on how resource organizations within the Canadian public health system disseminate CDP innovations to organizations that will adopt and implement them. These gaps relate to the lack of a widely accepted conceptual model of the dissemination process, few reliable instruments to measure relevant aspects of this process, and little understanding of the dissemination process from the perspective of resource organizations. Using data from the first national survey of dissemination practices in Canada, we propose a series of psychometrically sound measures to enable investigation of this process, we describe the frequency of engagement in the practices related to dissemination, and we identify correlates of dissemination undertaken by resource organizations engaged in innovation development for primary chronic disease

prevention. The empirical evidence provided in this study generally supports our conceptual model, at least as a “simple” backbone to further investigating what is undoubtedly a very complex process that is variable across organizations.

Dissemination Practices

Each of the 13 dissemination practices investigated was heavily endorsed or engaged in by at least one-quarter of resource organizations, providing empirical evidence organizations actually recognized that these practices exist and that they are relevant to what they do. However, there was little similarity across organizations in the number or types of dissemination practices engaged in. More specifically, the number of practices heavily engaged in differed widely across organizations, and there did not seem to be any systematic patterns in terms of the co-occurrence of specific practices. This diversity could reflect that, to date, the literature in this area is underdeveloped so that there is no general discourse and more specifically, there are no widely accepted guidelines on how to disseminate innovations. With no “evidence-based” guidelines, resource organizations may lack knowledge on what constitutes an optimal set and sequence of activities for comprehensive dissemination. Practices engaged in may represent those that seem easiest to accomplish or that can be implemented given resources available. For example, understanding the context in which the innovation will be adopted and implemented appears to be important, as evidenced by the high proportion of organizations engaged in identifying barriers to adoption/implementation of the innovation by user. However, enhancing existing user capacity to adopt/implement the innovation was not as heavily endorsed, possibly because user capacity may not be seen as a responsibility of the resource organization or, to engage in activities to increase user capacity, may require time and resources that are simply not available.

Alternatively, the diversity in number and types of practices could reflect that not all practices are needed in every situation. For example the finding that development of a linkage system was not frequently endorsed, does not necessarily reflect poor dissemination practice. Long standing collaborative relationships between resource

organization and target user organizations may mitigate the need for developing a linkage system (89).

Although most organizations were heavily engaged in detailing the objectives, timelines, budget, and allocation of tasks as part of designing a dissemination plan there was low endorsement of fidelity to that dissemination plan (i.e. 78% of organizations reported minor or major modifications to the original dissemination plan or reported no plan). While lack of fidelity to an original plan can reflect poor planning - it may also represent needed adjustment to the original plans based on new information.

Rigorous evaluation and monitoring of dissemination efforts are key to providing an evidence-base for best practices in dissemination of CDP innovations (178). However, only half of PHOs, 19% NGOs and 11% grouped organizations reported heavy engagement in evaluating dissemination efforts, suggesting that training in evaluation methodology and/or increased availability of funding for evaluation may be needed. The results of rigorous process, implementation and outcome evaluations of the dissemination process provide needed groundwork for better understanding of which dissemination practices work in which specific settings and contexts, how the process actually works and how to better implement dissemination practices.

Correlates

PHOs reported average dissemination scores that were 3.1 points higher than NGOs/grouped organizations. If future research confirms that these differences reflect more successful dissemination, then the correlates of dissemination identified in this study (i.e., *Skill at planning/implementing dissemination* (capacity-skills), *external sources of funding specifically allocated for dissemination of innovations* (capacity-resources), *attitude toward process of collaboration* (openness/orientation toward dissemination), and *user centeredness* (user-centeredness of dissemination efforts) may represent useful targets for interventions to improve dissemination practices. Training programs focused on improving skills among practitioners in resource organizations in the area of planning and undertaking dissemination may be warranted. The importance of

having funding from external sources to promote comprehensive dissemination also needs to be addressed. Practices involving linkage and exchanges (179), tailoring of innovations to multiple users with sometimes competing needs (179), and enhancement of user capacity to facilitate adoption and implementation (180) can be particularly demanding of resources. External funding may provide the necessary “slack” to allow these organizations to target needed resources for innovation dissemination that their in-house operating budgets cannot permit. However, the application process for alternate sources of funding may put some organizations at a disadvantage, particularly those with fewer professional staff and administrative capacity, such as NGOs and grouped organizations (181). Incorporating sufficient and dedicated funds that recognize and support the resource-intensive nature of comprehensive dissemination is an important part of resource organizational capacity. Finally, shifts in organizational attitudes toward the process of collaboration and user-centeredness require internal mechanisms and structures be in place that: (i) promote and ingrain two-way exchanges (77,87,109,182); (ii) address territorial issues and lack of trust that can exist between the diverse set of disciplines that comprise the public health system and its stakeholders (99). Such shifts in attitude also require funding formulae supportive of collaborative approaches between resource and user entities (179), i.e. longer terms of funding can provide the needed security and stability to make these collaborations worth the effort to establish and maintain.

Limitations

Data were collected from only one key informant within each organization, albeit a key informant carefully selected as most knowledgeable about dissemination of CDP innovations. Data on organizational characteristics and processes provided by a single person may not reliably reflect the inherent complexity of organizations. Ideally, organizational-level constructs should be assessed using objective measures, but key informant-report is the most common method of data collection in organizational research. While we assessed the content validity and internal reliability of our measures, we were unable to assess inter-rater reliability: (i) due to the small number of organizations (n=17) that were able to provide two key informants knowledgeable in

dissemination of CDP; and (ii) the large proportion of these pairs of key informants (64%) that did not cite the same “reference innovation” needed for meaningful comparisons of responses. Also, criterion-related validity could not be examined because there are no “gold standard” measures of the indicators of interest. While cross-sectional data can generate hypotheses about the relationships between variables in our conceptual model, longitudinal data are needed to investigate if these associations might be causal. Finally, generalizability of our results beyond Canada may be limited.

Conclusion

Underutilization of best practices in population health promotion and chronic disease prevention represents missed opportunities to promote healthy living and prevent chronic disease. Better understanding of the process of dissemination of CDP practices and programs by public health resource organizations is critical to addressing this issue. In this project, we developed a new conceptual model of dissemination, and we proposed psychometrically sound measures of dissemination practices and empirically identified correlates of dissemination. These data provide the first national description of dissemination practices within Canadian public health organizations disseminating CDP innovations. Although we cannot comment on the effectiveness of the dissemination practices surveyed herein, there appears to be room for improvement in the level of completeness of dissemination based on the small proportion of organizations heavily engaged in more than four practices. Educational, funding, and infrastructure-related interventions may be needed to help organizations be more comprehensive in their dissemination efforts.

CHAPTER 6: METHODOLOGICAL CONSIDERATIONS

The following chapter overviews the possibility of selection, information and confounding bias that could threaten the internal validity of this research project. It also addresses the external validity of the findings. The section ends with commentary about the study design for the national survey.

6.1 THREATS TO INTERNAL VALIDITY

6.1.1 Confounding bias

Confounding is as important a potential source of bias in cross-sectional studies as in other types of observational studies (183). However the issue of confounding⁴ (i.e., a spurious association between an exposure of interest and an outcome due to the sharing of common causes (184)) was not relevant in either the work on organizational capacity or dissemination in this thesis. Because of the novelty and exploratory nature of this work, there was no variable that could be justifiably designated as an exposure of primary interest (i.e., a “main effect” of most interest), and therefore *a priori* assumptions about confounders conceptualized as extraneous variables that are associated with an exposure of interest and with the dissemination outcome, could not be made. In the study on dissemination, I described the associations between dissemination and a series of variables that

⁴ A confounder is a variable associated with the exposure in the population, associated with the outcome conditional on exposure (i.e. among the unexposed), and not in the causal pathway between the exposure and the outcome (184)

could plausibly be linked to dissemination, thereby providing candidate variables for investigations in future research. Confounding may become an issue in the future for researchers interested in testing specific hypotheses about any of these variables.

6.1.2 Information or measurement bias

Data collected in the structured telephone interviews used in the survey are subject to differential and non-differential misclassification. The concepts that were investigated in this thesis are novel and while every precaution was taken to assure content and face validity as well as to test the internal reliability of these new measures, random and/or systematic error could have been introduced in several ways including: (i) how the literature was interpreted and used to design constructs and questionnaire items (reader bias); and (ii) the choice of response categories. As with any method of measurement, data obtained in questionnaire-based interviews should have a high degree of validity and reliability to help mitigate the potential for differential and non-differential misclassification.

6.1.2.1 Reliability

According to one classification used in social, behavioural and medical research (185), the weighted kappas obtained in our inter-rater reliability sub-study of the Organizational Capacity Study, were low to substantial (0.11-0.78). Because of the challenges in conducting research wherein the unit of analysis is the organization, rather than an individual, it is unclear if these recommended boundaries of agreement are relevant to organizational research. In our work, the primary key informant in the interviewer-administered questionnaires was “the person most knowledgeable about CDP practices and implementation in the organization”. The use of a second key informant to provide data about CDP activities in the context of an inter-rater reliability study necessarily signifies that the second key informant was less knowledgeable and/or had different access to relevant information and/or knowledge. The issue of inter-rater reliability in organizational research requires further study to conceptualize and test methods that will provide valid and useful information on the accuracy of organizational measures.

6.1.2.2 Content validity

Content validity, the extent to which elements of an instrument (i.e., questionnaire items, response formats, and instructions) are relevant to and representative of the construct of interest (186) was systematically assessed. While the content validity of questionnaire items is usually the primary focus of such verifications, other elements, such as response formats and instructions to key informants, can affect the data that are obtained and also need to be validated. We used a systematic approach in this thesis to examine content validity. Specifically, we consulted experts and we tested our items with key informants in a pilot study to verify questionnaire items in both the Organizational Capacity and the Dissemination studies. This process helped identify elements that required refinement (i.e., addition or elimination of items, issues involving grammar and/or wording, sequencing of items, relevancy of response formats, clarity of instructions) and in addition it provided evidence for the content validity of our measures.

6.1.2.3 Criterion-related validity

The criterion-related validity of the measures used in this thesis (i.e., the correlation of a scale with some other measure of the concept under study considered to be a ‘gold standard’) (187) could not be investigated since there are no “gold standards” in current use. Indeed, it is difficult to conceptualize what “gold standard” measures for organizational capacity or dissemination practices might be, such that construct validity may be the only attainable goal in studies of the validity of the measures developed in this thesis.

6.1.2.4 Construct validity

No data were collected independently outside the structured telephone interviews to test hypotheses or predictions related to the key constructs measured. However support for the construct validity of our measures was provided by: (i) the “conservative confirmatory” strategy (145) of our principal component analyses. We were guided in testing the construct validity of our measures by our conceptual models, such that data were collected to tap each of the constructs in these models. The separate PCAs conducted using subsets of items thought to tap each of the main constructs in our conceptual models confirmed our conceptualization of the domains overall; (ii) the descriptive findings reported in Manuscript 2 on levels, determinants, and outcomes of organizational capacity according to geographical location (eastern, central and western Canada) and type of organization support previous anecdotal observations of systematic differences in capacity across the country, providing evidence of construct validity as well as the first empirical evidence that such differences exist.

6.1.2.5 Key informants versus respondents in organizational research

We used key informant methodology to collect data on variables measured at the level of the organization. This contrasts to the use of ‘respondents’ as study participants who represent members of an organization and provide data that reflect personal perceptions that are analyzed with individuals as the unit of analysis (i.e., in a study on job satisfaction for example). Use of key informants in organizational research has been associated with bias due to (i) the informant’s functional assignment or organizational position; and (ii) the complexity and breadth of the questions asked.

Position bias is defined as the systematic under- or over-reporting of organizational attributes due to factors that are directly related to the informant’s placement in the organizational hierarchy (188). Organizational position can influence the willingness of informants to be candid, with individuals higher in the organizational hierarchy consistently describing the work environment more positively than other members of the organization (189). Although some sources of bias are eliminated when organizational

position is controlled, other sources can be introduced when people holding similar job positions have similar characteristics such as income, educational level, and years of employment (189). To avoid potential bias due to organizational position, the criterion used to select the key informant was not based on position within the organization, but on knowledge about CDP programming. To address key informants' concerns that the employer/funder could access responses, anonymity through group analyses was assured. Position bias would likely cause an upward shift in the distribution of responses, compressing the range of responses around the upper end of the scale, thereby restricting the variance in scale scores and attenuating the observed associations to the null.

Reporting on organizational attributes requires that informants engage in a process of abstraction and generalization to arrive at summary conclusions based on their experience and knowledge of organizational practices and process (161,189). Data can be compromised in a systematic way when the reporting task exceeds informants' cognitive processing abilities. The ability of a single informant to report on organizational attributes diminished as size and complexity of the organization increases (190). Complexity can be reduced by phrasing questions using concrete references and simple terminology.

A second approach to control bias due to such errors of recall is to use multiple informants, ranging from two to five per unit of analysis (190-191). Steckler *et al* (158) suggested soliciting a collective response through group interviews or questionnaires. Although possibly more valid, this method may be costly, more difficult to control and, in addition, might require a level of organizational commitment (i.e., in terms of release time for employees to respond to questionnaires) that affects response proportions negatively. Another strategy for collecting organizational-level data is to interview several respondents within the same organization, and then average their scores. However, if raters disagree, this strategy may not be more useful than interviewing single informants, since the resulting averages may not represent coherent perspectives.

In this research project, data were collected from only one key informant within each organization. We can see no feasible alternatives to this approach at this time. In our inter-rater reliability study, finding more than one member of each organization who was competent to report on the study variables was simply not possible in many organizations. To reduce the complexity of the task required of this one key informant, we: (i) restricted the focus of inquiry to the division/unit/department that was directly implicated in CDP implementation or dissemination, if the entire organization was not engaged in CDP; (ii) used concrete references (i.e., reference innovations) wherever possible; (iii) paid particular attention to the terminology used in all our questionnaire items to avoid jargon and unnecessary complexity; and (iv) provided copies of the questionnaire in advance of the interview encouraging our informants to consult with colleagues as needed.

6.1.2.6 Use of “self-report” in organizational research

Ideally organizational-level constructs should be assessed using objective measures, but because few objective measures of organizational attributes exist, informant report or ‘self-report’ is the most common method of data collection in organizational research (161). Since all measures were collected from the same informant in this research, correlations between measures may result from artifactual covariance rather than substantive relationships (161,192). Much of the information regarding common method variance comes from psychological research in organizations, when measures are taken at the individual unit of analysis. Obtaining measures at higher levels of analysis (i.e., departmental or organizational level) is recommended as a way of dealing with this common method variance (161) suggesting that our use of single informants to collect data on organizational-level variables may have mitigated this bias.

Although misclassification of the questionnaire data cannot be ruled out, there is no reason to believe that any misclassification of the outcome (dissemination) or correlates varied in any systematic way. This nondifferential misclassification generally results in an underestimation of the underlying associations reported.

6.1.3 Selection bias

If inclusion of the entire population of interest is not feasible, selection bias can occur in cross-sectional studies as a result of the sampling scheme (i.e., decisions made in regard to which organizations are excluded by design) or because organizations which were included in the sample did not participate. In this study, a census of all organizations in the preventive health system was undertaken. Our efforts to recruit all eligible organizations into the survey resulted in a 92% response proportion, thereby capturing almost the entire population of organizations targeted in the preventive health system and reducing serious concerns about selection bias. Nonetheless, the distributions of organizational characteristics were compared (Table 6.1) to determine if the 19 organizations that were eligible but did not participate were systematically different from the participating organizations in any characteristic.

Table 6.1 Comparison of selected characteristics of participating and non-participating organizations

Organizational Characteristic	Participating organizations (n=261) N (%)	Non-participating organizations (n=19) N (%)
CDP Function		
User	180 (69)	8 (42)
Resource	49 (12)	9 (47)
Both	32 (19)	2 (11)
Provincial grouping		
West	84 (34)	1 (6)
Central	104 (42)	11 (69)
East	60 (24)	4 (25)
Type of Organization		
Formal Public Health	118 (45)	5 (26)
NGO	61 (23)	7 (37)
Alliance, Coalition, Partnership	49 (19)	5 (26)
Other	33 (13)	2 (11)
Geographical area served		
Regional	161 (62)	9 (47)
Provincial	83 (32)	7 (37)
Multi-province	5 (2)	0 (0)
Canada	12 (5)	3 (16)

* West=British Columbia, Alberta, Saskatchewan, Manitoba; Central=Ontario, Québec; and East=New Brunswick, Nova Scotia, Prince Edward Island, Newfoundland

The two groups were similar with the exception that there was a higher proportion of user and formal public health organizations among participants than among non-participants. The proportions of resource/user and of type of organization within the non-participating group of organizations were approximately equal. It is unlikely that exclusion of the small number of non-participating organizations from the analysis had substantial impact on the external validity of our results (discussed below) or on the internal validity of the estimates of prevalence of dissemination practices or organizational capacity.

6.2 EXTERNAL VALIDITY

The ability to extrapolate these findings to the Canadian preventive health system as it is defined in this study is assured because we undertook a census of all public health organizations engaged in primary chronic disease prevention at the national, provincial and regional levels and 92% of all eligible organizations participated. Our findings are limited in their generalizability to organizations engaged in primary chronic disease prevention at the local community level and in the Canadian territories. Organizations operating at a local level were not enumerated because local-level organizations do not generally have mandates to develop or disseminate programs and instead engage primarily in programming involving small groups or one-on-one type interaction. Organizations located in the three territories were not included because their programming is targeted primarily to aboriginal populations and as such, it is oriented and resourced under very different conditions than organizations targeting the general public.

To protect the confidentiality of organizations in smaller provinces, we created three broad groupings of provinces for analysis. “West” included organizations in British Columbia (BC), Alberta (AB), Saskatchewan (SK), and Manitoba (MB); “Central” included organizations in Ontario (ON) and Québec (QC); and “East” included organizations in New Brunswick (NB), Nova Scotia (NS), Prince Edward Island (PE), and Newfoundland (NF). Prevalence estimates derived for provincial groupings as presented in the Organizational Capacity Study may not extrapolate completely to provincial preventive health systems within Canada. Finally, generalizability of these results beyond Canada may be limited due to the uniqueness of our public health system.

6.3 STUDY DESIGN

The cross-sectional design of this study limits the interpretation of the associations between dissemination and its correlates reported in this thesis. Because dissemination and the correlates were measured at the same time, differentiation between cause and effect is difficult. However, the organizational-level correlates identified included type of organization, skill at planning/implementing dissemination, external sources of funding for dissemination, organizational attitudes, and user-centeredness. These factors are not expected to change, or at least not change rapidly as a result of the dissemination process. In addition, we recognize that the associations reported between indicators of organizational capacity (skills and resources) and its determinants are generally inappropriate for epidemiologic inferences (193). The value of the correlation coefficient depends on the distribution and range of the component variables and consequently on design factors. However, the correlations are generally positive and significant and supportive of our conceptualized associations. Overall, given that the state of our knowledge in this research domain is limited and that the objectives of this research were largely descriptive, the cross-sectional design used in this thesis was appropriate.

CHAPTER 7: CONCLUSION

This final chapter summarizes the main findings from this research and it reviews implications of this work in terms of future research and public health planning.

Effective dissemination of “best practices” within the public health system and adequate organizational capacity to conduct CDP are viewed by many researchers and practitioners as crucial to reducing the chronic disease burden in Canada. However, little is known about how dissemination of innovations occurs within our public health system and there are no descriptions of dissemination or organizational capacity in the diverse types of organizations that comprise the preventive health system (i.e., the part of the public health system mandated to undertake primary prevention of chronic disease). Although dissemination and organizational capacity have not been studied frequently using traditional epidemiologic approaches and methods, epidemiology has played an important role in curative health services research and in public health planning. An epidemiologic perspective (i.e., an approach to scientific investigation rooted in epidemiologic concepts and methods) can make an important contribution in this emerging area of preventive health services research.

A thorough review of the literature in the areas of dissemination of innovations and organizational capacity indicates that, at least from an epidemiologic perspective, there are important gaps that need to be addressed. Most of the work done in these areas uses qualitative approaches and there are limitations in developing knowledge based only on qualitative work. While informative, qualitative research does not lend itself to generalization across organizations or jurisdictions. We lack conceptual diagrams of proposed causal linkages among the set of concepts believed to be related to organizational capacity and dissemination in our public health system. Similar to the causal graphs or directed acyclic graphs describing plausible causal bases that are becoming popular for describing biological phenomena (184), conceptual diagrams or models aid in organizing hypotheses and systematic thinking in planning public health

research and in guiding empirical testing of hypotheses and conceptual models (194). Also lacking are valid and reliable quantitative measures needed for standardized investigations. Finally, baseline descriptions of the current “state of affairs” at a national level are non-existent. This thesis addresses these important gaps and builds the backbone so that future researchers can have tools to move research on dissemination and organizational capacity forward.

7.1 SUMMARY OF THE WORK AND FINDINGS

Development of a conceptual model was fundamental to organizing and synthesizing the disparate literatures in the areas of organizational capacity and dissemination of innovations and in planning this research. We presented one overarching model, and two study-specific models to help position the two primary studies that comprise this thesis in the innovation development-dissemination-utilization continuum. The **Conceptual Model for the Development, Dissemination and Utilization of Innovations in the Preventive Health System** is a general framework that depicts the entire innovation development-dissemination-utilization continuum and the three systems that are involved as an innovation progresses from development to dissemination to utilization (i.e., adoption and implementation). These three systems include the resource system, the user system and a linkage system between the resource and user systems. In this model, the resource system is the agency or organization that develops and disseminates CDP innovations. The user system includes organizations that will adopt and implement the innovation in a specific target population. The linkage system comprises representation from both the resource and user systems. The **Conceptual Model of Organizational Capacity for CDP** focuses on the utilization segment of the innovation development-dissemination-utilization continuum. It was developed from the user perspective. It does not depict the utilization process per se but describes hypothesized causal linkages between organizational capacity (conceptualized as skills and resources) for CDP program implementation, its determinants and its outcomes. The **Conceptual Model of Dissemination of CDP Innovations from Resource to User Organization(s)** focuses on the dissemination segment of the innovation development-dissemination-utilization continuum. In this model, the resource organization and the user organization(s) are

situated in a context of linkage and two-way exchange. It depicts the nine practices comprising the process of dissemination within the resource organization and it posits several types of resource-specific factors as potential correlates of dissemination.

In the context of a national survey, instruments to measure organizational capacity, its determinants, and outcomes, and dissemination and its potential correlates were developed and tested psychometrically. To our knowledge, this thesis provides the first baseline data describing organizational capacity and dissemination in the Canadian public health system. A summary of the key findings from this program of research is provided in Table 7.1.

Table 7.1 Summary of key findings regarding organizational capacity and dissemination

Research Topic	Finding
<ul style="list-style-type: none"> Infrastructure for CDP 	The infrastructure for CDP (i.e. the preventive health system) comprises many different types of organizations, less than half of which are formal public health entities.
<ul style="list-style-type: none"> Organizational Capacity for CDP 	
Skills	Skill levels were highest for programming related to tobacco control and healthy eating; and lowest for stress management, social determinants of health, and program evaluation.
Resources	Adequacy of resources for CDP programming was perceived as low across the country, but particularly in formal public health organizations and in the Atlantic provinces.
<ul style="list-style-type: none"> Involvement in CDP programming 	Involvement in CDP programming was highest for programming related to tobacco control and healthy eating; and lowest for stress management, social determinants of health, and program evaluation.
<ul style="list-style-type: none"> Determinants of organizational capacity for CDP 	Organizational support for evaluation of CDP programming was rated the weakest of the indicators of determinants of organizational capacity, suggesting the need for training in evaluation methodology, increased resourcing for evaluation activities, as well as improved funding that recognizes the importance of evaluation.
<ul style="list-style-type: none"> Dissemination practices 	The number of practices in which organizations were heavily engaged differed widely across organizations, and there did not seem to be any systematic patterns in terms of the co-occurrence of specific practices.
<ul style="list-style-type: none"> Correlates of dissemination 	Forty-two percent of the variation in dissemination can be attributed to type of organization, organizational capacity (skill at planning/implementing dissemination and external sources of funding specifically allocated for dissemination), openness/orientation toward dissemination, and user-centeredness of dissemination efforts) which may represent useful targets for interventions to improve dissemination practices.

7.2 IMPLICATIONS FOR RESEARCH

Findings from this thesis have numerous implications for future research. The measures developed herein offer researchers measurement tools and reliable measures that did not exist before our work. These instruments have the potential for wide applicability to programming in other chronic disease areas such as HIV and in the dissemination of many different health-related innovations. Although modifications may be necessary for other types of programming, many of the items could be considered generic. Since content validity can vary across populations, validity would need to be established for that population and for the intended function (186). Availability of standardized instruments may promote greater uniformity as well as more useful comparison between different types of chronic disease programming outside CVD, DM, chronic respiratory illnesses and cancer.

A follow-up survey to the organizational study described in this thesis is planned and has received Canadian Institutes of Health Research funding. Longitudinal data are needed to investigate if the associations observed in this thesis between organizational capacity and its proposed determinants and outcomes might be causal. The pace of change in the public health system has accelerated substantially since we conducted the first survey in 2004-5. In particular, the creation of the Public Health Agency of Canada in 2005 spurred major changes in the provincial and national public health landscape. At the same time, many universities across the country introduced graduate-level programs in public health that target public health practitioners across the country. Several provinces have introduced wide-reaching chronic disease prevention programs. Finally, the recent creation of the National Collaborating Centres of the Public Health Agency of Canada across the country will contribute to the development of innovative approaches to public health practice. It is unknown however, if these changes have produced improvement in organizational capacity for CDP across the country.

To build on the findings from this research, similar studies need to be conducted in other public health systems. Corroborating evidence from studies conducted in other chronic

disease areas within Canada would also enhance the generalizability of these findings. Future research should test if an association exists between organizational capacity for CDP and the impact of CDP programming on population health. Similarly there is need to investigate the differential impact of dissemination on program uptake and utilization when resource organizations engage in different subsets of dissemination practices. Finally, the independent correlates of each of the 13 individual practices that comprise the dissemination process should be identified. Our results showed no consistent pattern in the dissemination practices endorsed by organizations and decomposing the process to examine factors associated with each practice may shed some light on this finding.

Although not presented in this thesis, we collected detailed data on experiences within user organizations in terms of adopting CDP innovations developed outside their organizations. Positive correlations between these data and measures such as user-centeredness and attitudes toward the process of collaboration developed in the Dissemination Study will contribute to the assertion of validity of these measures.

7.3 IMPLICATIONS FOR PUBLIC HEALTH

This research provides important insights into the range and diversity of organizations that comprise the infrastructure of the preventive health system in Canada. While it may be premature to use the results from one research study for public health planning, data such as these are needed to guide strategic investment to build capacity within the preventive health system (i.e., through professional training, resource allocation, etc.). Instruments such as the ones developed in this investigation can be used to develop a surveillance system to monitor organizational capacity and dissemination, which will in turn support the achievement of national public health goals. Collectively the results of this thesis provide the “backbone” for future research to achieve these public health goals sooner rather than later.

REFERENCES

1. O'Loughlin J, Elliott SJ, Cameron R, Eyles J, Harvey D, Robinson K, Hanusaik N. From diversity comes understanding: health promotion capacity-building and dissemination research in Canada. *Promot Educ* 2001(Suppl 1):4-8.
2. Stachenko S. The Canadian Heart Health Initiative: dissemination perspectives. *Can J Public Health* 1996;Suppl 2:S57-S59.
3. World Health Organization. The World Health Report 2002 – Reducing Risks, Promoting Healthy Life. Geneva: World Health Organization; 2002.
4. Mirolla, M. 2004. The cost of chronic disease in Canada. Report prepared for the Chronic Disease Prevention Alliance of Canada. Available from: <http://www.gpiatlantic.org/publications/pubs.htm/>
5. World Health Organization. 2001. Assessment of national capacity for noncommunicable disease prevention and control: The report of a global survey. Geneva: WHO.
6. World Health Organization. Preventing chronic diseases: a vital investment. Geneva: World Health Organization; 2005.
7. Cameron R, Jolin MA, Walker R, McDermott N, Gough M. Linking science and practice: Toward a system for enabling communities to adopt best practices for chronic disease prevention. *Health Promot Pract* 2001; 2(1): 35-42.
8. Statistics Canada. Population projections for Canada, provinces and territories. Cat. No. 01-520-XIE. 2005. Ottawa: Minister of Public Works and Government Services.

9. Shah CP. Public health and preventive medicine in Canada. 5th edition. Toronto: Elsevier Canada, 2003.
10. Tulchinsky TH, Varavikova EA. The new public health: An introduction for the 21st century. San Diego, CA: Academic Press, 2000.
11. Brownson RC, Remington PL, Davis JL (ed.). Chronic Disease Epidemiology and Control 2nd edition. Washington, DC: American Public Health Association; 1998.
12. Harvey D, Hook E, Kozyniak J, Selvanathan M. Building the case for the prevention of chronic disease. Ottawa: Health Canada; 2002.
13. Cameron C, Wolfe R, Craig C. Physical activity and sport: Encouraging children to be active. Ottawa: Canadian Fitness and Lifestyle Research Institute; 2007.
14. Wolf-Maier K, Cooper RS, Banegas JR, Giampaoli S, Hense H-W, Joffres M, Katarinen M, Poulter N, Primatesta P, Rodriguez-Artalejo F, Stegmayr B, Thamm M, Tuomilehto J, Vanuzzo D, Vescio F. Hypertension prevalence and blood pressure levels in 6 European countries, Canada, and the United States. JAMA. 2003;289(18):2363-2369.
15. MacDonald S, Joffres MR, Stachenko S, Horlick L, Fodor G, for the Canadian Heart Health Surveys Research Group. Multiple cardiovascular disease risk factors in Canadian adults. CMAJ 1992;146:2021-2029.
16. Health Canada. Canadian Tobacco Use Monitoring Survey (CTUMS). Ottawa: Health Canada; 2006. Available from: http://www.hc-sc.gc.ca/hl-vs/tabac/research-recherche/stat/_ctums-esutc_2006/ann_summary-sommaire_e.html.

17. Gray-Donald K, Jacobs-Starkey L, Johnson-Down L. Food habits of Canadians: Reduction in fat intake over a generation. *Can J Public Health* 2000;91(5):381-85.
18. Statistics Canada. The Community Health Surveys – A First Look. The Daily. Wednesday, May 8, 2002. Available from:
<http://www.statcan.ca/Daily/English/020508/d020508a.html>
19. Katzmarzyk PT, Gledhill N, Shephard RJ. The economic burden of physical inactivity in Canada. *CMAJ* 2000;163 (11):1435-40.
20. Birmingham CL, Muller JL, Palepu A, Spinelli JJ, Anis AH. The cost of obesity in Canada. *CMAJ* 1999;160(4):483-88.
21. Collishaw NE, Leahy K. Mortality attributable to tobacco use in Canada. *Can J Public Health* 1988;79:166-9.
22. Ellison LF, Mao Y, Gibbons L. Projected smoking-attributable mortality in Canada, 1991-2000. *Chronic Diseases in Canada* 1995;16:84-89.
23. World Cancer Research Fund and the American Institute for Cancer Research (WCRF/AICR). Food, nutrition, physical activity and the prevention of cancer: A global perspective. Washington, DC: AICR; 2007.
24. Health Canada. Towards a common understanding: Clarifying the core concepts of population health. Ottawa: Health Canada, 1996. <http://www.phac-aspc.gc.ca/ph-sp/phdd/approach/linked.html>
25. Rose G. Sick individuals and sick populations. *Int J Epidemiol* 1985;14:32-38.
26. Rose G, Day S. The population mean predicts the number of deviant individuals. *BMJ* 1990;301:1031-1034.

27. Frenk J. The new public health. *Annu Rev Public Health* 1993;14:469-490.
28. Federal, Provincial and Territorial Advisory Committee on Population Health (ACPH). Survey of public health capacity in Canada: highlights. Ottawa: The Advisory Committee; 2002.
29. Frank J, Di Ruggiero E, Moloughney B. The future of public health in Canada: developing a public health system for the 21st century. Ottawa: Canadian Institutes of Health Research; 2003.
30. Frank J, Di Ruggiero E. Public health in Canada: what are the real issues? *Can J Public Health* 2003; 94:190-192.
31. World Health Organization, Health and Welfare Canada, and the Canadian Public Health Association. Ottawa Charter for Health Promotion. WHO/HPR/HEP/95.1. Geneva: WHO; 1986.
32. Best A, Moor G, Holmes B, Clark PI, Bruce T, Leischow S, Buchholz K, Krajnak J. Health promotion dissemination and systems thinking: Towards an integrative model. *Am J Health Behav* 2003;27(Suppl 3):S206-S216.
33. Midgley G. Systemic intervention for public health. *Am J Public Health* 2006; 96(3):466-471.
34. Raphael D, Steinmetz B. Assessing the knowledge and skills of community-based health promoters. *Health Promot Int* 1995;10:305-315.
35. Jackson C, Fortmann SP, Flora JA, Melton RJ, Snider JP, Littlefield D. The capacity-building approach to intervention maintenance implemented by the Stanford Five-City Project. *Health Educ Res* 1994;9:385-396.

36. Goodman R, Speers M, McLeroy K, Fawcett S, Kegler M, Parker E, Rathgeb Smith S, Sterling TD, Wallerstein N. Identifying and defining the dimensions of community capacity to provide a basis for measurement. *Health Educ Behav* 1998;25:258-278.
37. Hawe P, Noort M, King L, Jordens C. Multiplying health gains: the critical role of capacity building within health promotion programs. *Health Policy* 1997;39:29-42.
38. Goodman RM, Steckler A, Alciati MH. A process evaluation of the National Cancer Institute's Data-based Intervention Research program: a study of organizational capacity building. *Health Educ Res* 1997;12:181-197.
39. Crisp B, Swerissen H, Duckett S. Four approaches to capacity building in health: consequences for measurement and accountability. *Health Promot Int* 2000;15:99-107.
40. Labonte R, Laverack G. Capacity building for health promotion: Part 1. For whom? And for what purpose? *Crit Public Health* 2001;11:111-127.
41. Labonte R, Laverack G. Capacity building for health promotion: Part 2. Whose use? And with what measurement? *Crit Public Health* 2001;11:129-138.
42. Germann K, Wilson D. Organizational capacity for community development in regional health authorities: a conceptual model. *Health Promot Int* 2004;19:289-298.
43. Hawe P, King L, Noort M, Jordens C, Lloyd B. Indicators to help with capacity-building in health promotion. North Sydney: NSW Health Department; 1999.

44. Taylor, SM, Elliott S, Riley B. Heart health promotion: predisposition, capacity and implementation in Ontario public health units, 1994-96. *Can J Public Health* 1998;89:410-414.
45. Heath S, Farquharson J, MacLean D, Barkhouse K, Latter C, Joffres C. Capacity-building for health promotion and chronic disease prevention – Nova Scotia's experience. *Promot Educ* 2001;Suppl 1:17-22.
46. McLean S, Ebbesen L, Green K, Reeder B, Butler-Jones D, Steer S. Capacity for community development: an approach to conceptualization and measurement. *Journal of the Community Development Society* 2001; 32:251-270.
47. Smith C, Raine K, Anderson D, Dyck R, Plotnikoff R, Ness K, McLaughlin KK. A preliminary examination of organizational capacity for heart health promotion in Alberta's regional health authorities. *Promot Educ* 2001; Suppl 1:40-43.
48. Pearson TA, Bales VS, Blair L, Emmanuel SC, Farquhar JW, Low LP, MacGregor LJ, MacLean DR, O'Conner B, Pardell H, Petrasovits A. The Singapore Declaration: forging the will for heart health in the next millennium. *CVD Prevention* 1998;1(3):182-199.
49. Naylor P, Wharf-Higgins J, O'Connor B, Odegard L, Blair L. Enhancing capacity for cardiovascular disease prevention: An overview of the British Columbia Heart Health Dissemination Project. *Promot Educ* 2001;Suppl 1:44-48.
50. Elliott S, Taylor S, Cameron R, Schabas R. Assessing public health capacity to support community-based heart health promotion: The Canadian Heart Health Initiative, Ontario Project (CHHIOP). *Health Educ Res* 1998;13:607-622.

51. Riley B, Taylor M, Elliott S. Determinants of implementing heart health promotion activities in Ontario public health units: a social ecological perspective. *Health Educ Res* 2001;16:425-441.
52. Ebbesen L, Health S, Naylor P, Anderson D. Issues in measuring health promotion capacity in Canada: a multi-province perspective. *Health Promot Int* 2004;19:85-94.
53. Anderson D, Plotnikoff R, Raine K, Cook K, Smith C, Barrett L. Towards the development of scales to measure “will” to promote health heart within health organizations in Canada. *Health Promot Int* 2004;19:471-481.
54. Barrett L, Plotnikoff R, Raine K, Anderson D. Development of measures of organizational leadership for health promotion. *Health Educ Behav* 2005;32:195-207.
55. Champagne F, Leduc N, Denis J-L, Pineault R. Organizational and environmental determinants of the performance of public health units. *Soc Sci Med* 1993;37:85-95.
56. Richard L, Kishchuk N, Potvin L, Denis J-L. Organizational and professional characteristics predicting external communications in Canadian public health units. *Can J Public Health* 2001;92:387-442.
57. Miller CA, Moore KS, Richards TB, Kotelchuck M, Kaluzny AD. Longitudinal observations on a selected group of local health departments: A preliminary report. *J Public Health Policy* 1993;14:34-50.
58. Studnicki, J. Evaluating the performance of public health agencies: information needs. *Am J Prev Med* 1995;11:74-80.

59. Suen J, Christenson G, Cooper A, Taylor M. Analysis of the current status of public health practices in local health departments. *Am J Prev Med* 1995;11:51-54.
60. Ford EW, Duncan WJ, Ginter PM. Health departments' implementation of public health's core functions: an assessment of health impacts. *Public Health* 2005;119:11-21.
61. Parker E, Margolis LH, Eng E, Henríquez-Roldán C. Assessing the capacity of health departments to engage in community-based participatory public health. *Am J Public Health* 2003;93:472-476.
62. Feinberg ME, Greenberg MT, Osgood DW. Readiness, functioning, and perceived effectiveness in community prevention coalitions: a study of communities that care. *Am J Community Psychol* 2004;33:163-176.
63. Lachance LL, Houle CR, Cassidy EF, Bourcier E, Cohn JH, Orians CE, Coughney K, Geng X, Joseph CL, Lyde MD, Doctor LJ, Clark NM. Collaborative design and implementation of a multisite community coalition evaluation" *Health Promot Pract* 2006;7(Suppl 2):44S-55S.
64. Kramer JS, Philliber S, Brindis CD, Kamin SL, Chadwick AE, Revels ML, Chervin DD, Driscoll A, Bartelli D, Wike RS, Peterson SA, Schmidt CK, Valderrama LT. Coalition models: lessons learned from the CDC's Community Coalition Partnership Programs for the Prevention of Teen Pregnancy. *J Adolesc Health* 2005;37(Suppl 1):S20-S30.
65. McMillan B, Florin P, Stevenson J, Kerman B, Mitchell RE. Empowerment praxis in community coalitions. *Am J Community Psychology* 1995;23:699-727.

66. Gottlieb NH, Brink SG, Gingiss PL. Correlates of coalition effectiveness: the Smoke Free Class of 2000 Program. *Health Educ Res* 1993;8(3):375-384.
67. Kegler MC, Williams CW, Cassell CM, Santelli J, Kegler SR, Montgomery SB, Bell ML, Martinez YG, Klein JD, Mulhall P, Will JA, Wyatt VH, Felice TL, Hunt SC. Mobilizing communities for teen pregnancy prevention: associations between coalition characteristics and perceived accomplishments. *J Adolesc Health* 2005;37(Suppl 1):S31-S41.
68. Gomez BJ, Greenberg MT, Feinberg ME. Sustainability of community coalitions: an evaluation of Communities That Care. *Prev Sci* 2005;6:199-202.
69. Joffres C, Heath S, Farquharson J, Barkhouse K, Latter C, MacLean DR. Facilitators and challenges to organizational capacity building in heart health promotion. *Qual Health Res* 2004;14:39-60.
70. Harvey D, Hook E, McKay M, Capanec D, Gelsky D. Enhancement of rural community committee capacity for health promotion in Manitoba. *Promot Educ* 2001; Suppl 1:31-34.
71. Holmes P, Donovan C, MacDonald CA. The Newfoundland and Labrador Heart Health Program Dissemination Story: The formation and functioning of effective coalitions. *Promot Educ* 2001;Suppl 1: 8-12.
72. White R, Mitchell T, Gyorli-Dyke E, Sweet L, Hebert R, Moase O, MacPhee R, MacDonald B. Prince Edward Island Heart Health Dissemination Research Project: establishing a sustainable community mobilization initiative. *Promot Educ* 2001;Suppl 1:13-17.

73. Mitchell RE, Florin P, Stevenson JF. Supporting community-based prevention and health promotion initiatives: developing effective technical assistance systems. *Health Educ Behav* 2002;29:620-639.
74. Richter DL, Potts LH, Prince MS, Dauner KN, Reininger BL, Thompson-Robinson M, Corwin SJ, Getty C, Jones R. Development of a curriculum to enhance community-based organizations' capacity for effective HIV prevention programming and management. *AIDS Educ Prev* 2006;18:362-374.
75. Miller RL, Bedney BJ, Guenther-Grey C. Assessing organizational capacity to deliver HIV prevention services collaboratively: tales from the field. *Health Educ Behav* 2003;30:582-600.
76. Ramos RL, Ferreira-Pinto J. A model for capacity-building in AIDS prevention programs. *AIDS Educ Prev* 2002; 14:196-206.
77. King L, Hawe P, Wise M. Making dissemination a two-way process. *Health Promot Int* 1998;13(3):237-44.
78. Caburnay CA, Kreuter MW, Donlin MJ. Disseminating effective health promotion programs from prevention research to community organizations. *J Public Health Manag Pract* 2001;7(2):81-89.
79. Kerner J, Rimer B, Emmons K. Introduction to the special section on dissemination: Dissemination research and research dissemination: How can we close the gap? *Health Psychol* 2005;24(5):443-6.
80. Steckler A, Goodman RM, McLeroy KR, Davis S, Koch G. Measuring the diffusion of innovative health promotion programs. *Am J Health Promot* 1992;6(3):214-25.

81. Basch CE. Research on disseminating and implementing health education programs in schools. *Health Educ* 1984; 15(4):57-66.
82. Lomas J. Diffusion, dissemination, and implementation: Who should do what? *Ann N Y Acad Sci*. 1993;703:226-35.
83. Ellis P, Robinson P, Ciliska D, Armour T, Brouwers M, O'Brien MA, Sussman J, Raina P. A systematic review of studies evaluating diffusion and dissemination of selected cancer control interventions. *Health Psychol* 2005;24(5):488-500.
84. Bero LA, Grilli R, Grimshaw JM, Harvey E, Oxman AD, Thomson MA on behalf of the Cochrane Effective Practice and Organization of Care Review Group. Closing the gap between research and practice: an overview of systematic reviews of interventions to promote the implementation of research findings. *BMJ* 1998;317(7156):465-68.
85. Johnson JL, Green LW, Frankish CJ, MacLean DR, Stachenko S. A dissemination research agenda to strengthen health promotion and disease prevention. *Can J Public Health* 1996;87(Suppl 2):S5-S10.
86. Oldenburg BF, Sallis JF, French ML, Owen N. Health promotion research and the diffusion and institutionalization of interventions. *Health Educ Res* 1999; 14(1):121-130.
87. Cameron R, Brown KS, Best JA. The dissemination of chronic disease prevention programs: Linking science and practice. *Can J Public Health* 1996;87(Suppl 2):S50-S53.
88. Riley B. Dissemination of heart health promotion in the Ontario public health system: 1989-1999. *Health Educ Res* 2003;18(1):15-31.

89. Havelock RG. Planning for innovation through dissemination and utilization of knowledge. Ann Arbor, MI: Institute for Social Research, the University of Michigan; 1971.
90. Rogers EM. Diffusion of innovations. 5th edition. New York: Free Press; 2003.
91. Rogers EM. Diffusion of innovations. 4th edition. New York: Free Press; 1995.
92. Caplan N. The two communities theory and knowledge utilization. Am Behav Sci 1979;22:459-470.
93. Oh CH, Rich RF. Explaining use of information in public policymaking. Knowledge and Policy 1996;9(1):3-35.
94. Kolbe L, Iverson D. Implementing comprehensive health education: Educational innovations and social change. Health Educ Q 1981;8(1):57-80.
95. Orlandi M. Promoting health and preventing disease in health care settings: an analysis of barriers. Prev Med 1987;16(1):119-30.
96. Orlandi MA, Landers C, Weston R, Haley N. Diffusion of health promotion innovations. In K Glanz, FM Lewis and B Rimer (eds). Health Behaviour and Health Education: Theory Research and Practice, pp 288-315. San Francisco: Jossey-Bass Publishers; 1990.
97. Orlandi MA. Health promotion technology transfer: Organizational perspectives. Can J Public Health 1996;87(Suppl 2):S28-S33.
98. O'Loughlin J, Renaud L, Richard L, Gomez LS, Paradis G. Correlates of the sustainability of community-based heart health promotion interventions. Ann Epidemiol 1998;8(7):422-432.

99. Crosswaite C, Curtice L. Disseminating research results – the challenge of bridging the gap between health research and health action. *Health Promot Int* 1994;9(4): 289-96.
100. Bartholomew LK, Parcel GS, Kok G, Gottlieb NH. Intervention mapping: Designing theory and evidence-based health promotion programs. Mountain View, CA: Mayfield Publishing Company; 2001.
101. Lippitt R, Watson J, Westley B. The dynamics of planned change. New York: Harcourt, Brace, and World. 1958.
102. Rich R, Zaltman G. Toward a theory of planned social change: alternative perspectives and ideas. *Evaluation* 1978;(Special Issue): 41-47.
103. Rogers EM. Diffusion of innovations. New York: Free Press; 1962.
104. Goldman DK. Perceptions of innovations as predictors of implementation levels: The diffusion of a nation-wide health education campaign. *Health Educ Q* 1994;21(4):432-44.
105. Goodman RM, Steckler A. A model for the institutionalization of health promotion programs. *Fam Community Health* 1989;11(4):63-78.
106. Van Assema P, Brug J, Glanz K, Dolders M, Mudde A. Nationwide implementation of guided supermarket tours in Netherlands: A dissemination study. *Health Educ Res* 1998;13(4):557-566.
107. Rogers EM. Diffusion of innovations. 3rd edition. New York: The Free Press; 1983

108. Mutschler E, Hoefer R. Factors affecting the use of computer technology in human service organizations. *Adm Soc Work* 1990;14(1):87-101.
109. Huberman M. Steps toward an integrated model of research utilization. *Knowledge: Creation, Diffusion, Utilization* 1987;8(4):586-611.
110. Rabin BA, Brownson RC, Kerner JF, Glasgow RE. Methodologic challenges in disseminating evidence-based interventions to promote physical activity. *Am J Prev Med* 2006;31(4S):S24-S34.
111. Scheirer MA, Shediac M, Cassady CE. Measuring the implementation of health promotion programs: The case of the Breast and Cervical Cancer Program in Maryland. *Health Educ Res* 1995;10(1):11-25.
112. Miller RL & Shinn M. Learning from communities: Overcoming difficulties in dissemination of prevention and promotion efforts. *Am J Community Psychol* 2005;35(3/4):169-183.
113. Brink SG, Basen-Engquist KM, O'Hara-Tomkins NM, Parcel GS, Gottlieb NH, Lovato CY. Diffusion of an effective tobacco prevention program. *Health Educ Res* 1995;10(3): 283-295.
114. Renaud L, Chevalier S, O'Loughlin J. L'institutionnalisation des programmes communautaires: Revue des modèles théoriques et proposition d'un modèle. *Can J Public Health* 1997;88(2):109-113.
115. DiFranceisco W, Kelly JA, Otto-Salaj L, McAuliffe TL, Somlai AM, Hackl K, Heckman TG, Holtgrave DR, Rompa DJ. Factors influencing attitudes within AIDS service organizations toward the use of research-based HIV prevention interventions. *AIDS Educ Prev* 1999;11(1):72-86.

116. Landry R, Amara N, Lamari M. Utilization of social science research knowledge in Canada. *Research Policy* 2001;30:333-349.
117. Ciliska D, Robinson P, Horsley T, Ellis P, Brouwers M, Gauld M, Baldassarre F, Raina P. Diffusion and dissemination of evidence-based dietary strategies for the prevention of cancer. *Curr Oncol* 2006;13(4):130-140
118. Greenhalgh T, Robert G, MacFarlane F, Bate P, Kyriakidou O. Diffusion of innovations in service organizations: Systematic review and recommendations. *Milbank Q* 2004;82(4):581-629.
119. Gomel M, Saunders JB, Burns L, Hardcastle D, Sumich M. Dissemination of early interventions for harmful alcohol consumption in general practice. *Health Promot J Austr* 1994;4(2):65-69.
120. Richmond RL, Anderson P. Research in general practice for smokers and excessive drinkers in Australia and the UK. III. Dissemination of interventions. *Addiction* 1994;89:49-62.
121. Backer TE, Liberman RP, Kuehnel TG. Dissemination and adoption of innovative psychosocial interventions. *J Consult Clin Psychol* 1986;34(1):111-18.
122. Patton M. *Qualitative evaluation and research methods*. Newbury Park, CA: Sage Publications; 1990.
123. Newell A, Simon H. *Human problem solving*. Englewood Cliffs, New Jersey: Prentice Hall; 1972.
124. Vallerand RJ. Toward a methodology for the transcultural validation of psychological questionnaires: Implications for research in the French language. *Can Psychol* 1989;30:662-680.

125. Guillemin F, Bombardier C, Beaton D. Cross-cultural adaptation of health-related quality of life measures: Literature review and proposed guidelines. *J Clin Epidemiol* 1993;46:1417-32.
126. Canadian Heart Health Initiative – Ontario Project (CHHIOP). Survey of Capacities, Activities, and Needs for Promoting Heart Health (SCAN) of Community Agencies, 1996. [unpublished survey instrument].
127. Canadian Heart Health Initiative – Ontario Project (CHHIOP). Survey of Capacities, Activities, and Needs for Promoting Heart Health; 1997. [unpublished survey instrument].
128. Heart Health Nova Scotia. Measuring Organizational Capacity for Heart Health Promotion: SCAN of Community Agencies; 1996. [unpublished survey instrument].
129. Heart Health Nova Scotia. Capacity for Heart Health Promotion Questionnaire – Organizational Practices; 1998. [unpublished survey instrument].
130. Saskatchewan Heart Health Program. Health Promotion Contact Profile; 1998. [unpublished survey instrument].
131. Alberta Heart Health Project. Health promotion capacity survey; 2000. [unpublished survey instrument].
132. Alberta Heart Health Project. Health Promotion Organizational Capacity Survey: Self-assessment; 2001. [unpublished survey instrument].
133. British Columbia Heart Health Project (BCHHP). Revised Activity Scan; 2001. [unpublished survey instrument].

134. Ontario Heart Health Project. Survey of Public Health Units; 2003. [unpublished survey instrument].
135. Lusthaus C, Adrien M-H, Anderson G, Carden F. Enhancing organizational performance: A toolbox for self-assessment. Ottawa: International Development Research Centre; 1999.
136. Nathan S, Rotem S, Ritchie J. Closing the gap: building the capacity of non-government organizations as advocates for health equity. *Health Promot Int* 2002;17:69-78.
137. Tabachnick BG, Fidell LS. Using multivariate statistics. Boston: Allyn and Bacon; 2001.
138. Hatcher L, Stepanski EJ. A step-by-step approach to using the SAS system for univariate and multivariate statistics. Cary, NC: SAS Institute Inc; 1994.
139. Streiner DL. Figuring out factors: the use and misuse of factor analysis. *Can J Psychiatry* 1994;39:135-140.
140. Cattell RB. The Scree Test for the number of factors. *Multivariate Behav Res* 1966;1:245-76.
141. Norman GR, Streiner DL. Biostatistics: The bare essentials. 2nd edition. Hamilton, Ontario: B.C. Decker Inc.; 2000.
142. Kuder GF, Richardson MW. The theory of estimation of test reliability. *Psychometrika*. 1937; 2:151-160.

143. Cronbach LJ. Coefficient alpha and the internal structure of tests. *Psychometrika* 1951;16:297-334.
144. Clark LA, Watson D. Constructing validity: basic issues in objective scale development. *Psychol Assess* 1995;7:309-319.
145. Velicer WF, Jackson DN. Component analysis versus common factor analysis: some issues in selecting an appropriate procedure. *Multivariate Behav Res* 1990;25:1-28.
146. Cohen JA. A coefficient of agreement for nominal scales. *Educ Psychol Meas* 1960;20:37-46.
147. Cohen J. Weighted kappa: Nominal scale agreement with provision for scaled agreement or partial credit. *Psychol Bull* 1968;70:213-220.
148. Fleiss JL, Cohen J. The equivalence of weighted kappa and the intraclass correlation coefficient as measures of reliability. *Educ Psychol Meas* 1973;33:613-619.
149. Cicchetti DV. A new measure of agreement between rank ordered variables. *Proceedings from the American Psychological Association*. 1972;7:17-18.
150. Lavis JN, Robertson D, Woodside JM, McLeod CB, Abelson J. How can research organizations more effectively transfer research knowledge to decision makers? *Milbank Q* 2003;81(2): 221-248.
151. Muthard J & Felice K. Assessing activities for utilization of rehabilitation research. *Knowledge*. 1982;4(2):309-328

152. Kleinbaum DG, Kupper LL, Muller KE, Nizam A. Applied regression analysis and other multivariable methods. 3rd ed. Pacific Grove, CA: Brooks/Cole Publishing Co.; 1998.
153. Donner A, Klar N. Design and analysis of cluster randomization trials in health research. New York: Oxford University Press Inc.; 2000.
154. Statistics Canada. Statistical Report on the Health of Canadians. Cat. No. 82-570-XIE. 1999. Ottawa, Minister of Public Works and Government Services. (Health Canada Cat. No. H39-467/1999E).
155. Health Canada. Economic burden of illness in Canada, 1998. Catalogue No H21-136/1998E. Ottawa: Ministry of Public Works and Government Services; 2002.
156. Winkleby MA, Feldman HA, Murray DM. Joint analysis of three US community intervention trials for reduction of cardiovascular disease risk. *J Clin Epidemiol* 1997;50:645-658.
157. Alberta Heart Health Project. Health promotion individual capacity survey: self-assessment. Edmonton: University of Alberta; 2001 [unpublished survey instrument].
158. Steckler A, Goodman RM, Alciati MH. Collecting and analyzing organizational level data for health behaviour research (editorial). *Health Educ Res* 1997;12:i-iii.
159. Reich MR. Public-private partnerships for public health. *Nat Med* 2000;6:617-620.
160. Gordon WA, Brown M. Building research capacity: the role of partnerships. *Am J Phys Med Rehabil* 2005;84:999-1004.

161. Podsakoff PM, Organ DW. Self-reports in organizational research: Problems and prospects. *J Manag* 1986;12(4):531-544.
162. Hanusaik N, O'Loughlin JL, Kishchuk N, Eyles J, Robinson K, Cameron R. Building the backbone for organisational research in public health systems: development of measures of organisational capacity for chronic disease prevention. *J Epidemiol Community Health*. 2007;61:742-749.
163. Haydon E, Roerecke M, Giesbrecht N, Rehm J, Kobus-Matthews M. Chronic disease in Ontario and Canada: determinants, risk factors and prevention priorities. Report prepared for the Ontario Chronic Disease Prevention Alliance & the Ontario Public Health Association; 2006.
164. Hall MH, Phillips SD, Meillat C, Pickering D. Assessing performance: evaluation practices & perspectives in Canada's voluntary sector. Toronto: Canadian Centre for Philanthropy; 2003.
165. Puska P, Tuomilehto J, Nissinen A, Vartiainen E. The North Karelia Project. 20 year results and experiences. Helsinki, National Public Health Institute, KTL, 1995.
166. Farquhar JW, Fortmann SP, Flora JA, Taylor CB, Haskell WL, Williams PT, et al. Effects of community-wide education on cardiovascular disease risk factors. The Stanford Five-City Project. *JAMA*. 1990;264(3):359-65.
167. Farquhar JW, Maccoby N, Wood PD. Stanford Three-Community Study: a community-based cardiovascular risk education campaign. In: Proceedings of the University of Michigan Health Services Research Center Conference on Factors Promoting or Inhibiting Change in Service Organizations and Their Clients. Horvath WJ (ed). Ann Arbor, Michigan, pp. 62-80, 1976.

168. Luepker RV, Murray DM, Jacobs DR, Mittlemark MB, Bracht N, Carlaw R, et al. Community education for cardiovascular disease prevention: risk factor changes in the Minnesota Heart Health Program. *Am J Public Health*. 1994;84:1383-93.
169. Carleton RA, Lasater TM, Assaf AR, Feldman HA, McKinlay S, and the Pawtucket Heart Health Program Writing Group. The Pawtucket Heart Health Program: community changes in cardiovascular risk factors and projected disease risk. *Am J Public Health*. 1995;85:777-85.
170. Hayward K, Colman R. The tides of change. Addressing inequity and chronic disease in Atlantic Canada. A discussion paper prepared for the Population and Public Health Branch, Atlantic Regional Office, Health Canada; 2003.
171. Di Ruggiero E, Frank J, Moloughney B. Strengthen Canada's Public Health System Now [Editorial]. *Can J Public Health*. 2004;95(1):5.
172. Moloughney B, Frank J, Di Ruggiero E. Revamp Canada's public health system- and do it quickly: think-tank. *CMAJ*. 2003;169(4):325.
173. Mills C, Manske S, Dobbins M, Cameron R. From Stroke Prevention to Health Gain. Final Report. Waterloo: CCS/NCIC Centre for Behavioural and Program Evaluation, University of Waterloo; 2002.
174. Canadian Institute for Health Information & Institute of Population and Public Health Charting the course: a pan-Canadian consultation on public health priorities. Ottawa: CIHI, 2002.
175. Schabas R. Public health: what is to be done? [Commentary] *CMAJ*. 2002;166(10):1282-3.

176. Jensen L, Kisely S. Public health in Atlantic Canada: a discussion paper. Prepared for the Public Health Agency of Canada, Atlantic Regional Office; 2005.
177. MacLean DR. Positioning dissemination in public health policy. *Can J Public Health* 1996;87(suppl 2):S40-S43.
178. Farquhar JW. The case for dissemination research in health promotion and disease prevention. *Can J Public Health* 87(Suppl 2);1996: S44-S49.
179. Lomas J. Using 'linkage and exchange' to move research into policy at a Canadian foundation. *Health Affairs* 2000;19(3): 236-240.
180. Dearing JW, Maibach EW, Buller DB. A convergent diffusion and social marketing approach for disseminating proven approaches to physical activity promotion. *Am J Prev Med* 2006;31(4S): S11-S23.
181. Hall MH, Barr CW, Easwaramoorthy M, Sokolowski SW, Salamon LM. The Canadian nonprofit and voluntary sector in comparative perspective. Toronto: Imagine Canada; 2005.
182. Anderson M, Crosby J, Swan B, Moore H, Broekhoven M. The use of research in local health service agencies. *Soc Sci Med* 1999;49:1007-1019.
183. Kelsey JL, Whittemore AS, Evans AS, Thompson WD. Methods in observational epidemiology. 2nd edition. New York: Oxford University Press; 1996.
184. Hernán MA, Hernández-Díaz S, Werler MM, Mitchell AA. Causal knowledge as a prerequisite for confounding evaluation: An application to birth defects epidemiology. *Am J Epidemiol* 2002;155:176-184.

185. Landis JR, Koch GG. An application of hierarchical kappa-type statistics in the assessment of majority agreement among multiple observers. *Biometrics* 1977;33:363-374.
186. Haynes SN, Richard CS, Kubany ES. Content validity in psychological assessment: A functional approach to concepts and methods. *Psychol Assess* 1995;7(3):238-247.
187. Streiner DL, Norman GR. Health measurement scales: a practical guide to their development and use. 3rd ed. New York: Oxford University Press; 2003.
188. Glick WH, Huber GP, Miller CC, Doty DH, Sutcliffe KM. Studying changes in organizational design and effectiveness: Retrospective event histories and periodic assessments *Organizational Science* 1990;1:293-312.
189. Hughes LC, Preski S. Using key informant methods in organizational survey research: Assessing for informant bias. *Res Nurs Health*. 1997;20:81-92.
190. Mitchell V. Using industrial key informants: Some guidelines. *J Mark Res Soc* 1994;36:139-144.
191. Krannich RS, Humphrey CR. Using key informant data in comparative community research: An empirical assessment. *Sociol Methods Res* 1986;14:473-493.
192. Donaldson SI, Grant-Vallone EJ. Understanding self-report bias in organizational behavior research. *J Bus Psychol* 2002;17:245-260.
193. Rothman KJ. *Modern epidemiology*. Boston: Little, Brown and Co.;1986.
194. Earp JA, Ennett ST. Conceptual models for health education research and practice. *Health Educ Res* 1991;6:163-171

APPENDIX 1

APPENDIX 2

APPENDIX 3

APPENDIX 4

Canadian Heart Health Dissemination Project - National Survey
Organizational Typing/Key Informant Identification

Interviewer: _____

Name of Organization: _____

Name of Senior Contact: _____

Organization Division: ☐ Organization
☐ Centre
☐ Division
☐ Health Service Delivery Area (*need to obtain informant names for each area*)
☐ Department
☐ Unit
☐ Head office
☐ Provincial Branch (*if there are regional branches need to complete Q11, 12 & 13*)

Call Attempt 1 Date: _____ EST: _____ LT: _____

Call Attempt 2 Date: _____ EST: _____ LT: _____

Call Attempt 3 Date: _____ EST: _____ LT: _____

Call Attempt 4 Date: _____ EST: _____ LT: _____

EST = Eastern Standard Time; LT = Key Informant Local Time

Hello /Good Morning / Good Afternoon _____ (*insert name of Senior Contact*).

My name is _____ and I am calling from McGill University in Montreal, Quebec on behalf of the Canadian Heart Health Dissemination Project – National Survey.

I am following-up on the letter that we sent to you recently describing the objectives of this National Survey.

Did you receive the letter?

- ☐ Yes
☐ No (Explain study immediately and offer to fax the letter as soon as phone conversation is ended)

As detailed in the letter, we are contacting approximately 400 public health organizations across Canada working in chronic disease prevention.

Your _____ (*insert organizational division*) has been identified as working in chronic disease prevention and I am calling to ask you if your _____ (*insert organizational division*) is interested in participating in this survey?

The survey consists of a telephone interview lasting 40-50 minutes with 1-2 key informant(s) to be named by you. Is your _____ (*insert organizational division*) interested in participating?

- ☐ Yes → Go to Page 5
☐ No (reason):

(*If no*) Would you be so kind as to answer a few questions (Q1-8) about the characteristics of your organization? This will help us better understand how representative our sample of organizations that agree to participate is, of all organizations across Canada. This will take about 2 minutes.

1. **How long has your organization been in operation, regardless of all its evolutions?**

_____ months, if less than 1 year **OR** _____ years

2. **Which of the following best describes your organization?** *Choose one response only.*

- ☐ 1 Federal or Provincial Government
- ☐ 2 Regional Health Authority
- ☐ 3 Public Health Dept/Agency
- ☐ 4 Para-governmental Health Agency
- ☐ 5 Non-governmental, Not-for-profit organization
- ☐ 6 Professional Association
- ☐ 7 Research Centre
- ☐ 8 Resource Centre
- ☐ 9 Coalition, partnership, alliance or consortium
- ☐ 10 Other (specify): _____

3. **Excluding consultants and short term contractual employees, how many FTEs (Full Time Equivalents) work in your organization?**

_____ FTEs
_____ Don't know

4. **Excluding consultants and short term contractual employees, how many FTEs (Full Time Equivalents) work in your (organization)?**

_____ FTEs
_____ Not applicable (responding with reference to the entire organization)
_____ Don't know

5. **On average, how many volunteers (including Board members) work for your organization each year?** *Do not include students and interns.*

_____ None → *Go to Question 7*
_____ Volunteers on average per year
_____ Don't know

6. **How many volunteers does your organization have in total, at the time of the year when there are the most volunteers?** *Do not include students and interns*

_____ Volunteers at maximum number

_____ Don't know

_____ Not applicable (the number of volunteers does not fluctuate substantially)

7. **What geographical area does your organization serve?** *Choose one response only.*

- ☐ Region
☐ Province
☐ Multi-province/territory
☐ Canada

8. **Please think about the last three years. How would you describe your _____'s (insert organizational division) primary target audience?**
Is it ... ?

	No	Yes	
Other (health) organizations	<input type="checkbox"/>	<input type="checkbox"/>	[RESOURCE]
Population-at-large	<input type="checkbox"/>	<input type="checkbox"/>	[USER]
Both of the above are targeted	<input type="checkbox"/>	<input type="checkbox"/>	[BOTH]
None of the above (please specify primary target): _____	<input type="checkbox"/>	<input type="checkbox"/>	[NOT ELIGIBLE]

END OF QUESTIONS FOR NON-PARTICIPATING ORGANIZATION

These are all the questions I have. On behalf of the Canadian Heart Health Dissemination Project, I thank you for taking the time to speak with me today.

6. **How many volunteers does your organization have in total, at the time of the year when there are the most volunteers?** *Do not include students and interns*

_____ Volunteers at maximum number

_____ Don't know

_____ Not applicable (the number of volunteers does not fluctuate substantially)

7. **What geographical area does your organization serve?** *Choose one response only.*

- ☐ Region
☐ Province
☐ Multi-province/territory
☐ Canada

8. **Please think about the last three years. How would you describe your _____'s (insert organizational division) primary target audience?**
Is it ... ?

	No	Yes	
Other (health) organizations	<input type="checkbox"/>	<input type="checkbox"/>	[RESOURCE]
Population-at-large	<input type="checkbox"/>	<input type="checkbox"/>	[USER]
Both of the above are targeted	<input type="checkbox"/>	<input type="checkbox"/>	[BOTH]
None of the above (please specify primary target): _____	<input type="checkbox"/>	<input type="checkbox"/>	[NOT ELIGIBLE]

END OF QUESTIONS FOR NON-PARTICIPATING ORGANIZATION

These are all the questions I have. On behalf of the Canadian Heart Health Dissemination Project, I thank you for taking the time to speak with me today.

10. If Organization is Resource OR User:

At this point, in order to schedule the telephone interview, I would like to ask you to name 1-2 persons within your _____ (*insert organizational division*) who are very knowledgeable about (*complete the one that applies*):

Yes

☐

transferring chronic disease prevention programs, practices, campaigns, or activities to other organizations that will implement or deliver these programs in a specific population

OR

Yes

☐

the **implementation or delivery** of community-based chronic disease prevention programs, practices, campaigns, or activities in your _____'s (*insert organizational division*) specific target population(s)

In most organizations we will interview only one person. However, in a random sub-sample of 60 organizations, we will be interviewing two people to test the reliability of our questions.

Name of Primary Informant: _____

Position: _____

Address: _____

Tel: _____

Email: _____

Name of Informant #2: _____
Position: _____
Address: _____

Tel: _____
Email: _____

11. Are your regional branches also involved in:

Yes
☐ transferring chronic disease prevention programs, practices, campaigns, or activities to other organizations that will implement or deliver these programs in a specific population

OR

Yes
☐ the implementation or delivery of community-based chronic disease prevention programs, practices, campaigns, or activities in your _____'s (*insert organizational division*) specific target population(s)

No
☐ Specify: _____

12. (if yes) May we contact your managers in each of your regional branches?

☐ No (reason): _____
☐ Yes

13. (if yes) Can you fax or email contact information to me for all your regional branch managers?

☐ Fax _____ → 514-398-5922
☐ Email _____ → samara.dalfen@mail.mcgill.ca

This is all the information I need. In the next two weeks, we will contact (*the person or people*) you have named to schedule an interview. On behalf of the Canadian Heart Health Dissemination Project, I thank you, once again, for agreeing to participate in this survey.

Note to Interviewer: If the senior contact cannot name 2 key informants then the organization must be excluded from the inter-rater reliability study sample.

Inter-rater Reliability Study Sample (check one): ☐ Yes ☐ No

14. If Organization is Both User AND Resource:

At this point, I would like to ask you to identify **1-2 persons** within your _____ (*insert organizational division*) who are very knowledgeable about **transferring** chronic disease prevention programs, practices, campaigns, or activities to other organizations that will implement or deliver these programs in a specific population

AND

1-2 persons who are very knowledgeable the **implementation or delivery** of community-based chronic disease prevention programs, practices, campaigns, or activities in your _____'s (*insert organizational division*) specific target population(s)

Since you have told us that the target audience for your _____ (*insert organizational division*) is split among organizations and populations, we will need to administer 2 separate questionnaires – one to the person very knowledgeable about program transfer to other organizations and one to the person very knowledgeable about prevention program implementation in your target populations.

In most organizations we will interview only one person in each area of activity. However, in a random sample of 60 organizations, we will be interviewing two people in each area of activity to test the reliability of our questions.

Name of Primary Informant : _____

☐ Transfer ☐ Implementation

Position: _____

Address: _____

Tel: _____

Email: _____

Name of Informant #2: _____

Position: _____

Address: _____

Tel: _____

Email: _____

Name of Primary Informant : _____

☐ Transfer ☐ Implementation

Position: _____

Address: _____

Tel: _____

Email: _____

Name of Informant #2: _____

Position: _____

Address: _____

Tel: _____

Email: _____

This is all the information I need.

In the next two weeks, we will contact (*the person or people*) you have named to schedule an interview. On behalf of the Canadian Heart Health Dissemination Project, I thank you once again for agreeing to participate in this survey.

Note: If the senior contact cannot name 2 key informants for **either** questionnaire or **both** questionnaires then the organization must be excluded from the inter-rater reliability study sample

Inter-rater Reliability Study Sample – User Questionnaire (*check one*):

☐ Yes ☐ No

Inter-rater Reliability Study Sample – Resource Questionnaire (*check one*):

☐ Yes ☐ No

APPENDIX 5

Canadian Heart Health Dissemination Project

Survey of Organizations Involved in CDP/HLP

INTERVIEWER VERSION

ID#: _____

Date of Interview: _____ - _____ - _____ Local Time: _____

Interviewer: _____

EST Start (1): _____ EST Finish (2): _____

Length Time (2) – (1) = _____ minutes

✂ _____ ✂ _____ ✂ _____

Name of Respondent _____

Organization _____

Address _____

Telephone Number: _____ (____) _____

Organizational Characteristics

1. How long has your organization been in operation, regardless of all its evolutions?

_____ months, if less than 1 year OR _____ years

2. How would you categorize your organization? *Choose one response only.*

- ☐ 1 Federal or Provincial Government
- ☐ 2 Regional Health Authority
- ☐ 3 Public Health Department or Agency
- ☐ 4 Para-governmental Health Agency
- ☐ 5 Non-governmental organization (NGO), Not-for-profit organization
- ☐ 6 Professional Association
- ☐ 7 Research Centre
- ☐ 8 Resource Centre
- ☐ 9 Coalition (of? specify: _____)
- ☐ 10 Partnership (of? specify: _____)
- ☐ 11 Alliance (of? specify: _____)
- ☐ 12 Consortium (of? specify: _____)
- ☐ 13 Other (specify): _____

3. Excluding consultants and short term contractual employees, how many paid FTEs (Full Time Equivalents) work in your whole organization?

_____ FTEs

☐ 7 Don't know

4. Excluding consultants and short term contractual employees, how many paid FTEs (Full Time Equivalents) work in your division, department or unit?

_____ FTEs for the division, department or unit

☐ 7 Don't know

5. On average, how many volunteers (including Board members) work for your organization each year? *Do not include students and interns.*

None → Go to Question 7
 Volunteers on average per year
☐7 Don't know number of volunteers

National NGOs: # for head office activities only.
 Provincial NGOs: # for provincial and regional branch activities *only* if we are not contacting the regions individually

6. How many volunteers does your organization have in total at the time of the year when there are the most volunteers? *Do not include students and interns.*

Volunteers at maximum numbers
☐8 Not applicable, number of volunteers does not fluctuate
☐7 Don't know number of volunteers

7. What geographical area does your organization serve? *Choose one response only.*

☐1 Region
☒2 Province
☐3 Multi-province/territory
☒4 Canada

8. What is the size of the population (number of people) in the geographical area that your organization is mandated to serve?

☐1 <50 000
☒2 50 000-100 000
☐3 100 000-200 000
☒4 200 000 ~ 500 000
☐5 >500 000

9. What is (are) the main target population(s) of your organization?

<input type="checkbox"/> 2 Yes	<input type="checkbox"/> 1 No	General population
<input type="checkbox"/> 2 Yes	<input type="checkbox"/> 1 No	People with specific health issues
<input type="checkbox"/> 2 Yes	<input type="checkbox"/> 1 No	People with specific demographic characteristics (e.g., women, a cultural group, youth)
<input type="checkbox"/> 2 Yes	<input type="checkbox"/> 1 No	People living in specific regions or areas
<input type="checkbox"/> 2 Yes	<input type="checkbox"/> 1 No	Practitioners
<input type="checkbox"/> 2 Yes	<input type="checkbox"/> 1 No	Members of this organization
<input type="checkbox"/> 2 Yes	<input type="checkbox"/> 1 No	Other (specify): _____

Involvement with and priority of CDP/HLP

10. Does your organization's mission statement refer to chronic disease prevention or healthy lifestyle promotion?

☐₂ Yes

☐₁ No

☐₇ Don't know

☐₈ Organization does not have a mission statement

11. What does chronic disease prevention/healthy lifestyle promotion mean in your organization?
-
-

12. In the last 3 years, has your organization undertaken any chronic disease prevention or healthy lifestyle promotion activities for: (Give an answer for each item)

☐₂ Yes

☐₁ No

Tobacco control

☐₂ Yes

☐₁ No

Physical activity

☐₂ Yes

☐₁ No

Healthy eating

☐₂ Yes

☐₁ No

Blood pressure control

☐₂ Yes

☐₁ No

Cholesterol control

☐₂ Yes

☐₁ No

Diabetes

☐₂ Yes

☐₁ No

Obesity

☐₂ Yes

☐₁ No

Healthy lifestyle

☐₂ Yes

☐₁ No

Other (specify)

Activities should not be considered if they are indirectly undertaken. The factor should be mentioned in written documentation (ex. aims or objectives).

13. In your organization, is the responsibility for CDP/HLP: (Give an answer for each item)

Assigned to a specific unit or department?

☐₁ No

☐₂ Yes: what is its name? _____

Assigned to a specific manager(s)?

☐₁ No

☐₂ Yes

Part of all managers' jobs?

☐₁ No

☐₂ Yes

Part of the Board's mandate?

☐₁ No

☐₂ Yes

14. On a scale from 1 to 5, where 1 is very low priority and 5 is very high priority, what is the current level of priority of CDP/HLP (in terms of human and financial resource allocation) in your organization?

Level of priority of CDP/HLP within your organization.

VERY LOW PRIORITY	LOW PRIORITY	MODER ATE	HIGH PRIORITY	VERY HIGH PRIORITY
1	2	3	4	5

15. In the last 3 years has this level of priority.....

- ☐ ₁ Increased a lot
☐ ₂ Increased a little
☐ ₃ Remained stable
☐ ₄ Decreased a little
☐ ₅ Decreased a lot

Organizational Capacity for CDP/HLP

16. On a scale from 1 to 5 where 1 is strongly disagree and 5 is strongly agree, would you agree or disagree that:

In your organization:	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
Staff have timely access to information they need about CDP/HLP.	1	2	3	4	5
Decisions about CDP/HLP activities are made in a timely fashion.	1	2	3	4	5
Staff are routinely involved in management's decisions about CDP/HLP programming.	1	2	3	4	5
Internal communication about CDP/HLP is effective.	1	2	3	4	5
External communication about CDP/HLP is effective.	1	2	3	4	5
CDP/HLP activities are coordinated with the other activities of the entire organization.	1	2	3	4	5
Innovation in CDP/HLP is encouraged.	1	2	3	4	5
Learning is considered an important objective in day-to-day work on CDP/HLP.	1	2	3	4	5

17. On a scale from 1 to 5 where 1 is strongly disagree and 5 is strongly agree, would you agree or disagree that:

In your organization:	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
Everyone is encouraged to show leadership for CDP/HLP within their jobs.	1	2	3	4	5
Staff take on leadership roles for CDP/HLP activities.	1	2	3	4	5
Managers are accessible regarding CDP/HLP activities.	1	2	3	4	5
Managers are responsive to CDP/HLP issues.	1	2	3	4	5
Managers are receptive to new ideas for CDP/HLP.	1	2	3	4	5

18. On a scale from 1 to 5 where 1 is strongly disagree and 5 is strongly agree, would you agree or disagree that:

In your organization:	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
Staffing levels are adequate to carry out CDP/HLP activities.	1	2	3	4	5
Staff are hired specifically to conduct CDP/HLP activities.	1	2	3	4	5
There is an appropriate level of administrative support for CDP/HLP.	1	2	3	4	5
There are professional development opportunities to learn about CDP/HLP.	1	2	3	4	5
Staff participate in CDP/HLP professional development opportunities.	1	2	3	4	5

19. In your organization, is funding for CDP/HLP.....

- ☐₂ Yes ☐₁ No Secure indefinitely
☐₂ Yes ☐₁ No Determined year by year
☐₂ Yes ☐₁ No Time limited, project or contract based (i.e. soft funding)
☐₈ No funding for CDP/HLP (skip to Q. 21)

20. Does your organization currently have a separate budget line for CDP/HLP?

- ☐₂ Yes
☐₁ No
☐₇ Don't know

21. In the past 3 years, has your organization:

- ☐₂ Yes ☐₁ No (skip to Q.23) *Applied* for funds from outside sources to support CDP/HLP activities?
☐₂ Yes ☐₁ No (skip to Q.23) *Received* funds from outside sources to support CDP/HLP activities?

22. Has your organization received this external funding from any of the following?

<input type="checkbox"/> ₂ Yes	<input type="checkbox"/> ₁ No	Research funding organization such as CIHR (Canadian Institutes of Health Research)
<input type="checkbox"/> ₂ Yes	<input type="checkbox"/> ₁ No	Health Canada
<input type="checkbox"/> ₂ Yes	<input type="checkbox"/> ₁ No	Other federal ministry
<input type="checkbox"/> ₂ Yes	<input type="checkbox"/> ₁ No	Ministry/Department of Health (provincial)
<input type="checkbox"/> ₂ Yes	<input type="checkbox"/> ₁ No	Other provincial ministry
<input type="checkbox"/> ₂ Yes	<input type="checkbox"/> ₁ No	National NGO
<input type="checkbox"/> ₂ Yes	<input type="checkbox"/> ₁ No	Provincial NGO (including provincial chapter of a national NGO)
<input type="checkbox"/> ₂ Yes	<input type="checkbox"/> ₁ No	Municipality
<input type="checkbox"/> ₂ Yes	<input type="checkbox"/> ₁ No	Major public charity (e.g. Trillium Foundation, United Way /Centraide)
<input type="checkbox"/> ₂ Yes	<input type="checkbox"/> ₁ No	Private foundation
<input type="checkbox"/> ₂ Yes	<input type="checkbox"/> ₁ No	Private funding (ex. Industry)
<input type="checkbox"/> ₂ Yes	<input type="checkbox"/> ₁ No	Fund raising
<input type="checkbox"/> ₂ Yes	<input type="checkbox"/> ₁ No	Other (specify) _____

23. On a scale of 1 to 5, where 1 is much less than adequate and 5 is more than adequate, how adequate are the following in your organization?

	MUCH LESS THAN ADEQUATE	LESS THAN ADEQUATE	NEUTRAL	ADEQUATE	MORE THAN ADEQUATE
Funding levels for CDP/HLP activities.	1	2	3	4	5
Funding levels for monitoring and evaluation of CDP/HLP activities.	1	2	3	4	5
Access to material resources for CDP/HLP activities.	1	2	3	4	5

24. On a scale from 1 to 5, where 1 is strongly disagree and 5 is strongly agree, would you agree or disagree that:

	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
Current levels of partnering with other organizations are adequate for effective CDP/HLP.	1	2	3	4	5
Partnerships with other organizations are bringing new ideas about CDP/HLP to your organization.	1	2	3	4	5
Partnerships with other organizations are bringing new resources for CDP/HLP to your organization.	1	2	3	4	5
Your organization's level of participation in coalitions and networks is adequate for effective CDP/HLP.	1	2	3	4	5
The number of organizations that you are connected to through networks concerned with CDP/HLP has increased in the last 3 years.	1	2	3	4	5

25. How many CDP/HLP -related coalitions/networks does your organization currently belong to? (include only formal networks or coalitions, i.e., that have an established, written structure and mission)

Include only formal networks or coalitions, i.e., that have an established, written structure and mission.

26. How many organizations/groups does your organization partner with in CDP/HLP activities?

'To partner' means to share resources for conducting common activities.

In the following questions, you are asked to rate your organization's skill level for CDP/HLP activities on a scale from 1 to 5 where 1 is poor and 5 is very good and your organization's involvement in CDP/HLP activities on a scale from 1 to 5 where 1 is very low involvement and 5 is very high involvement.

27. Think about the last 3 years. How would you rate your organization's skill level for, and involvement in CDP/HLP activities that address the following **factors**? (Level of involvement means the amount of effort or activity that your organization has devoted to this factor in the last three years, as a proportion of your total effort in CDP/HLP).

	SKILL LEVEL					INVOLVEMENT LEVEL				
	POOR	FAIR	MODE- RATE	GOOD	VERY GOOD	VERY LOW	LOW	MODER- ATE	HIGH	VERY HIGH
Tobacco control	1	2	3	4	5	1	2	3	4	5
Healthy eating	1	2	3	4	5	1	2	3	4	5
Physical activity	1	2	3	4	5	1	2	3	4	5
Social support	1	2	3	4	5	1	2	3	4	5
Stress	1	2	3	4	5	1	2	3	4	5
Self-esteem	1	2	3	4	5	1	2	3	4	5
Socio-economic status	1	2	3	4	5	1	2	3	4	5
Work conditions	1	2	3	4	5	1	2	3	4	5
Social exclusion	1	2	3	4	5	1	2	3	4	5
Income inequality	1	2	3	4	5	1	2	3	4	5

28. Think about the last three years. How would you rate your organization's skill level for, and involvement in, the following needs assessment activities?

	SKILL LEVEL					INVOLVEMENT LEVEL				
	POOR	FAIR	MODE- RATE	GOOD	VERY GOOD	VERY LOW	LOW	MODER- ATE	HIGH	VERY HIGH
Assessing the burden of disease in your organization's target population(s)	1	2	3	4	5	1	2	3	4	5
Assessing prevalence of risk factors in your organization's target populations	1	2	3	4	5	1	2	3	4	5
Identifying community cultural, and organizational factors that influence CDP/HLP activities	1	2	3	4	5	1	2	3	4	5
Reviewing CDP/HLP activities of other organizations to find gaps in programming for your target population(s)	1	2	3	4	5	1	2	3	4	5
Reviewing CDP/HLP activities developed by other organizations to see if they can be used by your organization	1	2	3	4	5	1	2	3	4	5
Finding relevant best practices in CDP/HLP to see if they can be used by your organization	1	2	3	4	5	1	2	3	4	5
Reviewing research to help develop CDP/HLP priorities	1	2	3	4	5	1	2	3	4	5
Assessing the organization's strengths and limitations in CDP/HLP	1	2	3	4	5	1	2	3	4	5
Consulting with community members to identify priorities for CDP/HLP	1	2	3	4	5	1	2	3	4	5

29. How often does your organization undertake strategic planning to identify priorities for CDP/HLP?

- ☐ ₁ Never
☐ ₂ Annually
☐ ₃ Every 2-3 years
☐ ₄ Every 5 years
☐ ₅ Other (specify) : _____

30. Think about the last three years. How would you rate your organization's skill level for, and involvement in, planning activities?

	SKILL LEVEL					INVOLVEMENT LEVEL				
	POOR	FAIR	MODERATE	GOOD	VERY GOOD	VERY LOW	LOW	MODERATE	HIGH	VERY HIGH
Using theoretical frameworks to guide development of CDP/HLP activities.	1	2	3	4	5	1	2	3	4	5
Setting goals and objectives for CDP/HLP	1	2	3	4	5	1	2	3	4	5
Reviewing our resources to assess feasibility of CDP/HLP activities	1	2	3	4	5	1	2	3	4	5
Developing action plans for CDP/HLP	1	2	3	4	5	1	2	3	4	5
Designing, monitoring and evaluation of CDP/HLP	1	2	3	4	5	1	2	3	4	5

31. Think about the last three years. How would you rate your organization's skill level for strategies to implement CDP/HLP? (This includes work done by your organization alone or in partnership with others)

	SKILL LEVEL				
	POOR	FAIR	MODERATE	GOOD	VERY GOOD
Group development	1	2	3	4	5
Public awareness & education	1	2	3	4	5
Skill building at the individual level	1	2	3	4	5
Healthy public policy development	1	2	3	4	5
Advocacy	1	2	3	4	5
Partnership building	1	2	3	4	5
Community mobilization	1	2	3	4	5
Facilitation of self-help groups	1	2	3	4	5
Service provider skill building	1	2	3	4	5
Creating healthy environments	1	2	3	4	5
Volunteer recruitment & development	1	2	3	4	5

32. On a scale from 1 to 5, where 1 is strongly disagree and 5 is strongly agree, would you agree or disagree that:

In your organization:	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
There is a written monitoring and evaluation policy for CDP/HLP.	1	2	3	4	5
Monitoring and evaluation information about our CDP/HLP activities is available.	1	2	3	4	5
Lessons learned from monitoring and evaluation of CDP/HLP activities are used to make changes.	1	2	3	4	5

33. Think about the last three years. How would you rate your organization's skill level for, and involvement in, the following evaluation activities?

	SKILL LEVEL					INVOLVEMENT LEVEL				
	POOR	FAIR	MODE- RATE	GOOD	VERY GOOD	VERY LOW	LOW	MODER- ATE	HIGH	VERY HIGH
Monitoring CDP/HLP activities	1	2	3	4	5	1	2	3	4	5
Measuring achievement of CDP/HLP objectives.	1	2	3	4	5	1	2	3	4	5
Using quantitative methods to assess impacts of CDP/HLP	1	2	3	4	5	1	2	3	4	5
Using qualitative methods to assess impacts of CDP/HLP	1	2	3	4	5	1	2	3	4	5
Undertaking long term follow-up with the target population for CDP/HLP	1	2	3	4	5	1	2	3	4	5
Identifying best practices for CDP/HLP	1	2	3	4	5	1	2	3	4	5

34. In the last three years, did your organization implement, in a specific target population, a completely new or a newly adapted version of an existing CDP/HLP program, practice, campaign or activity that had been developed by another organization?

☐₂ Yes If yes, how many different ones? _____
☐₇₇ Don't Know

☐₁ No (Go to question 41)

For the CDP/HLP program, practice, campaign or activity developed by another organization that your organization used MOST RECENTLY:

35. Which of the following best describes the overall aim of this CDP/HLP program, practice, campaign or activity? Choose one response only.

- ☐ 1 Changing public policy
- ☒ 2 Creating supportive environments
- ☐ 3 Strengthening community action
- ☒ 4 Skill building
- ☐ 5 Capacity building
- ☒ 6 Risk reduction
- ☐ 7 Knowledge transfer
- ☒ 8 Re-orienting health services toward health promotion
- ☐ 9 Prevention strategies (population approach, community development, etc).
- ☒ 10 Other (specify): _____

36. Which of the following best describes the type of this CDP/HLP program, practice, campaign or activity? Choose one response only.

- ☐ 1 Training program
- ☒ 2 Training material
- ☐ 3 Kit
- ☒ 4 Resource
- ☐ 5 Practical tool
- ☒ 6 Practice guidelines
- ☐ 7 Campaign
- ☒ 8 Pamphlet
- ☐ 9 Policy
- ☒ 10 Intervention
- ☐ 11 School-based program
- ☒ 12 Other (specify): _____

37. What kind of organization developed this CDP/HLP _____ (response to Question 36)? Choose one response only.

- ☐ 1 Federal or Provincial Government
- ☒ 2 Regional Health Authority
- ☐ 3 Public Health Department or Agency
- ☒ 4 Para-governmental Health Agency
- ☐ 5 Non-governmental organization (NGO), Not-for-profit organization
- ☒ 6 Professional Association
- ☐ 7 Research Centre
- ☒ 8 Resource Centre
- ☐ 9 Coalition (of? specify: _____)
- ☒ 10 Partnership (of? specify: _____)
- ☐ 11 Alliance (of? specify: _____)
- ☒ 12 Consortium (of? specify: _____)
- ☐ 13 Other (specify): _____

38. How did your organization first become aware of this CDP/HLP _____ (response to Question 36)? *Check one response only.*

- ☐ 1 through your own deliberate search
- ☒ 2 through communication with colleagues
- ☐ 3 through information provided by the organization that developed it
- ☒ 4 through generally available information channels
- ☐ 5 by accident
- ☒ 6 other (specify): _____

☐ 7 don't know

39. When you used this CDP/HLP _____ (response to Question 36), did you: *Check one response only.*

- ☐ 1 use it without making any changes?
- ☒ 2 make minor changes to it?
- ☐ 3 make major changes to it ?
- ☒ 4 use only the basic idea and change everything else?

40. The blank (_____) in the following questions refers to your response in Question 36. On a scale from 1 to 5, where 1 is strongly disagree and 5 is strongly agree, would you agree or disagree that:

	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
The organization that developed the _____ was focused on your organization's needs during the development process.	1	2	3	4	5
Ideas from your organization were included in the development of the _____.	1	2	3	4	5
When your organization was adopting the _____, the organization that developed it focused on your needs during the adoption process.	1	2	3	4	5
Ideas from your organization were included at every step of the process of adopting the _____.	1	2	3	4	5
The organization that developed the _____ limited the information it shared with your organization.	1	2	3	4	5
The organization that developed the _____ made it a priority to understand your organizations' culture.	1	2	3	4	5
The organization that developed the _____ treated your organization as an equal partner during the development process.	1	2	3	4	5
The organization that developed the _____ treated your organization as an equal partner while you were adopting it.	1	2	3	4	5

Now, please return to thinking about your organization as a whole over the last three years.

Implementation of CDP/HLP Activities

The questions in this section are about your tobacco control, physical activity, healthy eating and multi-risk factor activities in different settings and using different strategies.

41. TOBACCO CONTROL

Does your organization do any tobacco control activities that address tobacco alone, without any other risk factors?

- ☐ ₁ No → Does your organization do any tobacco control activities that are part of multi-risk factor activities?
- ☐ ₁ No → Is tobacco control part of your organization's mandate?
- ☐ ₁ No → Question 42 does not apply
- ☐ ₂ Yes → Answer Question 42.
- ☐ ₂ Yes → Answer Question 47 about these activities.
- Do not answer Question 42.

☐ ₂ Yes → Answer Question 42 about these activities.

42. On a scale from 1 to 5, where 1 is very low involvement and 5 is very high involvement, how would you rate your organization's level of involvement in tobacco control activities in the following settings?

If no activities are conducted in a setting, rate this as "very low involvement".

	VERY LOW	LOW	MODERATE	HIGH	VERY HIGH
Schools	1	2	3	4	5
Workplaces	1	2	3	4	5
Health Care Settings	1	2	3	4	5
Community at large	1	2	3	4	5
Other : _____	1	2	3	4	5

43. PHYSICAL ACTIVITY

Does your organization do any physical activity activities that address physical activity alone, without any other risk factors?

- ☐ ₁ No → Does your organization do any physical activity activities that are part of multi-risk factor activities?
- ☐ ₁ No → Is physical activity part of your organization's mandate?
- ☐ ₁ No → Question 44 does not apply
- ☐ ₂ Yes → Answer Question 44.
- ☐ ₂ Yes → Answer Question 47 about these activities.
- Do not answer Question 44.

☐ ₂ Yes → Answer Question 44 about these activities.

44. On a scale from 1 to 5, where 1 is very low involvement and 5 is very high involvement, how would you rate your organization's level of involvement in physical activity activities in the following settings?

If no activities are conducted in a setting, rate this as "very low involvement".

	VERY LOW	LOW	MODERATE	HIGH	VERY HIGH
Schools	1	2	3	4	5
Workplaces	1	2	3	4	5
Health Care Settings	1	2	3	4	5
Community at large	1	2	3	4	5
Other : _____	1	2	3	4	5

45. HEALTHY EATING

Does your organization do any healthy eating activities that address healthy eating alone, without any other risk factors?

- ☐ ₁ No → Does your organization do any healthy eating activities that are part of multi-risk factor activities?
- ☐ ₁ No → Is healthy eating part of your organization's mandate?
- ☐ ₂ Yes → Answer Question 46.
- ☐ ₂ Yes → Answer Question 47 about these activities.
- Do not answer Question 46.

☐ ₂ Yes → Answer Question 46 about these activities.

46. On a scale from 1 to 5, where 1 is very low involvement and 5 is very high involvement, how would you rate your organization's level of involvement in healthy eating activities in the following settings?

If no activities are conducted in a setting, rate this as "very low involvement".

	VERY LOW	LOW	MODERATE	HIGH	VERY HIGH
Schools	1	2	3	4	5
Workplaces	1	2	3	4	5
Health Care Settings	1	2	3	4	5
Community at large	1	2	3	4	5
Other : _____	1	2	3	4	5

47. MULTI-RISK FACTOR

Does your organization do any multi-risk factor activities that address a combination of tobacco control, physical activity and/or healthy eating, or with other risk factors?

- ☐ ₁ No → Are multi-risk factor activities a part of your organization's mandate?
- ☐ ₁ No → Question 48 does not apply
- ☐ ₂ Yes → Answer Question 48.

- ☐ ₂ Yes → What risk factors are addressed in your organization's multi-risk factor activities?

- ☐ ₁ Tobacco control
- ☐ ₂ Physical activity
- ☐ ₃ Healthy eating
- ☐ ₄ Other _____

Answer Question 48

48. On a scale from 1 to 5, where 1 is very low involvement and 5 is very high involvement, how would you rate your organization's level of involvement in multi-risk factor activities in the following settings?

If no activities are conducted in a setting, rate this as "very low involvement".

	VERY LOW	LOW	MODERATE	HIGH	VERY HIGH
Schools	1	2	3	4	5
Workplaces	1	2	3	4	5
Health Care Settings	1	2	3	4	5
Community at large	1	2	3	4	5
Other : _____	1	2	3	4	5

49. TOBACCO CONTROL

51. PHYSICAL ACTIVITY

Did you answer Question 41?

☐₂ Yes → Answer Question 50
☐₁ No → Go to Question 51

50. Think about the last three years. On a scale from 1 to 5 where 1 is very low involvement and 5 is very high involvement, how would you rate your organization's level of involvement in tobacco control activities using the following strategies?

If no activities are conducted using these strategies, rate this as "very low involvement".

	VERY LOW	LOW	MODERATE	HIGH	VERY HIGH
Group development	1	2	3	4	5
Public education	1	2	3	4	5
Skill building at the individual level	1	2	3	4	5
Healthy public policy development	1	2	3	4	5
Advocacy	1	2	3	4	5
Partnership building	1	2	3	4	5
Community mobilization	1	2	3	4	5
Facilitation of self-help groups	1	2	3	4	5
Service provider skill building	1	2	3	4	5
Creating healthy environments	1	2	3	4	5
Volunteer development	1	2	3	4	5

Did you answer Question 43?

☐₂ Yes → Answer Question 52
☐₁ No → Go to Question 53

52. Think about the last three years. On a scale from 1 to 5 where 1 is very low involvement and 5 is very high involvement, how would you rate your organization's level of involvement in physical activity activities using the following strategies?

If no activities are conducted using these strategies, rate this as "very low involvement".

	VERY LOW	LOW	MODERATE	HIGH	VERY HIGH
Group development	1	2	3	4	5
Public education	1	2	3	4	5
Skill building at the individual level	1	2	3	4	5
Healthy public policy development	1	2	3	4	5
Advocacy	1	2	3	4	5
Partnership building	1	2	3	4	5
Community mobilization	1	2	3	4	5
Facilitation of self-help groups	1	2	3	4	5
Service provider skill building	1	2	3	4	5
Creating healthy environments	1	2	3	4	5
Volunteer development	1	2	3	4	5

53. HEALTHY EATING

55. MULTI-RISK FACTOR

Did you answer Question 45?

- ☐₂ Yes → Answer Question 54
☐₁ No → Go to Question 55

54. Think about the last three years. On a scale from 1 to 5 where 1 is very low involvement and 5 is very high involvement, how would you rate your organization's level of involvement in healthy eating activities using the following strategies?

If no activities are conducted using these strategies, rate this as "very low involvement".

	VERY LOW	LOW	MODERATE	HIGH	VERY HIGH
Group development	1	2	3	4	5
Public education	1	2	3	4	5
Skill building at the individual level	1	2	3	4	5
Healthy public policy development	1	2	3	4	5
Advocacy	1	2	3	4	5
Partnership building	1	2	3	4	5
Community mobilization	1	2	3	4	5
Facilitation of self-help groups	1	2	3	4	5
Service provider skill building	1	2	3	4	5
Creating healthy environments	1	2	3	4	5
Volunteer development	1	2	3	4	5

Did you answer Question 47?

- ☐₂ Yes → Answer Question 56
☐₁ No → Go to Question 57

56. Think about the last three years. On a scale from 1 to 5 where 1 is very low involvement and 5 is very high involvement, how would you rate your organization's level of involvement in multi-risk factor activities using the following strategies?

If no activities are conducted using these strategies, rate this as "very low involvement".

	VERY LOW	LOW	MODERATE	HIGH	VERY HIGH
Group development	1	2	3	4	5
Public education	1	2	3	4	5
Skill building at the individual level	1	2	3	4	5
Healthy public policy development	1	2	3	4	5
Advocacy	1	2	3	4	5
Partnership building	1	2	3	4	5
Community mobilization	1	2	3	4	5
Facilitation of self-help groups	1	2	3	4	5
Service provider skill building	1	2	3	4	5
Creating healthy environments	1	2	3	4	5
Volunteer development	1	2	3	4	5

Facilitators and Barriers to CDP/HLP

57. To what extent were the following factors facilitators or barriers to CDP/HLP activities within your organization, in the last 3 years? *For example, if a factor was neither a barrier nor a facilitator or was not at all relevant, rate it 0. If it was a very strong facilitator, rate it plus 3. If it was a very strong barrier, rate it minus 3.*

	BARRIER			NEITHER		FACILITATOR	
Level of board support for CDP/HLP	-3	-2	-1	0	+1	+2	+3
Commitment to CDP/HLP by senior management	-3	-2	-1	0	+1	+2	+3
Funding for CDP/HLP activities	-3	-2	-1	0	+1	+2	+3
Number of paid staff working on CDP/HLP	-3	-2	-1	0	+1	+2	+3
Financial support for CDP/HLP professional development	-3	-2	-1	0	+1	+2	+3
Organizational structure for CDP/HLP	-3	-2	-1	0	+1	+2	+3
Staff experience with CDP/HLP	-3	-2	-1	0	+1	+2	+3
Internal coordination of CDP/HLP activities	-3	-2	-1	0	+1	+2	+3
Level of target population interest in CDP/HLP	-3	-2	-1	0	+1	+2	+3
Level of public understanding of CDP/HLP	-3	-2	-1	0	+1	+2	+3
Availability of CDP/HLP research	-3	-2	-1	0	+1	+2	+3
Availability of CDP/HLP data about your specific target populations	-3	-2	-1	0	+1	+2	+3
Level of provincial priority for CDP/HLP	-3	-2	-1	0	+1	+2	+3
Level of national priority for CDP/HLP	-3	-2	-1	0	+1	+2	+3
Access to provincial resource organizations for CDP/HLP	-3	-2	-1	0	+1	+2	+3
Usefulness of the provincial resource organizations for CDP/HLP	-3	-2	-1	0	+1	+2	+3
Access to related national resource organizations for CDP/HLP	-3	-2	-1	0	+1	+2	+3
Usefulness of the national resource organizations for CDP/HLP	-3	-2	-1	0	+1	+2	+3
Level of provincial/ministry support for CDP/HLP capacity building	-3	-2	-1	0	+1	+2	+3
Level of support for CDP/HLP from partners	-3	-2	-1	0	+1	+2	+3
Number of volunteers for CDP/HLP	-3	-2	-1	0	+1	+2	+3

	BARRIER			NEITHER		FACILITATOR	
Access to media for coverage of CDP/HLP	-3	-2	-1	0	+1	+2	+3
Health system reform	-3	-2	-1	0	+1	+2	+3
Characteristics of your target population or territory	-3	-2	-1	0	+1	+2	+3
Other: specify _____	-3	-2	-1	0	+1	+2	+3

Respondent Characteristics

To finish off, I'd like to ask a few questions about you.

58. Sex ☐₁ Male
☐₂ Female

59. In what age category do you belong?

- ☐₁ 20-29
☐₂ 30-39
☐₃ 40-49
☐₄ 50-59
☐₅ 60-69
☐₆ 70+

60. What is the highest diploma/degree you have completed?

- ☐₁ Diploma
☐₂ Bachelor's
☐₃ Bachelor's + Professional Degree
☐₄ Master's
☐₅ MD
☐₆ PhD
☐₇ Other (specify): _____

61. Which best describes your current position within your organization?

- ☐₁ President/CEO
☐₂ Department Head
☐₃ Director
☐₄ Manager/Supervisor/Team Leader
☐₅ Professional staff (specify)
☐₆ Other (specify)

If respondent is answering on behalf of a coalition, make sure that they are giving their position within the coalition.

62. How long have you been in your current position?

_____ months OR _____ years OR Since _____
month year

63. Is your current position

- ☐₁ Full-time
☐₂ Part-time

If respondent is answering on behalf of a coalition, make sure that they answer with respect to their position *within the coalition*.

64. How many years experience do you have working in CDP/HLP?

_____ years

65. Are you are interested in receiving a summary of the results from this survey?

- ☐₂ Yes
☐₁ No

Fall 2005

66. If yes, please indicate if you would prefer an electronic or hard copy:

- ☐₁ Electronic copy
☐₂ Hard copy

THANK YOU!

APPENDIX 6

Detailed description of variables pertaining to organizational capacity, its determinants and outcomes

Variable questionnaire item(s)	Response categories	Scoring
DETERMINANTS		
Structural		
<i>Age:</i> How long has your organization been in operation, regardless of all its evolutions?	Number of months or years to be indicated	No. of years
<i>Size:</i> Excluding consultants and short term contractual employees, how many FTEs work in your organization?	Number of FTEs to be indicated	SIZE variable created from this item re: number FTEs at entire organizational level and a similar item re: number FTEs at CDP unit/division level. If organizational response was NOT missing then SIZE= No. FTEs at organization level; if organizational response WAS missing and unit/division response was NOT missing then SIZE=No. FTEs at unit/division level.
<i>Geographical area served:</i> What geographical area does your organization serve?	1. Region 2. Province 3. Multi-province territory 4. Canada	Score assigned to each response category as coded
<i>Size population served:</i> What is the size of the population (number of people) in the geographical area that your organization is mandated to serve?	1. <50 000 2. 50 000-100 000 3 100 000 – 200 000 4. 200 000-500 000 5. > 500 000	Score assigned to each response category as coded

Variable questionnaire item(s)		Response categories	Scoring
Organizational			
(1) Supports			
<i>Managerial:</i> Indicate your level of agreement that in your organization: (i) decisions about CDP/HLP activities are made in a timely fashion; (ii) staff are routinely involved in management's decisions about CDP/HLP programming; (iii) internal communication about CDP/HLP is effective; (iv) innovation in CDP/HLP is encouraged; (v) everyone is encouraged to show leadership for CDP/HLP within their jobs; (vi) staff take on leadership roles for CDP/HLP activities; (vii) managers are accessible regarding CDP/HLP activities; (viii) Managers are receptive to CDP/HLP issues; (ix) managers are receptive to new ideas for CDP/HLP.		1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	21 items designed to measure supports for organizational capacity were entered into PCA; 18 items loaded onto three factors; the remaining three items were excluded. Nine of the 21 items loaded onto this factor. Each item scored 1 to 5. The factor-based score for this scale was the mean of all 9 responses.
<i>Staff:</i> Indicate your level of agreement that in your organization: (i) staff has timely access to information they need about CDP/HLP; (ii) staffing levels are adequate to carry out CDP/HLP activities; (iii) staff is hired specifically to conduct CDP/HLP activities; (iv) there is an appropriate level of administrative support for CDP/HLP; (v) there are professional development opportunities to learn about CDP/HLP; (vi) staff participates in CDP/HLP professional development opportunities.		1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	Six of the 21 items designed to measure organizational supports loaded onto this factor. Each item scored 1 to 5. The factor-based score for this scale was the mean of all 6 responses.
<i>Evaluation:</i> Indicate your level of agreement that in your organization (i) there are written monitoring and evaluation policy for CDP/HLP; (ii) monitoring and evaluation information about your CDP/HLP activities is available; (iii) lessons learned from monitoring and evaluation of CDP/HLP activities are used to make changes		1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	Three of the 21 items designed to measure organizational supports loaded onto this factor. Each item scored 1 to 5. The factor-based score for this scale was the mean of all 3 responses.
(2) Partnerships			
<i>Effectiveness:</i> Indicate your level of agreement (i) Current levels of partnering with other organizations are adequate for effective CDP/HLP; (ii) Partnerships with other organizations are bringing new ideas about CDP/HLP to your organization; (iii) Partnership with other organizations are bringing new resources for CDP/HLP to your organization; (iv) Your organization's level of participation in coalitions and networks is adequate for effective CDP/HLP; (v) The number of organizations that you are		1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	All five items loaded onto one factor. Each item scored 1 to 5. The factor-based score for this scale was the mean of all 5 responses

Variable questionnaire item(s)	Response categories	Scoring
connected to through networks concerned with CDP/HLP has increased in the last 3 years.		
<i>No. partnerships:</i> How many organizations/groups does your organization partner with in CDP activities (to partner means to share resources for conducting common activities)	Number of partnerships	Cumulative frequency quintiled then rankings (0 to 4) re-coded to create a score from 1 to 5.
<i>No. networks:</i> How many CDP-related coalitions/networks does your organization currently belong to (include only formal networks or coalitions, i.e., that have an established written structure and mission)	Number of networks	Cumulative frequency quintiled then rankings (0 to 4) re-coded to create a score from 1 to 5.
ORGANIZATIONAL CAPACITY		
Skills		
<i>SDOH:</i> How would you rate your organization's skills for CDP activities that address the following factors: (i) social support; (ii) self-esteem; (iii) socio-economic status; (iv) work conditions; (v) social exclusion; (vi) income inequality?	1. Poor 2. Fair 3. Moderate 4. Good 5. Excellent	Ten items were entered into PCA to measure skill for behavioral risk factor and SDOH programming. Six of 10 items loaded onto one factor. Each item scored 1 to 5. The factor-based score for this scale was the mean of all 6 responses. Four items addressing behavioral risk factors were retained as single item variables, (i.e., tobacco control, healthy eating, physical activity, stress)
<i>Population needs assessment:</i> How would you rate your organization's skill level for the following needs assessment activities: (i) Assessing the burden of disease in your organization's target population(s); (ii) Assessing prevalence of risk factors in your organization's target population(s); (iii) Identifying community, cultural, and organizational factors that influence CDP/HLP activities?	1. Poor 2. Fair 3. Moderate 4. Good 5. Excellent	Three of the nine items designed to measure needs assessment activities loaded onto this factor. Each item scored 1 to 5. The factor-based score for this scale was the mean of all 3 responses.
<i>Identify relevant practices:</i> How would you rate your organization's skill level for the following needs assessment activities: (i) Reviewing CDP/HLP activities of other organizations to find gaps in programming for your target population(s); (ii) Reviewing CDP/HLP activities developed by other organizations to see if they can be used by your organization; (iii) Finding relevant best practices in CDP/HLP to see if	1. Poor 2. Fair 3. Moderate 4. Good 5. Excellent	Six of the nine items designed to measure needs assessment activities loaded onto this factor. Each item scored 1 to 5. The factor-based score for this scale was the mean of all 6 responses.

Variable questionnaire item(s)	Response categories	Scoring
they can be used by your organization; (iv) Reviewing research to help develop CDP/HLP priorities; (v) Assessing organization's strengths and limitations and limitations in CDP/HLP; (vi) Consulting with community members to identify priorities for CDP/HLP?		
<i>Planning:</i> How would you rate your organization's skill level for the following planning activities? (i) Using theoretical frameworks to guide development of CDP/HLP activities; (ii) Setting goals and objectives for CDP/HLP; (iii) Reviewing your resources to assess feasibility of CDP/HLP activities; (iv) Developing action plans for CDP/HLP; (v) Designing, monitoring and evaluation of CDP/HLP	1. Poor 2. Fair 3. Moderate 4. Good 5. Excellent	All five items designed to measure skill at planning activities loaded onto this factor. Each item scored 1 to 5. The factor-based score for this scale was the mean of all 5 responses
<i>Implementation strategies:</i> How would you rate your organization's skill level for the following planning activities? (i) group development; (ii) public awareness and education; (iii) skill building at the individual level; (iv) partnership building; (v) community mobilization; (vi) facilitation of self-help groups; (vii) service provider skill building	1. Poor 2. Fair 3. Moderate 4. Good 5. Excellent	Seven of the 11 items designed to measure skill for strategies to implement CDP/HLP loaded onto this factor. Each item scored 1 to 5. The factor-based score for this scale was the mean of all 7 responses. Four items that did not load were excluded, (i.e. advocacy, healthy public policy development, creating healthy environments, volunteer recruitment & development)
<i>Evaluation:</i> How would you rate your organization's skill level for the following evaluation activities? (i) Monitoring CDP/HLP activities; (ii) Measuring achievement of CDP/HLP objectives; (iii) Using quantitative methods to assess impacts of CDP/HLP; (iv) Using qualitative methods to assess impacts of CDP/HLP; (v) Undertaking long term follow-up with the target population for CDP/HLP; (vi) Identifying best practices for CDP/HLP.	1. Poor 2. Fair 3. Moderate 4. Good 5. Excellent	All six items designed to measure skill at evaluation activities loaded onto this factor. Each item scored 1 to 5. The factor-based score for this scale was the mean of all 6 responses
Resources		
<i>Adequacy:</i> How adequate are the following in your organization? (i) Funding levels for CDP/HLP activities; (ii) Funding levels for monitoring and evaluation of CDP/HLP activities; (iii) Access to material resources for CDP/HLP activities.	1. Much less than adequate 2. Less than adequate 3. Neutral 4. Adequate 5. More than adequate	Three of the four items designed to measure adequacy of funding loaded onto this factor. Each item scored 1 to 5. The factor-based score for this scale was the mean of all 3 responses.

Variable questionnaire item(s)	Response categories	Scoring
<i>No. of external sources of resources:</i> Has your organization received external funding from any of the following: (i) research funding organizations such as CIHR; (ii) Health Canada; (iii) Other federal ministry; (iv) Ministry/Dept of Health (provincial); (v) Other provincial ministry; (vi) National NGO; (vii) Provincial NGO; (viii) Municipality; (ix) Major public charity; (x) private foundation; (xi) private funding (e.g. industry); (xii) fund raising; (xiii) other	Yes/No	Positive responses summed; median calculated.
<i>Level of priority for CDP:</i> What is the current level of priority of CDP/HLP (in terms of human and financial resource allocation) in your organization?	1. Very low priority 2. Low priority 3. Moderate 4. High priority 5. Very high priority	Originally this item loaded onto the adequacy of funding factor but upon its removal the alpha for the scale comprising the three remaining items as well as their factor loadings improved. Decision to leave this as a single item. Score assigned to each response category as coded
<i>Stability of resources:</i> In your organization id funding for CDP/HLP...(i) Secure indefinitely; (ii) Determined year by year; (iii) Time limited, project or contract based (i.e., soft funding); (iv) No funding for CDP/HLP.	Yes/No	The following algorithm was used to create scores for low, moderate and high stability. If u19_1=Yes and u19_2 and u19_3= No then Stability = High; if u19_1=No and (u19_2 and u19_3= Yes) or u19_4=Yes then Stability = Low; else stability = Moderate
OUTCOMES		
Level of involvement		
<i>SDOH:</i> How would you rate your organization's level of involvement in CDP activities that address the following factors: (i) social support; (ii) self-esteem; (iii) socio-economic status; (iv) work conditions; (v) social exclusion; (vi) income inequality?	1. Very low 2. Low 3. Moderate 4. High 5. Very high	Ten items were entered into PCA to measure level of involvement in physical risk factor and SDOH programming. Six of 10 items loaded onto one factor. Each item scored 1 to 5. The factor-based score for this scale was the mean of all 6 responses. Four items addressing behavioral risk factors were retained as single item variables, (i.e., tobacco control, healthy eating, physical activity, stress)

Variable questionnaire item(s)	Response categories	Scoring
<i>Population needs assessment:</i> How would you rate your organization's level of involvement in the following needs assessment activities: (i) Assessing the burden of disease in your organization's target population(s); (ii) Assessing prevalence of risk factors in your organization's target population(s); (iii) Identifying community, cultural, and organizational factors that influence CDP/HLP activities?	1. Very low 2. Low 3. Moderate 4. High 5. Very high	Three of the nine items designed to measure needs assessment activities loaded onto this factor. Each item scored 1 to 5. The factor-based score for this scale was the mean of all 3 responses.
<i>Identify relevant practices:</i> How would you rate your organization's level of involvement in the following needs assessment activities: (i) Reviewing CDP/HLP activities of other organizations to find gaps in programming for your target population(s); (ii) Reviewing CDP/HLP activities developed by other organizations to see if they can be used by your organization; (iii) Finding relevant best practices in CDP/HLP to see if they can be used by your organization; (iv) Reviewing research to help develop CDP/HLP priorities; (v) Assessing organization's strengths and limitations and limitations in CDP/HLP; (vi) Consulting with community members to identify priorities for CDP/HLP?	1. Very low 2. Low 3. Moderate 4. High 5. Very high	Six of the nine items designed to measure needs assessment activities loaded onto this factor. Each item scored 1 to 5. The factor-based score for this scale was the mean of all 6 responses
<i>Planning:</i> How would you rate your organization's level of involvement in the following planning activities? (i) Using theoretical frameworks to guide development of CDP/HLP activities; (ii) Setting goals and objectives for CDP/HLP; (iii) Reviewing your resources to assess feasibility of CDP/HLP activities; (iv) Developing action plans for CDP/HLP; (v) Designing, monitoring and evaluation of CDP/HLP	1. Very low 2. Low 3. Moderate 4. High 5. Very high	All five items designed to measure skill at planning activities loaded onto this factor. Each item scored 1 to 5. The factor-based score for this scale was the mean of all 5 responses
<i>Evaluation:</i> How would you rate your organization's level of involvement in the following evaluation activities? (i) Monitoring CDP/HLP activities; (ii) Measuring achievement of CDP/HLP objectives; (iii) Using quantitative methods to assess impacts of CDP/HLP; (iv) Using qualitative methods to assess impacts of CDP/HLP; (v) Undertaking long term follow-up with the target population for CDP/HLP; (vi) Identifying best practices for CDP/HLP.	1. Very low 2. Low 3. Moderate 4. High 5. Very high	All six items designed to measure skill at evaluation activities loaded onto this factor. Each item scored 1 to 5. The factor-based score for this scale was the mean of all 6 responses

Variable questionnaire item(s)	Response categories	Scoring
<p>Intensity of involvement – multiple settings</p> <p>How would you rate your organization's level of involvement in :</p> <p><i>Tobacco control</i> activities in the following settings? (i.e., schools, workplaces, health care settings, community-at-large)</p> <p><i>Physical activity</i> activities in the following settings? (i.e., schools, workplaces, health care settings, community-at-large)</p> <p><i>Healthy eating</i> activities in the following settings? (i.e., schools, workplaces, health care settings, community-at-large)</p> <p><i>Multi-risk factor</i> activities in the following settings? (i.e., schools, workplaces, health care settings, community-at-large)</p>	<p>1. Very low 2. Low 3. Moderate 4. High 5. Very high</p>	<p><i>Intensity of involvement across multiple settings</i> was measured for each individual behavioural risk factor as well as for multi-risk factor activities involving a combination of individual behavioural risk factors. Item responses to involvement levels in four settings were summed and for each organization ranged from 4 to 20. Totals were recoded to range from 1 to 5 with 1=least intensely involved (sum 4-7); 2=less intensely involved (sum 8-10); 3=moderately involved (sum 11-12); 4=highly involved (sum 14-16); 5=very highly involved (sum 17-20).</p> <p>For intensity of involvement across multiple settings (all risk factors): 16 responses were summed creating a range from 16 to 80. This variable was scored 1 to 5 based on quintiles of the cumulative frequency.</p>
<p>Intensity of involvement – multiple strategies</p> <p>How would you rate your organizations level of involvement in:</p> <p><i>Tobacco control</i> activities using the following strategies? (i.e., 1) group development; 2) public awareness & education; 3) skill building at individual level; 4) healthy public policy development; 5) advocacy; 6) partnership building; 7) community mobilization; 8) facilitation of self-help groups; 9) service provider skill building; 10) creating healthy environments; 11) volunteer recruitment & development)</p>	<p>1. Very low 2. Low 3. Moderate 4. High 5. Very high</p>	<p><i>Intensity of involvement using multiple strategies</i> was measured for each individual behavioural risk factor as well as for multi-risk factor activities involving a combination of individual behavioural risk factors. Item responses to involvement levels using each of these 11 strategies were summed and for each organization ranged from 11 to 55. These totals were recoded to range from 1 to 5 with 1=least intensely involved (sum 11-20); 2=less intensely involved (sum 21-28);</p>

Variable questionnaire item(s)	Response categories	Scoring
<p><i>Physical activity</i> activities using the following strategies? (i.e., 1) group development; 2) public awareness & education; 3) skill building at individual level; 4) healthy public policy development; 5) advocacy; 6) partnership building; 7) community mobilization; 8) facilitation of self-help groups; 9) service provider skill building; 10) creating healthy environments; 11) volunteer recruitment & development)</p> <p><i>Healthy eating</i> activities using the following strategies? (i.e., 1) group development; 2) public awareness & education; 3) skill building at individual level; 4) healthy public policy development; 5) advocacy; 6) partnership building; 7) community mobilization; 8) facilitation of self-help groups; 9) service provider skill building; 10) creating healthy environments; 11) volunteer recruitment & development)</p> <p><i>Multi-risk factor</i> activities using the following strategies? (i.e., 1) group development; 2) public awareness & education; 3) skill building at individual level; 4) healthy public policy development; 5) advocacy; 6) partnership building; 7) community mobilization; 8) facilitation of self-help groups; 9) service provider skill building; 10) creating healthy environments; 11) volunteer recruitment & development)</p>		<p>3=moderately involved (sum 29-36); 4=highly involved (sum 37-44); 5=very highly involved (sum 45-55).</p> <p>For intensity of involvement using multiple strategies (all risk factors): 44 responses were summed and ranged from 44 to 220. This variable was scored 1 to 5 based on quintiles of the cumulative frequency.</p>

APPENDIX 7

Organizational Capacity Study questionnaire items and corresponding factor loadings following varimax rotation

No	Item*	No. Components				Cumulative proportion variance explained
		1	2	3	4	
Determinants						
	PCA 1: Organizational Supports	Managerial	Staff	Evaluation		0.51
16_1	Staff have timely access to information they need about CDP	0.28	0.57	0.18		
16_2	Decisions about CDP activities are made in a timely fashion	0.61	0.17	0.21		
16_3	Staff are routinely involved in management's decisions about CDP programming	0.49	0.36	0.38		
16_4	Internal communication about CDP is effective	0.52	0.24	0.26		
16_5	External communication about CDP is effective [†]	0.28	0.13	0.61		
16_6	CDP activities are coordinated with the other activities of the entire organization [†]	0.41	0.11	0.15		
16_7	Innovation in CDP is encouraged	0.58	0.26	0.21		
16_8	Learning is considered an important objective in day-to-day work on CDP [†]	0.46	0.45	0.24		
17_1	Everyone is encouraged to show leadership for CDP within their jobs	0.74	0.06	0.21		
17_2	Staff take leadership roles for CDP activities	0.63	0.21	0.31		
17_3	Managers are accessible regarding CDP activities	0.80	0.15	0.07		
17_4	Managers are responsive to CDP issues	0.79	0.05	0.10		

No	Item*	No. Components				Cumulative proportion variance explained
		1	2	3	4	
17_5	Managers are receptive to new ideas for CDP	0.82	-0.01	0.02		
18_1	Staffing levels are adequate to carry out CDP activities	0.16	0.66	-0.06		
18_2	Staff are hired specifically to conduct CDP activities	0.07	0.44	0.34		
18_3	There is an appropriate level of administrative support for CDP	0.12	0.66	0.00		
18_4	There are professional development opportunities to learn about CDP	0.05	0.73	0.20		
18_5	Staff participate in CDP professional development opportunities	0.08	0.69	0.22		
32_1	There are written monitoring and evaluation policy for CDP	0.13	0.15	0.65		
32_2	Monitoring and evaluation information about your CDP activities is available	0.17	0.13	0.83		
32_3	Lessons learned from monitoring and evaluation of CDP activities are used to make changes	0.28	0.09	0.82		
	<i>PCA 2: Partnerships</i>	Partnership effectiveness				0.50
24_1	Current levels of partnering with other organizations are adequate for effective CDP	0.74				
24_2	Partnerships with other organizations are bringing new ideas about CDP to your	0.79				

No	Item*	No. Components				Cumulative proportion variance explained
		1	2	3	4	
	organization					
24_3	Partnerships with other organizations are bringing resources for CDP to your organization	0.69				
24_4	Your organization's level of participation in coalitions and networks is adequate for effective CDP	0.69				
24_5	The number of organizations that you are connected to through networks concerned with CDP has increased in the last 3 years	0.63				
Organizational Capacity						
	<i>PCA 3: Skills for behavioural risk factors and social determinants of health (SDOH) programming</i>	SDOH	Not retained ^I	Not retained ^{II}		0.44
27_1	Tobacco control ^s	0.07	0.04	0.94		
27_2	Healthy eating ^s	0.09	0.90	0.04		
27_3	Physical activity ^s	0.16	0.84	0.02		
27_4	Social support	0.69	0.17	-0.04		
27_5	Stress ^s	0.50	0.58	0.05		
27_6	Self-esteem	0.70	0.32	-0.20		
27_7	Socio-economic status	0.80	0.16	0.15		
27_8	Work environment	0.58	0.18	0.31		
27_9	Social exclusion	0.85	0.10	-0.04		
27_10	Income inequality	0.84	0.05	0.26		

No	Item*	No. Components				Cumulative proportion variance explained
		1	2	3	4	
	<i>PCA 4: Skills for needs assessment activities</i>	Population needs assessment	Identifying relevant practices			0.63
28_1	Assessing the burden of disease in your organization's target population(s)	0.89	0.12			
28_2	Assessing prevalence of risk factors in your organization's target population(s)	0.90	0.10			
28_3	Identifying community, cultural, and organizational factors that influence CDP activities	0.68	0.31			
28_4	Reviewing CDP activities of other organizations to fund gaps in programming for your target population(s)	0.18	0.79			
28_5	Reviewing CDP activities developed by other organizations to see if they can be used by your organization	0.09	0.82			
28_6	Finding relevant best practices in CDP to see if they can be used by your organization	0.14	0.81			
28_7	Reviewing research to help develop CDP priorities	0.26	0.68			
28_8	Assessing the organization's strengths and limitations in CDP	0.35	0.62			
28_9	Consulting with community members to identify priorities for CDP	0.07	0.68			

No	Item *	No. Components				Cumulative proportion variance explained
		1	2	3	4	
		Planning				0.69
30_1	<i>PCA 5: Skills for planning activities</i>					
	Using theoretical frameworks to guide development of CDP activities	0.78				
30_2	Setting goals and objectives for CDP	0.86				
30_3	Reviewing your resources to assess feasibility of CDP activities	0.84				
30_4	Developing action plans for CDP	0.88				
30_5	Designing, monitoring and evaluation of CDP	0.77				
	<i>PCA 6: Skills for strategies to implement CDP</i>	Implement- tation strategies	Not retained			0.43
31_1	Group development	0.73	0.14			
31_2	Public awareness and education	0.68	0.25			
31_3	Skill building at the individual level	0.72	0.14			
31_4	Healthy public policy development	0.23	0.80			
31_5	Advocacy	0.14	0.85			
31_6	Partnership building	0.54	0.38			
31_7	Community mobilization	0.67	0.33			
31_8	Facilitation of self-help groups	0.53	0.25			
31_9	Service provider skill building	0.74	0.04			
31_10	Creating healthy environments [†]	0.62	0.42			
31_11	Volunteer recruitment & development [†]	0.18	0.61			

No	Item*	No. Components				Cumulative proportion variance explained
		1	2	3	4	
	<i>PCA 7: Skills for evaluation activities</i>	Evaluation				0.64
33_1	Monitoring of CDP activities	0.83				
33_2	Measuring achievement of CDP objectives	0.89				
33_3	Using quantitative methods to assess impacts of CDP	0.83				
33_4	Using qualitative methods to assess impacts of CDP	0.83				
33_5	Undertaking long term follow-up with the target population for CDP	0.73				
33_6	Identifying best practices for CDP	0.69				
	<i>PCA 8: Resources</i>	Resource adequacy				0.69
23_1	Funding levels for CDP activities	0.88				
23_2	Funding levels for monitoring and evaluation of CDP activities	0.86				
23_3	Access to material resources for CDP activities	0.74				
Outcomes						
	<i>PCA 9: Involvement in behavioural risk factors and social determinants of health (SDOH) programming</i>	SDOH	Not retained	Not retained		0.40
27_1	Tobacco control ^s	0.04	-0.03	0.90		
27_2	Healthy eating ^s	0.08	0.89	0.00		
27_3	Physical activity ^s	0.15	0.87	-0.02		

No	Item*	No. Components				Cumulative proportion variance explained
		1	2	3	4	
27_4	Social support	0.71	0.02	-0.17		
27_5	Stress ^s	0.62	0.32	-0.13		
27_6	Self-esteem	0.72	0.21	-0.30		
27_7	Socio-economic status	0.80	0.08	0.16		
27_8	Work environment	0.63	0.12	0.30		
27_9	Social exclusion	0.79	0.08	0.05		
27_10	Income inequality	0.77	0.03	0.29		
	<i>PCA 10: Involvement in needs assessment activities</i>	Population needs assessment	Identifying relevant practices			0.63
28_1	Assessing the burden of disease in your organization's target population(s)	0.88	0.09			
28_2	Assessing prevalence of risk factors in your organization's target population(s)	0.89	0.14			
28_3	Identifying community, cultural, and organizational factors that influence CDP activities	0.72	0.23			
28_4	Reviewing CDP activities of other organizations to fund gaps in programming for your target population(s)	0.08	0.79			
28_5	Reviewing CDP activities developed by other organizations to see if they can be used by your organization	0.01	0.84			
28_6	Finding relevant best practices in CDP to see if	0.10	0.85			

No	Item*	No. Components				Cumulative proportion variance explained
		1	2	3	4	
	they can be used by your organization					
28_7	Reviewing research to help develop CDP priorities	0.20	0.70			
28_8	Assessing the organization's strengths and limitations in CDP	0.27	0.63			
28_9	Consulting with community members to identify priorities for CDP	0.26	0.57			
	<i>PCA 11: Involvement in planning activities</i>	Planning				0.65
30_1	Using theoretical frameworks to guide development of CDP activities	0.71				
30_2	Setting goals and objectives for CDP	0.87				
30_3	Reviewing your resources to assess feasibility of CDP activities	0.84				
30_4	Developing action plans for CDP	0.88				
30_5	Designing, monitoring and evaluation of CDP	0.71				
	<i>PCA 12: Involvement in evaluation activities</i>	Evaluation				0.60
33_1	Monitoring of CDP activities	0.83				
33_2	Measuring achievement of CDP objectives	0.87				
33_3	Using quantitative methods to assess impacts of CDP	0.79				
33_4	Using qualitative methods to assess impacts of CDP	0.83				
33_5	Undertaking long term follow-up with the target	0.64				

No	Item*	No. Components				Cumulative proportion variance explained
		1	2	3	4	
	population for CDP					
33_6	Identifying best practices for CDP	0.67				
Facilitators						
	<i>PCA 13: Facilitators</i>	Internal	Resources	Government priority	Public priority	0.51
57_1	Level of board support	0.45	-0.14	0.06	0.19	
57_2	Commitment to CDP by senior management	0.52	-0.10	0.02	0.05	
57_3	Funding for CDP activities [†]	0.63	0.02	0.52	0.04	
57_4	Number of paid staff working on CDP [†]	0.67	-0.01	0.41	0.12	
57_5	Financial support for CDP professional development [†]	0.65	0.11	0.41	-0.11	
57_6	Organizational structure for CDP	0.74	0.12	-0.03	0.06	
57_7	Staff experience with CDP	0.61	0.25	-0.11	0.14	
57_8	Internal coordination of CDP activities	0.64	0.26	-0.26	0.20	
57_9	Level of target population interest in CDP	0.10	-0.04	-0.01	0.74	
57_10	Level of public understanding of CDP	0.08	0.01	0.11	0.77	
57_11	Availability of CDP research	0.16	0.33	0.10	0.46	
57_12	Availability of CDP data about your specific target population(s)	0.11	0.09	0.30	0.50	
57_13	Level of provincial priority for CDP	0.07	0.33	0.74	0.20	
57_14	Level of national priority for CDP	-0.11	0.35	0.64	0.30	
57_15	Access to provincial resources for CDP	0.18	0.67	0.31	0.07	
57_16	Usefulness of the provincial resource organizations for CDP	0.12	0.79	0.22	-0.01	

No	Item*	No. Components				Cumulative proportion variance explained
		1	2	3	4	
57_17	Access to related national resource organizations for CDP	-0.07	0.77	0.11	0.13	
57_18	Usefulness of the national resource organizations for CDP	0.00	0.77	0.12	0.09	
57_19	Level of provincial/ministry support for CDP capacity building	0.16	0.37	0.58	0.15	
57_20	Level of support for CDP from partners	0.28	0.22	0.21	0.42	
57_21	Number of volunteers for CDP [†]	0.42	0.24	-0.32	0.35	
57_22	Access to media for coverage of CDP	0.13	0.16	0.13	0.52	
57_23	Health system reform	0.06	0.23	0.50	0.19	
57_24	Characteristics of your target population or territory [†]	-0.16	-0.12	0.37	0.40	

* Items with factor loadings ≥ 0.35 were retained and appear bolded

[†] Item dropped; loaded on to more than one component

[‡] Item dropped; did not share same conceptual meaning as other items in the component

[§] Item retained as an individual variable

|| Component not retained; following decisions re: individual items, component did not meet criterion that factors comprise \geq three items

[¶] Component not retained; variables that did load did not share the same conceptual meaning

APPENDIX 8

Canadian Heart Health Dissemination Project

Resource Organization Questionnaire

INTERVIEWER VERSION

ID#: _____

Date of Interview: _____ - _____ - _____ Local Time
(LT): _____

Interviewer: _____

EST Start (1): _____ EST Finish (2): _____

Length Time (2) – (1) = _____ minutes

✂ _____ ✂ _____ ✂ _____

Name of Respondent

Organization

Address

Telephone Number: (____) _____

Responses need to reflect current situation, not what they would like to see happening.

Organization Characteristics

In this section we are asking questions about the characteristics of your organization. You may be responding on behalf of an entire resource organization (if the organization as a whole conducts activities pertaining to chronic disease prevention/healthy lifestyle promotion (CDP/HLP) **OR** on behalf of a specific division, department, or unit within an organization (if only this level conducts activities pertaining to CDP/HLP).

Please note that when the term 'organization' appears in a question as:

organization – it refers to your entire organization

(organization) – it refers to whichever level you represent, i.e. your division, department or unit **OR** your entire organization

1. **How long has your organization been in operation, regardless of all its evolutions?**

_____ months, if less than 1 year **OR** _____ years

2. **Which of the following best describes your organization? Choose one response only.**

- ☐ 1 Federal or Provincial Government
- ☒ 2 Regional Health Authority
- ☐ 3 Public Health Dept/Agency
- ☒ 4 Para-governmental Health Agency
- ☐ 5 Non-governmental, Not-for-profit organization
- ☒ 6 Professional Association
- ☐ 7 Research Centre
- ☒ 8 Resource Centre
- ☐ 9 Coalition, partnership, alliance or consortium
- ☒ 10 Other (specify): _____

3. **Excluding consultants and short term contractual employees, how many FTEs (Full Time Equivalents) work in your organization?**

_____ FTEs

☐ 7 Don't know

Responses need to reflect current situation, not what they would like to see happening.

4. **Excluding consultants and short term contractual employees, how many FTEs (Full Time Equivalents) work in your (organization)?**

_____ FTEs

☐₈ Not applicable (responding with reference to the entire organization)

☐₇ Don't know

5. **On average, how many volunteers (including Board members) work for your organization each year? Do not include students and interns.**

_____ None → Go to Question 7

_____ Volunteers on average per year

☐₇ Don't know

National NGOs: # for head office activities only.
Provincial NGOs: # for provincial and regional branch activities *only* if we are not contacting the regions individually

6. **How many volunteers does your organization have in total, at the time of the year when there are the most volunteers? Do not include students and interns**

_____ Volunteers at maximum number

☐₇ Don't know

☐₈ Not applicable (the number of volunteers does not fluctuate substantially)

National NGOs: # for head office activities only.
Provincial NGOs: # for provincial and regional branch activities *only* if we are not contacting the regions individually

7. **What geographical area does your organization serve? Choose one response only.**

☐₁ Region

☒₂ Province

☐₃ Multi-province/territory

☒₄ Canada

Responses need to reflect current situation, not what they would like to see happening.

8. In the past 3 years has your (organization) transferred CDP/HLP innovations to any of the following types of organizations?

	Yes	No
Regional Health Authorities	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Public Health Units/Agencies	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Community Health Centres/Centres Locaux de Santé Communautaire (CLSCs)	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Non Governmental Organizations (NGOs)	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Government Departments	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
School boards	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Health Profession Associations	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Regional Chapters/Branches of your organization	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Community groups	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Other health organizations (specify) _____	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Other organizations (specify): _____	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁

Responses need to reflect current situation, not what they would like to see happening.

Transfer Practices

We are interested in CDP/HLP innovations that your (organization) has transferred in the last 3 years:

- ❖ These innovations can be completely new or newly adapted versions of existing CDP/HLP innovations.
- ❖ They should focus on primary prevention
- ❖ They should be developed with the intent to transfer them to user organizations that work with large groups or populations across the life span.
- ❖ These innovations may have concrete aims (e.g. to reduce risk behaviours in a certain population) or the aims may be more abstract (e.g. to transmit chronic disease prevention strategies such as a population approach, community development to user organizations)
- ❖ The transfer of these innovations must be complete or have reached an advanced stage allowing you to reflect on the experience.

9. **Please list the innovation(s) that your (organization) has transferred in the last 3 years along with the corresponding aim. Examples are provided in the boxes below.**

Examples: Innovation Aims <ul style="list-style-type: none"> Changing public policy Creating supportive environments Strengthening community action Skill building Capacity building Risk reduction Knowledge transfer Re-orienting health services towards health promotion Etc. 	Operationalization → ← Innovation Aim	Examples: Innovations <ul style="list-style-type: none"> Training program Training material Kit Resource Practice tool Practice guidelines Campaign Pamphlet Public Policy Intervention School-based program Etc.
Innovation Aims <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>		Innovations <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>

Responses need to reflect current situation, not what they would like to see happening.

10. Of the innovations that you have identified, which one is the *most recent in terms of transfer* ? _____.

Unless otherwise specified, please answer the remaining questions with reference to this **most recent, completely transferred innovation**.

11. Did you transfer _____ to any of the following types of user organizations?

	Yes	No		How many user organizations?	What proportion of the total (%)?
Regional Health Authorities	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁	→	<input type="text"/>	<input type="text"/>
Public Health Units / Agencies	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁	→	<input type="text"/>	<input type="text"/>
Community Health Centres	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁	→	<input type="text"/>	<input type="text"/>
CLSCs (Quebec only)	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁	→	<input type="text"/>	<input type="text"/>
Non Governmental Organizations	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁	→	<input type="text"/>	<input type="text"/>
Government Departments	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁	→	<input type="text"/>	<input type="text"/>
School Boards	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁	→	<input type="text"/>	<input type="text"/>
Health Professional Associations	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁	→	<input type="text"/>	<input type="text"/>
Regional Chapters/Branches of your organization	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁	→	<input type="text"/>	<input type="text"/>
Community groups	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁	→	<input type="text"/>	<input type="text"/>
Other health organizations (specify): _____	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁	→	<input type="text"/>	<input type="text"/>
Other organizations (specify): _____	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁	→	<input type="text"/>	<input type="text"/>
TOTAL				<input type="text"/>	<input type="text"/>

Complete, only if exact breakdown is not provided.

Responses need to reflect current situation, not what they would like to see happening.

12. How many professional FTEs (Full Time Equivalents), including consultants and contractual workers, worked on _____?

_____ FTEs

Excluding secretaries.

13. How many of these FTEs were paid by your (organization)?

_____ FTEs

14. On a scale of 1 (never involved) to 5 (extensively involved), how involved was/were the user organization(s) in identifying the need for _____?

	NEVER INVOLVED				EXTENSIVELY INVOLVED
Level of involvement of user organizations in identifying the need for _____	1	2	3	4	5

Responses need to reflect current situation, not what they would like to see happening.

15. Did your (organization) use any of the following methods to identify the need for _____?

	Yes	No
Needs survey of potential user organization(s)	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Focus group(s) (animated by a professional) with members of the user organization(s)	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Meetings between your (organization) and user organization(s)	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Informal networking/communication with colleagues	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Formal review of the research literature	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Professional experience working in the field	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Inventory of current resources, programs, and initiatives to determine needs/gaps	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Inventory of current resources, programs, and initiatives to determine assets/capacities	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Other (specify): _____	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁

In several of the following questions, we will be asking you to generalize your responses over all _____ (insert total number) user organizations identified in Q11.

Responses need to reflect current situation, not what they would like to see happening.

16. During the development and transfer of _____ did your (organization) interact with the _____ (insert number) user organization(s) in any of the following ways? If so, at which phase(s)? Please generalize your responses over all user organization(s).

		Development Phase			Transfer Phase		
		At identification of need	During conceptualization of the innovation	During innovation development	When transfer strategies were being planned	At the time of transfer	At the time of evaluation of transfer
A committee made up of members from each organization	No						
	Yes						
	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
An intermediary or specific individual whose role it was to facilitate exchange between your organization and the user organization(s)	No						
	Yes						
	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
An identified primary contact within the user organization to facilitate communication as a user point person	No						
	Yes						
	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Informal personal contacts between individual members from your organization and the user organization	No						
	Yes						
	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (specify) _____ _____ _____ _____ _____	No						
	Yes						
	<input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Responses need to reflect current situation, not what they would like to see happening.

17. In what month and year did your (organization) begin developing _____?

____ / ____
Month Year

Must provide a month.

18. In what month and year was development of _____ complete?

____ / ____
Month Year

Must provide a month.

19. On average, how many times per month did your (organization) communicate with each of the _____ (insert number) user organization(s) during development of _____? Please generalize your responses over all user organizations.

- ☐₁ Less than 1-2 times / month
☐₂ 1-2 times / month
☐₃ 3-4 times / month
☐₄ 5-6 times / month
☐₅ 7-10 times / month
☐₆ More than 10 times / month

☐₇ Don't know

20. During which phase of development of _____ did your (organization) communicate most often with the user organization(s)?

- ☐₁ Identification of need
☐₂ Conceptualization of the innovation
☐₃ Development of the innovation

☐₈ Not applicable, frequency of communication did not vary across phases

21. Did the number of communications vary across user organizations during the development phase?

- ☐₂ Yes
☐₁ No

Clarify: "Did you communicate with some user organizations more than others during the development phase?"

☐₈ Not applicable, transferred to only one user organization

22. In what month and year did your (organization) begin planning the transfer of _____ to the user organization(s)?

____ / ____
Month Year

Must provide a month.

Responses need to reflect current situation, not what they would like to see happening.

23. Is the transfer ongoing?

- ☐₂ Yes —————→ Go to question 25
☐₁ No

24. In what month and year did your (organization) stop working on the transfer of _____ ?

____ / ____
Month Year

Must provide a month.

25. On average, how many times per month did your (organization) communicate with each of the ____ (insert number) user organization(s) during the transfer of _____ ? Please generalize your responses over all user organizations.

- ☐₁ Less than 1-2 times / month
☒₂ 1-2 times / month
☐₃ 3-4 times / month
☒₄ 5-6 times / month
☐₅ 7-10 times / month
☒₆ More than 10 times / month

☐₇ Don't know

26. During which phase of the transfer of _____ did your (organization) communicate most often with the user organization(s)?

- ☐₁ Planning transfer strategies
☒₂ Time of transfer
☐₃ Evaluation of the transfer

☐₈ Not applicable, frequency of communications did not vary according to the phase

27. Did the number of communications vary across user organizations during the transfer phase?

- ☐₂ Yes
☐₁ No

☐₈ Not applicable, transferred to only one user organization

Clarify: "Did you communicate with some user organizations more than others during the transfer phase?"

Responses need to reflect current situation, not what they would like to see happening.

28. On a scale of 1 (strongly disagree) to 5 (strongly agree), indicate your level of agreement with the following statement:

	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
Efforts were made by your (organization) to identify key people in the user organization(s) who could facilitate the transfer of _____.	1	2	3	4	5

Questions 29 and 30 ask about barriers and facilitators within the user organization(s) that could affect implementation or delivery of CDP/HLP innovations.

29. On a scale of 1 (not at all) to 5 (completely), to what extent does your (organization) understand . . .

	NOT AT ALL				COMPLETELY
barriers within the ____ (insert number) user organization(s) that could affect implementation or delivery of _____ by the user organization(s)?	1	2	3	4	5
facilitators within the ____ (insert number) user organization(s) that could help with implementation or delivery of _____ by the user organization(s)?	1	2	3	4	5

Responses need to reflect current situation, not what they would like to see happening.

30. Did your (organization) use any of the following methods to understand barriers and/or facilitators within the ____ (insert number) user organization(s) that could affect implementation or delivery of _____ :

	Yes	No
Focus groups	<input type="checkbox"/> 2	<input type="checkbox"/> 1
Meetings or small group discussions	<input type="checkbox"/> 2	<input type="checkbox"/> 1
Interviews with opinion leaders or senior management	<input type="checkbox"/> 2	<input type="checkbox"/> 1
Questionnaires/surveys	<input type="checkbox"/> 2	<input type="checkbox"/> 1
Informal or ad hoc phone/email contact with front line or team leaders	<input type="checkbox"/> 2	<input type="checkbox"/> 1
Prior experience working together	<input type="checkbox"/> 2	<input type="checkbox"/> 1
Other (specify): _____	<input type="checkbox"/> 2	<input type="checkbox"/> 1

Responses need to reflect current situation, not what they would like to see happening.

31. In transferring _____ to the ____ (*insert number*) user organization(s) did your (organization) use any of the following strategies?

	Yes	No
Print communication (e.g. Newsletter, journal article, etc.)	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Information technology (e.g. Web site)	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Resource guides/Printed materials (e.g. how-to manuals, kits, etc.)	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Audio-visual presentations	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Face-to-face (interpersonal) contact between your organization and user organization(s)	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Live demonstrations	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Training/Workshops	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
On-site Consultation to user organization(s)	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Consultation to user organization(s) by telephone or teleconference	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Conferences	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Knowledge brokers/Change agents	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Program champion	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Other (specify): _____	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁

Responses need to reflect current situation, not what they would like to see happening.

32. On a scale of 1 (strongly disagree) to 5 (strongly agree), indicate your level of agreement with the following statement:

	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
The strategy(ies) used to transfer _____ to the ____ (insert number) user organization(s) was/were tailored to meet the needs of individual user organization(s)	1	2	3	4	5

33. On a scale of 1 (poor) to 5 (excellent), rate the capacity (i.e. knowledge, skills and (human and financial) resources) of the user organization(s) to implement or deliver _____. Please generalize your responses over all organizations.

	POOR	FAIR	GOOD	VERY GOOD	EXCELLENT
Knowledge	1	2	3	4	5
Skills	1	2	3	4	5
Human Resources	1	2	3	4	5
Financial Resources	1	2	3	4	5

Responses need to reflect current situation, not what they would like to see happening.

34. Did your (organization) use any of the following strategies to build or enhance capacity (i.e., knowledge, skills and (human and financial) resources) in the user organization(s) to assist with implementation or delivery of _____?

	Yes	No
Provided skill-building regarding general prevention/promotion planning, implementation, and evaluation	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Provided relevant background information to the user organization(s) regarding _____	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Provided specific staff training to the user organization(s) regarding _____	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Provided print resource materials to the user organization(s)	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Provided electronic resource materials to the user organization(s)	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Provided technical support to the user organization(s)	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Provided consultation to the user organization(s)	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Provided financial assistance (direct funding) to the user organization(s)	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Organized meetings of user organizations	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Other (specify) _____	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁

35. On a scale of 1 (strongly disagree) to 5 (strongly agree), indicate your level of agreement with the following statements: (Indicate '1' if the statement DOES NOT apply.)

Plans for transfer of _____	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
Included specific operational objectives	1	2	3	4	5
Included a specific timeline with milestones	1	2	3	4	5
Included a detailed budget	1	2	3	4	5
Included allocation of tasks	1	2	3	4	5
Were well documented	1	2	3	4	5

Responses need to reflect current situation, not what they would like to see happening.

36. Would you say the transfer plans for _____ were implemented:

☐₁ with major modifications

☐₂ with minor modifications

☐₃ exactly as planned

☐₈ Not applicable, no transfer plans were designed

37. Did your (organization) do any of the following to evaluate the transfer of _____ to the _____ (insert number) user organization(s)?

	Yes	No
Monitor your organization's transfer activities	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Evaluate implementation or delivery of _____ by user organization(s)	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Long-term follow-up with user organization(s) to monitor if _____ is still being used	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Evaluate attainment of your organization's transfer goals/objectives	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Identify unanticipated effects of the transfer	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Evaluate user organizations' perceptions of _____ (problems, strengths)	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Evaluate effectiveness of the transfer strategies used	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁

Responses need to reflect current situation, not what they would like to see happening.

38. On a scale of 1 (strongly disagree) to 5 (strongly agree), indicate your level of agreement with the following statements:
(Indicate '1' if decisions were NOT made jointly.)

Your (organization) and the user organization(s) made decisions jointly during:	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
Identification of need for _____	1	2	3	4	5
Background research	1	2	3	4	5
Conceptualization of _____	1	2	3	4	5
Development/adaptation of _____	1	2	3	4	5
Development/adaptation of educational materials for _____	1	2	3	4	5
Identification of barriers to implementation of _____	1	2	3	4	5
Identification of facilitators to implementation of _____	1	2	3	4	5
Selection of transfer strategies	1	2	3	4	5
Implementation of transfer strategies	1	2	3	4	5
Evaluation of transfer	1	2	3	4	5
Other (specify) _____	1	2	3	4	5

Responses need to reflect current situation, not what they would like to see happening.

39. On a scale of 1 (strongly disagree) to 5 (strongly agree), indicate your level of agreement with the following statements:

From what you have observed in the past 3 years, your (organization)...	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
Focuses the process of innovation development on user organizations' needs.	1	2	3	4	5
Includes user organizations' ideas in every step of innovation development.	1	2	3	4	5
Focuses the process of innovation transfer on user organizations' needs.	1	2	3	4	5
Includes user organizations' ideas in every step of innovation transfer.	1	2	3	4	5
Limits information it shares with user organizations.	1	2	3	4	5
Prioritizes understanding the needs of user organizations.	1	2	3	4	5
Prioritizes understanding the culture of user organizations.	1	2	3	4	5
Treats user organizations as equal partners during innovation development.	1	2	3	4	5
Treats user organizations as equal partners during innovation transfer.	1	2	3	4	5

Responses need to reflect current situation, not what they would like to see happening.

40. In this question “collaborating” means working jointly to solve problems and make decisions. On a scale of 1 (strongly disagree) to 5 (strongly agree), indicate your level of agreement with the following statements:

From what you have observed in the past 3 years, collaborating with user organizations ...	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
Guarantees that the resulting innovation will be relevant to user organizations.	1	2	3	4	5
Ensures that innovation transfer strategies will be successful.	1	2	3	4	5
Is too difficult a process to carry out routinely.	1	2	3	4	5
Takes too much time.	1	2	3	4	5
Is the only effective way to solve problems in innovation development.	1	2	3	4	5
Is the only effective way to solve problems in innovation transfer.	1	2	3	4	5
Is not worth the investment.	1	2	3	4	5

41. Given unlimited resources, what 3 things would you have done differently in terms of the transfer of _____? Please limit list to one sentence each.

- 1) _____
- 2) _____
- 3) _____

Responses need to reflect current situation, not what they would like to see happening.

Factors Affecting Transfer Practices

- 42. Is there one person within your organization who is formally mandated to be in charge of innovation transfer?**

- ☐₁ Yes
☐₂ No —————→ Go to question 44
☐₇ Don't know —————→ Go to question 44

- 43. What position does this person hold within your organization?**

Position (specify): _____

- 44. On a scale of 1 (not at all) to 5 (completely), to what extent is transfer considered part of the job of those who develop innovations?**

	NOT AT ALL				COMPLETELY
Transfer is considered part of the job of those who develop innovations	1	2	3	4	5

- 45. On a scale of 1 (not at all) to 5 (very actively), how actively are transfer practices championed in your (organization) (over and above anyone formally mandated to be in charge of innovation transfer)?**

	NOT AT ALL				VERY ACTIVELY
Transfer practices are actively championed in your (organization).	1	2	3	4	5

- 46. On a scale of 1 (strongly disagree) to 5 (strongly agree), indicate your level of agreement with the following statement:**

	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
Your (organization) is knowledgeable about how to transfer CDP/HLP innovations to user organizations.	1	2	3	4	5

Responses need to reflect current situation, not what they would like to see happening.

47. Does your (organization) use any of the following to learn about how to transfer CDP/HLP innovations to other organizations?

	Yes	No
Research literature review on transfer practices	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Review of web-based resources	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Discussions with colleagues within your organization about transfer	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Discussions with colleagues outside your organization about transfer	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Participation in partnerships / networks / coalitions	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Seminars	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Conferences	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
List serves	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Other (specify): _____	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁

48. On a scale of 1 (strongly disagree) to 5 (strongly agree), indicate your level of agreement with the following statement:

	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
Your (organization) is skilled (i.e. has expertise) in terms of transferring CDP/HLP innovations to user organizations.	1	2	3	4	5

Responses need to reflect current situation, not what they would like to see happening.

49. On a scale of 1 (strongly disagree) to 5 (strongly agree), indicate your level of agreement with the following statements:

Staff within your (organization) have the skills to:	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
Identify the need for CDP/HLP innovations	1	2	3	4	5
Develop a process for the exchange of knowledge and ideas between your organization and user organizations (i.e. a linking system)	1	2	3	4	5
Collaborate effectively with user organizations	1	2	3	4	5
Identify barriers and facilitators within user organizations related to implementation or delivery of CDP/HLP innovations	1	2	3	4	5
Select appropriate transfer strategies to <i>overcome</i> barriers within user organizations to implementation or delivery of CDP/HLP innovations	1	2	3	4	5
Select appropriate transfer strategies to <i>promote</i> facilitators within user organizations for implementation or delivery of CDP/HLP innovations	1	2	3	4	5
Design transfer plans	1	2	3	4	5
Build capacity within user organizations to facilitate implementation or delivery of CDP/HLP innovations	1	2	3	4	5
Implement transfer plans	1	2	3	4	5
Monitor transfer activities	1	2	3	4	5
Evaluate effectiveness of transfer strategies used	1	2	3	4	5
Evaluate if implementation of CDP/HLP innovations by user organizations took place	1	2	3	4	5

Responses need to reflect current situation, not what they would like to see happening.

50. On a scale of 1 (strongly disagree) to 5 (strongly agree), indicate your level of agreement with the following statement:

	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
Your (organization) supports training or professional development to improve transfer practices.	1	2	3	4	5

51. In the last 3 years how often has staff in your (organization) participated in professional development/training for transfer practices?

- ☐ 1 0 times
☒ 2 1 time
☐ 3 2-3 times
☒ 4 4-5 times
☐ 5 Over 5 times

Go to question 54

52. For the most recent professional development/training, which type of organization provided the content?

- ☐ 1 Federal or Provincial Government
☒ 2 Regional Health Authority
☐ 3 Public Health Dept/Agency
☒ 4 Para-governmental Health Agency
☐ 5 Non-governmental, Not-for-profit organization
☒ 6 Professional Association
☐ 7 Research Centre
☒ 8 Resource Centre
☐ 9 Coalition, Partnership, Alliance or Consortium
☒ 10 University
☐ 11 Private consulting firm
☒ 12 Other (specify): _____

53. On a scale of 1 (strongly disagree) to 5 (strongly agree), indicate your level of agreement with the following statements concerning the professional development / training in Q52:

	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
Professional development/training was sufficient to enable staff in your (organization) to remain well informed about transfer practices.	1	2	3	4	5
The content of the professional development/training was useful to your (organization's) transfer practices.	1	2	3	4	5

Responses need to reflect current situation, not what they would like to see happening.

54. On a scale of 1 (poor) to 5 (excellent), rate your (organization's) performance over the last 3 years on the following activities:

	POOR	FAIR	GOOD	VERY GOOD	EXCEL- LENT
Identifying need for CDP/HLP innovations	1	2	3	4	5
Developing CDP/HLP innovations	1	2	3	4	5
Collaborating with user organizations	1	2	3	4	5
Developing a process for the exchange of knowledge and ideas between your organization and user organizations (i.e. a linking system)	1	2	3	4	5
Identifying barriers within user organizations to implementation or delivery of CDP/HLP innovations	1	2	3	4	5
Identifying facilitators within user organizations for implementation or delivery of CDP/HLP innovations	1	2	3	4	5
Selecting appropriate transfer strategies to overcome barriers and promote facilitators within user organizations to implementation or delivery of CDP/HLP innovations	1	2	3	4	5
Designing transfer plans	1	2	3	4	5
Building user capacity to facilitate implementation of CDP/HLP innovations	1	2	3	4	5
Implementing transfer plans	1	2	3	4	5
Monitoring transfer activities	1	2	3	4	5
Evaluating effectiveness of transfer strategies	1	2	3	4	5
Understanding the context in which CDP/HLP innovations will be implemented or delivered	1	2	3	4	5

Responses need to reflect current situation, not what they would like to see happening.

55. How many FTEs (Full Time Equivalents) are there in your organization with a mandate to work on transfer?

___ FTEs (number)

☐7 Don't know → Go to Question 57

56. This represents how many people? ___ people (number)

57. How many FTEs (Full Time Equivalents) are there in your (organization) with a mandate to work on transfer

___ FTEs (number)

☐8 Not Applicable, responding on behalf of an entire organization → Go to Question 59

58. This represents how many people? ___ people (number)

59. Was there a budget (over and above the budget for staff) allocated specifically for transfer of _____ to the user organization(s)?

☐2 Yes

☐1 No → Go to Question 62

60. Was this budget present at the outset of _____?

☐2 Yes

☐1 No

61. Approximately how much was this budget?

_____ dollars

___ Don't know

62. On a scale of 1 (never) to 5 (very often) how often does your (organization) apply for funds from outside sources that include support specifically allocated for innovation transfer?

	NEVER				VERY OFTEN
Your (organization) applies for funds from outside sources that include support specifically allocated for innovation transfer.	1	2	3	4	5

If response is "Never", Go to question 65

63. On a scale of 1 (never) to 5 (very often) how often does your (organization) acquire funds from outside sources that include support specifically allocated for innovation transfer?

	NEVER				VERY OFTEN
Your (organization) acquires funds from outside sources that include support specifically allocated for innovation transfer.	1	2	3	4	5

64. Has your (organization) obtained the external funding referred to in question 63 from any of the following sources in the past 3 years?

	Yes	No
Research funding organization (e.g. CIHR)	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Health Canada	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Other federal ministry	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Ministry/Department of Health (provincial)	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Other provincial ministry	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
National NGO	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Provincial NGO (including provincial chapter of a national (NGO)	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Major charity (e.g. Trillium Foundation, United Way/Centraide)	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Private funding (e.g. Corporate)	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Fundraising	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Other (specify) _____	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁

65. On a scale of 1 (strongly disagree) to 5 (strongly agree), indicate your level of agreement with the following statements:

In the past 3 years, your (organization) has allocated ...	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
a sufficient number of staff to transfer practices	1	2	3	4	5
appropriately skilled staff to transfer practices	1	2	3	4	5
enough budget for transfer practices.	1	2	3	4	5

Responses need to reflect current situation, not what they would like to see happening.

66. In the past 3 years, how many different innovations has your (organization) transferred related to:

	None	Number
Tobacco control	<input type="checkbox"/>	<input type="text"/>
Healthy nutrition	<input type="checkbox"/>	<input type="text"/>
Physical activity	<input type="checkbox"/>	<input type="text"/>
Healthy lifestyles	<input type="checkbox"/>	<input type="text"/>
Multiple risk behaviours	<input type="checkbox"/>	<input type="text"/>
Other risk factors (specify): _____	<input type="checkbox"/>	<input type="text"/>
Other CDP/HLP related topics (specify): _____	<input type="checkbox"/>	<input type="text"/>

Responses need to reflect current situation, not what they would like to see happening.

67. On a scale of 1 (not at all important) to 5 (very important), how important are each of the following in encouraging staff to engage in transfer practices within your (organization)?

	NOT AT ALL IMPORTANT				VERY IMPORTANT
Being asked to join governmental or other forums	1	2	3	4	5
Professional recognition from <i>outside</i> your organization	1	2	3	4	5
Professional recognition from <i>within</i> your organization	1	2	3	4	5
Satisfaction in seeing an innovation that was developed become implemented	1	2	3	4	5
Organization values this work	1	2	3	4	5
Access to funding	1	2	3	4	5
Feedback from user organization(s)	1	2	3	4	5
Meeting objective(s) of the program	1	2	3	4	5
Other (specify): _____	1	2	3	4	5

68. What percentage of resources (human and financial) was allocated to the transfer of _____ relative to its development?

- ☐₁ 10% transfer 90% development
- ☒₂ 20% transfer 80% development
- ☐₃ 30% transfer 70% development
- ☒₄ 40% transfer 60% development
- ☐₅ 50% transfer 50% development
- ☒₆ 60% transfer 40% development
- ☐₇ 70% transfer 30% development
- ☒₈ 80% transfer 20% development
- ☐₉ 90% transfer 10% development
- ☒₁₀ Don't know

Responses need to reflect current situation, not what they would like to see happening.

69. In the past 3 years did your (organization) transfer any CDP/HLP innovations to ...?

	Yes	No
Local organizations	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Regional organizations	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
Provincial organizations	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
National organizations	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁
International organizations	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁

Follow up Information

We are now planning an add-on study in which user organizations targeted for innovation transfer by resource organizations will be contacted to determine (i) their perceptions of the transfer process and (ii) to follow up on the status of transferred innovations.

70. Can we contact you at a later date about this add-on study?

☐₂ Yes
☐₁ No

—————→ Go to question 72

71. Can you provide the name and contact information of a colleague who is also knowledgeable about your (organization's) transfer practices to act as a possible back up respondent?

☐₂ Yes
☐₁ No

Name of Colleague: _____

Position: _____

Telephone number: (____) _____ - _____ ext. _____

Email address: _____

Responses need to reflect current situation, not what they would like to see happening.

Characteristics of Respondent

To finish off, I'd like to ask a few questions about you.

72. **Sex:** ☐₁ Male
☐₂ Female

73. **In what age category do you belong?**

- ☐₁ 20-29 years
☐₂ 30-39 years
☐₃ 40-49 years
☐₄ 50-59 years
☐₅ 60-69 years
☐₆ 70 + years

74. **What is the highest diploma/degree that you have completed?**

- ☐₁ Diploma
☐₂ Bachelor's
☐₃ Bachelor's + Professional Degree
☐₄ Master's
☐₅ MD
☐₆ PhD
☐₇ Other (specify) _____

75. **Which best describes your current position within your (organization)?**

- ☐₁ President /CEO
☐₂ Director
☐₃ Department Head
☐₄ Manager / Supervisor / Team leader
☐₅ Professional staff (specify) _____
☐₆ Other (specify): _____

76. **How long have you been in your current position?**

_____ Months OR _____ Years

Responses need to reflect current situation, not what they would like to see happening.

77. Is your current position ...

- ☐₁ Full-time
☐₂ Part-time

78. How many years of experience do you have working in CDP/HLP?

_____ years

79. Are you are interested in receiving a summary of the results from this survey?

- ☐₁ No
☐₂ Yes

Fall 2005

80. If yes, please indicate if you would prefer an electronic or hard copy.

- ☐₁ Electronic copy
☐₂ Hard copy

THANK YOU

Responses need to reflect current situation, not what they would like to see happening.

APPENDIX 9

Detailed Description of Variables Pertaining to Dissemination Process in Resource Organizations

Innovation of Dissemination Practice Variable questionnaire item(s)	Response categories	Scoring	Psychometric Properties and/or descriptive statistics (mean , median, inter-quartile range)
Identification of the need for the innovation			
How involved was/were the user organization(s) in identifying the need for [REFERENCE INNOVATION]	1. Never involved 2. 3. 4. 5. Extensively involved	Score assigned to each response category	Mean=3.8 (1.1); median=4; IQR=2
Development of a linkage system			
During the development and transfer of [REFERENCE INNOVATION] did your organization interact with the user organization(s) in the following way? <ul style="list-style-type: none"> Committee made up of members from each organization? An intermediary or specific individual whose role it was to facilitate exchange between your organization and the user organization(s) An identified primary contact within the user organization to facilitate communication as a user point person Informal personal contacts between individual members from your organization and the user organization 	Respondent indicated preliminarily which of the 4 interactions with user organizations were used.	-	-
If so, at which phases? <ul style="list-style-type: none"> At identification of need During conceptualization of innovation During innovation development When transfer strategies were being planned At time of transfer At time of evaluation of transfer 	Yes/no	Positive responses were summed over a possible 24 responses; cumulative frequency was quintiled, then rankings (0 to 4) re-coded to create a score from 1 to 5	Mean=3.0 (1.4); Median=3; IQR=2

Innovation of Dissemination Practice Variable questionnaire item(s)	Response categories	Scoring	Psychometric Properties and/or descriptive statistics (mean , median, inter-quartile range)
Collaboration with user:			
<i>During Development:</i> Indicate your level of agreement that your organization and the user organization(s) made decisions jointly during (i) identification of need for REFERENCE INNOVATION; (ii) background research; (iii) conceptualization of REFERENCE INNOVATION; (iv) development /adaptation of REFERENCE INNOVATION.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	Each item scored 1 to 5. The factor-based score for this scale was the mean of the responses for all 4 items.	Four of 10 items designed to measure collaboration with user that did not load were used to create this factor. Alpha=0.75; Mean inter-item correlation=0.40; range inter-item correlations=0.24-0.58 Mean=3.4 (0.9); Median=4; IQR=1
<i>During Transfer:</i> Indicate your level of agreement that your organization and the user organization(s) made decisions jointly during (i) development of educational materials; (ii) identification of barriers to implementation; (iii) identification of facilitators to implementation; (iv) selection of transfer strategies; (v) implementation of transfer strategies	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	Each item scored 1 to 5. The factor-based score for this scale was the mean of the responses for all 5 items.	Five of 10 items designed to measure collaboration loaded on this factor. Alpha=0.86; Mean inter-item correlation=0.51; range inter-item correlations=0.39-0.74 Mean=3.5 (1.0); Median=4; IQR=1
<i>During Evaluation:</i> Indicate your level of agreement that your organization and the user organization(s) made decisions jointly during (i) evaluation of transfer	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	Score assigned to each response category of this one item	The remaining single item was used to form the collaboration during evaluation variable. Mean=3.0 (1.4); Median=3; IQR=2
Identification of barriers/facilitators to adoption, implementation by user			
<i>Barriers:</i> To what extent does your organization understand barriers within the user organization(s) that could affect implementation or delivery of REFERENCE INNOVATION by the user	1. Not at all 2. 3. 4.	Score assigned to each response category	Mean=4.0 (0.7); Median=4; IQR=0

Innovation of Dissemination Practice Variable questionnaire item(s)	Response categories	Scoring	Psychometric Properties and/or descriptive statistics (mean , median, inter-quartile range)
organization(s)?	5. Completely		
<i>Facilitators:</i> To what extent does your organization understand facilitators within the user organization(s) that could affect implementation or delivery of [REFERENCE INNOVATION] by the user organization(s)?	1. Not at all 2. 3. 4. 5. Completely	Score assigned to each response category	Median=3.8 (0.8); Median=4; IQR=1
Selection of strategies to overcome barriers or promote facilitators			
<i>Strategies:</i> In transferring [REFERENCE INNOVATION] to user organization(s) did your organization use any of the following strategies (i) print communication; (ii) information technology (iii) resource guides/printed materials; (iv) A-V presentations; (v) Face-to-face contact between your organization and the user organization(s); (vi) live demonstrations; (vii) training/workshops; (viii) on-site consultation to user organization(s); (ix) consultation to user organization(s) by telephone or teleconference; (x) conferences; (xi) knowledge brokers/change agents; (xii) program champion	Yes/no	Positive responses were summed; cumulative frequency was quintiled, then rankings (0 to 4) recoded to create a score from 1 to 5	Kuder-Richardson 20=0.76; Mean=2.8 (1.4); Median=3; IQR=2
<i>Tailoring:</i> Indicate your level of agreement that the strategy(ies) used to transfer [REFERENCE INNOVATION] to the user organization(s) was/were tailored to meet the needs of individual user organization(s)	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	Score assigned to each response category	Mean=3.9 (0.8); Median=4; IQR=0
Design of dissemination plan			
Indicate your level of agreement that plans for transfer of [REFERENCE INNOVATION]: (i) included specific operational objectives; (ii) included a specific timeline with milestones; (iii)	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree	Each item scored 1 to 5. The factor-based score for this scale was the mean of all 5 responses.	All five items loaded on one factor. Alpha=0.87; Mean inter-item

Innovation of Dissemination Practice Variable questionnaire item(s)	Response categories	Scoring	Psychometric Properties and/or descriptive statistics (mean , median, inter-quartile range)
included a detailed budget; (iv) included allocation of tasks; (v) were well documented.	5. Strongly agree		correlation=0.0.51; range inter-item correlations=0.47-0.70 Mean=3.8 (0.9); Median=4; IQR=0.5
Enhancement of user capacity for adoption/implementation			
Did your organization use any of the following strategies to build or enhance capacity (i.e. knowledge, skills and (human and financial resources) in the user organization(s) to assist in the implementation or delivery of [REFERENCE INNOVATION]; (i) provided skill-building re: general prevention/promotion planning, implementation, and evaluation; (ii) provided relevant background information to the user organization(s); (iii) provided specific staff training to the user organization(s) re: [REFERENCE INNOVATION]; (iv) provided print resource materials to the user organization(s); (v) provided electronic resource materials to the user organization(s); (vi) provided technical support to the user organization(s); (vii) provided consultation to the user organization(s); (viii) provided financial assistance (direct funding) to the user organization(s); (ix) organized meetings of user organizations	Yes/no	Positive responses were summed; cumulative frequency was quintiled, then rankings (0 to 4) re-coded to create a score from 1 to 5	Kuder-Richardson 20=0.67; Mean=3.0 (1.4); Median=3; IQR=2
Fidelity to dissemination plan			
Would you say the transfer plans for [REFERENCE INNOVATION] were implemented:	1. with major modifications 2. with minor modification 3. exactly as planned 8. not applicable, no transfer plans were designed	Implementation of transfer plans (3, 8); Transfer plans not implemented (1, 2).	Mean=2.7 (1.1); Median=2.0; IQR=2.5

Innovation of Dissemination Practice Variable questionnaire item(s)	Response categories	Scoring	Psychometric Properties and/or descriptive statistics (mean , median, inter-quartile range)
		In the summative score that was created to serve as the dependent variable, this dichotomous variable, as 0/1 did not provide adequate weight in comparison to all other practices that were scored 1 to 5, therefore a linear transformation was performed to re-code it from 0/1 to 2/4.5. The score '2' represents a mean of '1', '2', and '3' for all other practices; The score 4.5 represents the mean of scores '4' and '5'.	
Evaluation of dissemination process Did your organization do any of the following to evaluate the transfer of [REFERENCE INNOVATION] to the user organization(s): (i) monitor your organization's transfer activities; (ii) evaluate implementation or delivery of [REFERENCE INNOVATION] of user organization(s); (iii) long-term follow-up with user organization(s) to monitor if [REFERENCE INNOVATION] is still being used; (iv) evaluate attainment of your organization's transfer goals/objectives; (v) identify unanticipated effects of transfer; (vi) evaluate user organizations' perceptions of [REFERENCE INNOVATION]	Yes/no	Positive responses were summed; cumulative frequency was quintiled, then rankings (0 to 4) re-coded to create a score from 1 to 5	Kuder-Richardson-20=0.82 Mean=3.0 (1.4); Median=3; IQR=2

Innovation of Dissemination Practice Variable questionnaire item(s)	Response categories	Scoring	Psychometric Properties and/or descriptive statistics (mean , median, inter-quartile range)
(problems, strengths); (vii) evaluate effectiveness of the transfer strategies used.			

* Factor based scores for each scale were computed only for organizations that had data for at least 50% of scale items.

Detailed Description of Variables Pertaining to Potential Correlates of Dissemination Process in Resource Organizations

Variable questionnaire item	Response categories	Scoring used in multivariate analysis †	Psychometric Properties and/or descriptive statistics* †
Structure of resource organization			
<ul style="list-style-type: none"> <i>Age:</i> How long has your organization been in operation, regardless of all its evolutions? <i>Type:</i> Which of the following best describes your organization? <i>Size:</i> Excluding consultants and short term contractual employees, how many FTEs work in your organization? 	<p>Number of months or years to be indicated</p> <ol style="list-style-type: none"> 1. Federal or provincial government 2. Regional health authority 3. Public health dept/agency 4. Para-governmental health agency 5. NGO 6. Professional association 7. Research centre 8. Resource centre 9. Coalition, partnership, alliance <p>Number of FTEs to be indicated</p>	<p>No. of years; logarithmic transformation</p> <p>Formally mandated regional public health organization (PHO) (2, 3); NGO (5); Grouped (9); Other (1, 4, 6-8). Indicator variables for TYPE created with NGO + Grouped categories set as reference.</p> <p>SIZE variable created from this item re: number FTEs at entire organizational level (n=60 responses) and a similar item re: number FTEs at CDP unit/division level (n=46 responses). If organizational response was NOT missing then SIZE= No. FTEs at organization level; if organizational response WAS missing and unit/division response was NOT missing then SIZE=No. FTEs at unit/division</p>	<p>Mean= 30.4; median=20; IQR= 41</p> <p>PHO (31.2%); NGO (34.8%); Grouped (11.7%); Other (23.3%)</p> <p>Mean= 1151.4; Median=12.5; IQR = 71</p>

Variable questionnaire item	Response categories	Scoring used in multivariate analysis †	Psychometric Properties and/or descriptive statistics* †
<ul style="list-style-type: none"> Size: On average, how many volunteers (including Board members) work for your organization each year? Size: How many volunteers does your organization have in total, at the time of the year when there are the most volunteers? Geographical area served: What geographical area does your organization serve? National region location/jurisdiction of organization 	<p>No. volunteers to be indicated</p> <p>Maximum no. volunteers to be indicated</p> <ol style="list-style-type: none"> 1. Region 2. Province 3. Multi-province territory 4. Canada <ol style="list-style-type: none"> 1. Newfoundland 2. Prince Edward Island 3. Nova Scotia 4. New Brunswick 5. Quebec 6. Ontario 7. Manitoba 	<p>level. By using information from both items we created the variable SIZE with n=74 responses. SIZE variable was subsequently logarithmically transformed.</p> <p>Indicator variable created with reference=responses ≤ 12; V1=# missing; V2=responses > 12</p> <p>46 missing; variable not used</p> <p>Scores assigned to each response category; Dichotomous variable created whereby '1'=(2); '0'=(1, 3, 4)</p> <p>West (7-10, 13); Central (5,6); East (1-4, 12); National (11). Indicator variable created with Central set as the reference.</p>	<p>Mean= 245.3; Median=12; IQR= 32.5</p> <p>Mean= 1797.8; Median=45; IQR=386</p> <p>Region (37.7%); Province (52%); Multi-province (1.3%); National (9%)</p> <p>West=31.2%; Central=41.5%; East=16.9%; National =10.4%</p>

Variable questionnaire item	Response categories	Scoring used in multivariate analysis [†]	Psychometric Properties and/or descriptive statistics* [†]
	8. Saskatchewan 9. Alberta 10. British Columbia 11. Canada 12. Atlantic multi-province 13. Prairie multi-province		
Openness/orientation toward dissemination			
<i>Attitude toward linkage:</i> From what you have observed in the past 3 years, collaborating with user organizations... (i) guarantees that the resulting innovation will be relevant to user organizations; (ii) ensures that innovation transfer strategies will be successful; (iii) is the only effective way to solve problems in innovation development; (iv) is the only effective way to solve problems in innovation transfer.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	Each item scored 1 to 5. The factor-based score for this scale was the mean of all 4 responses.	Seven items designed to measure attitudes toward collaboration loaded onto 2 factors. Four of seven items loaded onto this factor. Alpha=0.75; Mean inter-item correlation=0.43; range inter-item correlations=0.30-0.65 Mean=4.1(0.6); Median=4.0; IQR=0
<i>Attitude toward the process of collaboration:</i> From what you have observed in the past 3 years, collaborating with user organizations... (i) is too difficult a process to carry out routinely; (ii) takes too much time; (iii) is not worth the investment.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	Each item scored 1 to 5. All items negatively worded therefore scores reversed prior to PCA analysis. The factor-based score for this scale was the mean of all 3 responses.	Three of seven items loaded onto a second factor. Alpha=0.70; Mean inter-item correlation=0.44; range inter-item correlations=0.30-0.66 Mean=3.9 (0.7); Median=4.0; IQR=0
<i>Organizational support for professional development in dissemination:</i> Your organization supports training or professional development to improve transfer practices	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	Score assigned to each response category	Mean=3.9 (1.1); Median=4.0; IQR=2

Variable questionnaire item	Response categories	Scoring used in multivariate analysis †	Psychometric Properties and/or descriptive statistics* †
<i>Frequency of professional development in dissemination:</i> In the last 3 years, how often has staff in your organization participated in professional development/training for transfer practices?	1. 0 times 2. 1 time 3. 2-3 times 4. 4-5 times 5. Over 5 times	Score assigned to each response category	Mean=2.7 (1.7); Median=3; IQR=2
Incentives to disseminate:			
<i>Dissemination incentive in the form of job satisfaction:</i> Indicate how important each of the following is in encouraging staff to engage in transfer practices within your organization? (i) satisfaction in seeing an innovation that was developed become implemented; (ii) organization values this work; (iii) feedback from user organization(s); (iv) meeting objective(s) of the program.	1. Not at all important 2. 3. 4. 5. Very important	Each item scored 1 to 5. The factor-based score for this scale was the mean of all 4 responses.	Eight items designed to measure incentives loaded onto two factors. Four of eight loaded on this factor. Alpha=0.83; Mean inter-item correlation=0.55; range inter-item correlations=0.50-0.64 Mean=4.6 (0.5); Median=5; IQR=1
<i>Dissemination incentive in the form of professional recognition:</i> Indicate how important each of the following is in encouraging staff to engage in transfer practices within your organization? (i) being asked to join governmental or other forums; (ii) professional recognition from outside your organization; (iii) professional recognition from within your organization.	1. Not at all important 2. 3. 4. 5. Very important	Each item scored 1 to 5. The factor-based score for this scale was the mean of all 3 responses.	Three of eight loaded onto this factor. Alpha=0.72; Mean inter-item correlation=0.46; range inter-item correlations=0.31-0.62 Mean=3.5 (0.9) Median=4; IQR=1
<i>Dissemination incentive in the form of access to funding:</i> Indicate how important each of the following is in encouraging staff to engage in transfer practices within your organization? (i) Access to funding	1. Not at all important 2. 3. 4. 5. Very important	Score assigned to each response category	This remaining single item was used to create another incentive variable. Mean=4.25 (0.8); Median=4; IQR=1.0

Variable questionnaire item	Response categories	Scoring used in multivariate analysis [†]	Psychometric Properties and/or descriptive statistics ^{* †}
Organizational capacity (skills and resources)			
<i>Skill at planning/implementing dissemination:</i> Staff within your organization have the skills to: (i) select appropriate transfer strategies to overcome barriers within user organizations to implementation or delivery of CDP innovations; (ii) select appropriate transfer strategies to promote facilitators within user organizations to implementation or delivery of CDP innovations; (iii) design transfer plans; (iv) build capacity within user organizations to facilitate implementation or delivery of CDP innovations; (v) implement transfer plans; (vi) Your organization is skilled (i.e. has expertise) in terms of transferring CDP innovations to user organizations.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	Each item scored 1 to 5. The factor-based score for this scale was the mean of these 6 responses.	12 items designed to measure skills loaded onto 3 factors. Six loaded onto this one factor. Alpha=0.89; Mean inter-item correlation=0.56; range inter-item correlations=0.39-0.83 Mean=3.9 (0.7); Median=4; IQR=0
<i>Skill at evaluating dissemination:</i> Staff within your organization have the skills to: (i) monitor transfer activities; (ii) evaluate effectiveness of transfer strategies used; (iii) evaluate if implementation of CDP innovations by user organizations took place	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	Each item scored 1 to 5. The factor-based score for this scale was the mean of all 3 responses.	Three items loaded onto this one factor. Alpha=0.78; Mean inter-item correlation=0.54; range inter-item correlations=0.42-0.74 Mean=3.8 (0.7); Median=4; IQR=1
<i>Skill at collaborating with user organizations:</i> Staff within your organization have the skills to: (i) identify the need for CDP innovations; (ii) develop a process for the exchange of knowledge and ideas between your organization and user organization; (iii) collaborate effectively with user organization.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	Each item scored 1 to 5. The factor-based score for this scale was the mean of all 3 responses.	Three items loaded onto this one factor. Alpha=0.65; Mean inter-item correlation=0.38; range inter-item correlations=0.23-0.48 Mean=4.2 (0.5); Median=4; IQR=0

Variable questionnaire item	Response categories	Scoring used in multivariate analysis ‡	Psychometric Properties and/or descriptive statistics* †
<p><i>External sources of funding specifically allocated for dissemination of innovations:</i> Has your organization obtained external sources of funding (that include support specifically allocated for innovation transfer) from any of the following sources in the past 3 years?: (i) research funding organization; (ii) Health Canada; (iii) other federal ministry; (iv) ministry/dept of health (provincial; (v) other provincial ministry; (vi) National NGO; (vii) Provincial NGO; (viii) major charity; (ix) private funding; (x) fundraising; (xi) other</p>	Yes/no	1/0; Positive responses were summed to create a continuous score	Mean=0.92 (1.4); Median=0; IQR=1
<p><i>Adequacy of resources for dissemination:</i> In the past 3 years, your organization has allocated... (i) a sufficient number of staff to transfer practices; (ii) appropriately skilled staff to transfer practices; (iii) enough budget for transfer practices.</p>	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	Each item scored 1 to 5. The factor-based score for this scale was the mean of all 3 responses.	All three items designed to measure adequacy of resources loaded on one factor. Alpha=0.75; Mean inter-item correlation=0.51; range inter-item correlations=0.46-0.57 Mean=3.1 (0.8); Median=3; IQR=1
<p>User-centeredness <i>User-centeredness:</i> From what you have observed in the past 3 years, your organization...: (i) focuses the process of innovation development on user organizations' needs; (ii) includes user organizations' ideas in every step of innovation development; (iii) focuses the process of innovation transfer on user organizations' needs; (iv) includes user organizations' ideas in every step of</p>	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	Each item scored 1 to 5. The factor-based score for this scale was the mean of these 5 responses.	Six of 9 items designed to measure quality of collaboration loaded on one factor. [§] Alpha=0.81; Mean inter-item correlation=0.39; range inter-item correlations=0.10-0.67 Mean=4.0 (0.7); Median=4.0; IQR=0

Variable questionnaire item	Response categories	Scoring used in multivariate analysis †	Psychometric Properties and/or descriptive statistics* †
innovation transfer; (v) treats user organizations as equal partners during innovation development; (vi) treats user organizations as equal partners during innovation transfer.			
Commitment to dissemination			
<i>Designated person in charge of dissemination:</i> Is there one person within your organization who is formally mandated to be in charge of innovation transfer?	Yes/No	1/0	Yes=30%; No=70%
<i>Dissemination considered part of job:</i> To what extent is transfer considered part of the job of those who develop innovations?	1. Not at all 2. 3. 4. 5. Completely	Score assigned to each response category	Mean=4.1 (0.8); Median=4; IQR=1.0
<i>Championing of dissemination:</i> How actively are transfer practices championed in your organization (over and above anyone formally mandated to be in charge of innovation transfer)?	1. Not at all 2. 3. 4. 5. Very actively	Score assigned to each response category	Mean=4.1 (0.8); Median=4; IQR=1
Organizational flexibility			
<i>User type diversity:</i> In the past 3 years has your organization transferred CDP innovations to any of the following types of organizations? (i) regional health authorities; (ii) public health units/agencies; (iii) community health centres; (iv) NGOs; (v) government depts.; (vi) school boards; (vii) health profession associations; (viii) regional chapters/branches of your organization; (ix) community groups; (x) other health organizations; (xi) other organizations..	Yes/no	1/0; Positive responses were summed to create a continuous score	Mean=5.3 (2.7); Median=5; IQR=4

* Factor based scores for each scale were computed only for organizations that had data for at least 50% of scale items.

† Mean, frequency, median, inter-quartile range

‡ Reference category for all indicator variables was the largest category.

§ Items that did not load included: Limits information it shares with user organizations; Prioritizes understanding the needs of user organizations; Prioritizes understanding the culture of user organizations.

APPENDIX 10

Dissemination Study questionnaire items and corresponding factor loadings after varimax rotation

No	Item*	No. Components			Cumulative proportion variance explained
		1	2	3	
Dissemination Practice					
	PCA 1: Collaboration with user organizations during dissemination of REFERENCE INNOVATION	Collaboration during transfer	Collaboration during development		0.60
38_1	Identification of need †	0.00	0.88		
38_2	Background research †	0.47	0.39		
38_3	Conceptualization †	0.30	0.82		
38_4	Development/adaptation †	0.51	0.55		
38_5	Development/adoption of educational materials	0.65	0.29		
38_6	Identification of barriers to implementation	0.81	0.08		
38_7	Identification of facilitators to implementation	0.89	0.07		
38_8	Selection of transfer strategies	0.69	0.35		
38_9	Implementation of transfer strategies	0.81	0.20		
38_10	Evaluation of transfer †	0.44	0.32		
	PCA 2: Dissemination Plan Design	Design of Dissemination Plan			0.67
35_1	Included specific operational objectives	0.82			
35_2	Included a specific timeline with milestones	0.84			
35_3	Included a detailed budget	0.80			
35_4	Included allocation of tasks	0.83			
35_5	Plans were well documented	0.79			

No	Item*	No. Components			Cumulative proportion variance explained
		1	2	3	
Potential Correlates of Dissemination					
	PCA 3: Openness/orientation toward dissemination	Attitude toward linkage	Attitude toward process of collaboration		0.61
40_1	Guarantees that the resulting innovation will be relevant to user organizations	0.71	0.25		
40_2	Ensures that innovation transfer strategies will be successful	0.74	0.18		
40_3rev	Is too difficult a process to carry out routinely	0.12	0.90		
40_4rev	Takes too much time	-0.14	0.84		
40_5	Is the only effective way to solve problems in innovation development	0.78	-0.08		
40_6	Is the only effective way to solve problems in innovation transfer	0.78	-0.06		
40_7rev	Is not worth the investment	0.16	0.58		
	PCA 4: Incentives to disseminate	Dissemination incentive in the form of job satisfaction	Dissemination incentive in the form of professional recognition		0.61
67_1	Being asked to join governmental or other forums	0.10	0.64		
67_2	Professional recognition from outside your organization	0.24	0.85		
67_3	Professional recognition from within your organization	0.06	0.84		

No	Item*	No. Components			Cumulative proportion variance explained
		1	2	3	
67_4	Satisfaction in seeing an innovation that was developed become implemented	0.84	0.06		
67_5	Organization values this work	0.79	0.14		
67_6	Access to funding †	0.52	0.38		
67_7	Feedback from user organizations	0.77	0.18		
67_8	Meeting objectives of the program	0.78	0.10		
	PCA 5: Skills	Skill at planning/ implementing dissemination	Skill at evaluating dissemination	Skill at collaborating with user organizations	0.62
48	Your organization is skilled (i.e. has expertise) in terms of transferring CDP innovations to user organizations	0.58	0.23	0.31	
49_1	Identify the need for CDP innovations	0.17	0.00	0.66	
49_2	Develop a process for the exchange of knowledge and ideas between your organization and user organizations (i.e. a linking system)	0.36	0.20	0.70	
49_3	Collaborate effectively with user organizations	0.12	0.09	0.77	
49_4	Identify barriers and facilitators within user organizations related to implementation or delivery of CDP innovations ‥	0.56	0.19	0.52	
49_5	Select appropriate transfer strategies to overcome barriers within user organizations for implementation or delivery of CDP innovations	0.83	0.03	0.25	
49_6	Select appropriate transfer strategies to	0.85	-0.01	0.26	

No	Item*	No. Components			Cumulative proportion variance explained
		1	2	3	
	promote facilitators within user organizations for implementation or delivery of CDP innovations				
49_7	Design transfer plans	0.81	0.21	0.12	
49_8	Build capacity within user organizations to facilitate implementation or delivery of CDP innovations	0.73	0.16	0.14	
49_9	Implement transfer plans	0.80	-0.07	0.18	
49_10	Monitor transfer activities	0.23	0.69	0.05	
49_11	Evaluate effectiveness of transfer strategies used	0.16	0.86	0.18	
49_12	Evaluate if implementation of CDP innovations by user organizations took place	-0.12	0.88	0.05	
50	Your organization supports training or professional development to improve transfer practices ⁸	0.37	0.30	0.07	
	<i>PCA 6: User-centeredness</i>	User-centeredness	Not retained**	Not retained**	0.42
39_1	Focuses the process of innovation development on user organizations' needs	0.78	0.03	-0.42	
39_2	Includes user organizations' ideas in every step of innovation development	0.75	0.35	0.13	
39_3	Focuses the process of innovation transfer on user organizations' needs	0.75	0.04	-0.15	
39_4	Includes user organizations' ideas in every step of innovation transfer	0.62	0.45	0.23	

No	Item*	No. Components			Cumulative proportion variance explained
		1	2	3	
39_5rev	Limits information it shares with user organizations	0.05	-0.11	0.87	
39_6	Prioritizes understanding the needs of user organizations	0.11	0.91	-0.08	
39_7	Prioritizes understanding the culture of user organizations	0.16	0.89	-0.10	
39_8	Treats user organizations as equal partners during innovation development	0.65	0.42	0.12	
39_9	Treats user organizations as equal partners during innovation transfer	0.67	0.03	0.27	
	<i>PCA 7: Adequacy of resources</i>	Adequacy of resources to disseminate			0.67
65_1	A sufficient number of staff to transfer practices	0.84			
65_2	Appropriately skilled staff to transfer practices	0.78			
65_3	Enough budget for transfer practices	0.83			

* Items with factor loadings ≥ 0.55 were retained and appear bolded

† Items 38_1 to 38_4 were “forced” to create a second factor representing collaboration during development of the innovation.

Initially, two of the four items loaded strongly on to this second factor. Item-total correlations for all four items ranged 0.42-0.71 with $\alpha = 0.75$.

‡ Item retained as an individual variable

§ Item dropped, did not load

|| Item dropped; loaded on to more than one component

** Component not retained; did not meet criterion that factors comprise \geq three items

APPENDIX 11



Building the backbone for organisational research in public health systems: development of measures of organisational capacity for chronic disease prevention

Nancy Hanusaik, Jennifer L O'Loughlin, Natalie Kishchuk, John Eyles, Kerry Robinson and Roy Cameron

J. Epidemiol. Community Health 2007;61:742-749
doi:10.1136/jech.2006.054049

Updated information and services can be found at:
<http://jech.bmj.com/cgi/content/full/61/8/742>

These include:

References

This article cites 29 articles, 12 of which can be accessed free at:
<http://jech.bmj.com/cgi/content/full/61/8/742#BIBL>

Rapid responses

You can respond to this article at:
<http://jech.bmj.com/cgi/eletter-submit/61/8/742>

Email alerting service

Receive free email alerts when new articles cite this article - sign up in the box at the top right corner of the article

Notes

To order reprints of this article go to:
<http://www.bmjjournals.com/cgi/reprintform>

To subscribe to *Journal of Epidemiology and Community Health* go to:
<http://www.bmjjournals.com/subscriptions/>

THEORY AND METHODS

Building the backbone for organisational research in public health systems: development of measures of organisational capacity for chronic disease prevention

Nancy Hanusaik, Jennifer L O'Loughlin, Natalie Kishchuk, John Eyles, Kerry Robinson, Roy Cameron

J Epidemiol Community Health 2007;61:742-749. doi: 10.1136/jech.2006.054049

See end of article for authors' affiliations

Correspondence to:
Nancy Hanusaik,
Department of
Epidemiology, Biostatistics
and Occupational Health,
McGill University, 1020 Pine
Avenue West, Montréal,
Québec, Canada H3S 1A2;
nancy.hanusaik@mail.
mcgill.ca

Accepted for publication
21 February 2007

Background: Research to investigate levels of organisational capacity in public health systems to reduce the burden of chronic disease is challenged by the need for an integrative conceptual model and valid quantitative organisational level measures.

Objective: To develop measures of organisational capacity for chronic disease prevention/healthy lifestyle promotion (CDP/HLP), its determinants, and its outcomes, based on a new integrative conceptual model.

Methods: Items measuring each component of the model were developed or adapted from existing instruments, tested for content validity, and pilot tested. Cross sectional data were collected in a national telephone survey of all 216 national, provincial, and regional organisations that implement CDP/HLP programmes in Canada. Psychometric properties of the measures were tested using principal components analysis (PCA) and by examining inter-rater reliability.

Results: PCA based scales showed generally excellent internal consistency (Cronbach's $\alpha=0.70$ to 0.88). Reliability coefficients for selected measures were variable (weighted $\kappa(\kappa_w)=0.11$ to 0.77). Indicators of organisational determinants were generally positively correlated with organisational capacity ($r_s=0.14$ – 0.45 , $p<0.05$).

Conclusions: This study developed psychometrically sound measures of organisational capacity for CDP/HLP, its determinants, and its outcomes based on an integrative conceptual model. Such measures are needed to support evidence based decision making and investment in preventive health care systems.

Chronic diseases, including cardiovascular disease (CVD), cancer, diabetes, and respiratory illness, remain an enormous and growing burden on health care systems in Canada^{1,2} and elsewhere.³ Although many chronic diseases are preventable, there are few examples of successful chronic disease prevention and healthy lifestyle promotion (CDP/HLP) programmes that reduce population level morbidity and mortality.⁴ Based on increased understanding that health systems are important socioenvironmental determinants of health,⁵ researchers are now investigating whether health systems, and more specifically organisations that develop and deliver CDP/HLP programmes within health systems, have adequate capacity to contribute effectively to reducing the chronic disease burden. However, these efforts have encountered at least three challenges.

First, despite growing interest in this area, there is no widely accepted definition of organisational capacity in the health context. Organisational capacity has been defined variably in the research literature, borrowing from definitions used in research on practitioner capacity⁶ or community/organisational capacity building for health promotion, or both.^{7–14} Within the public health context, Hawe *et al*¹⁵ conceptualised organisational capacity for health promotion ("capacity of an organisation to tackle a particular health issue") as having at least three domains: organisational commitment, skills, and structures. Labonte and Laverack¹² described government/non-governmental organisational capacity as the structures, skills, and resources required to deliver programme responses to specific health problems. Within the CVD prevention/heart health promotion domain, organisational capacity for conducting effective health promotion programmes has been conceptualised as a set of skills and resources.¹⁶ This definition was expanded to include knowledge¹⁷ and commitments.¹⁸ Others¹⁹

have adopted the Singapore Declaration definition of organisational capacity⁵ as the capability of an organisation to promote health, formed by the will to act, infrastructure, and leadership. Finally, Naylor *et al*²⁰ included infrastructure, collaboration, evidence base, policy, and technical expertise as components of a capable organisation. Overall, skills and resources to conduct CDP/HLP programmes emerge in these reports as the two most common dimensions of organisational capacity in the public health context.

An issue related to lack of conceptual clarity is that, while substantial efforts have been made to identify dimensions of organisational capacity, few investigators have formulated clear conceptual boundaries between organisational capacity, its determinants, and its outcomes. In their surveys of Ontario public health units (PHUs) in 1994 and 1996, Elliott *et al*²¹ and Taylor *et al*¹⁶ distinguished between predisposition (that is, level of importance ascribed to public health practices supportive of heart health initiatives), capacity (effectiveness in performing these practices), and implementation of heart health activities. This conceptual framework posited that capacity and predisposition are interrelated, and these in turn relate to implementation. In empirical testing of the framework, there were moderate correlations between predisposition and capacity, moderate to strong correlations between capacity and implementation, but no correlation between predisposition and implementation. Building on this framework, Riley *et al*²² undertook path analysis using the same database to examine the relations between 1997 levels of implementation and four sets of determinants: internal organisational factors; external

Abbreviations: CDP/HLP, chronic disease prevention/healthy lifestyle promotion; CVD, cardiovascular disease; NGO, non-governmental organisation; PCA, principal components analysis; PHU, public health unit

system factors; predisposition; and capacity. The results supported a strong direct relation between capacity and implementation, and provided evidence that external system factors (that is, partnerships, support from resource centres) and internal organisational factors (coordination of programmes within the health unit) have an indirect impact on implementation by influencing capacity. Predisposition was not retained in the model. Priority given to heart health within PHUs had a direct relation with implementation. In 2001, McLean *et al*¹⁸ proposed that the relation between organisational capacity and heart health promotion action is mediated by external factors such as funding and policy frameworks of provincial and national governments, and public understanding of health promotion. However external factors were treated as one of four indices of capacity in their analyses.

A second challenge is the lack of validated quantitative measures of organisational capacity, its determinants, and its outcomes. Qualitative work has predominated in this area, and although informative in terms of rich descriptive and locally meaningful information, qualitative research does not lend itself to generalisation across organisations and jurisdictions. Quantitative work is needed to support qualitative work, and to provide decision makers with standardised tools for measuring, managing, and improving CDP/HLP capacity. Measures of organisational capacity developed to date often include large numbers of diverse items in an effort to capture all possible dimensions of capacity. Although content validity is reported to be high for most measures,²³ data on construct validity and reliability are limited, and few investigators have formally tested the psychometric properties of their measures.^{24 25}

A third challenge is that there are no nationally representative data on levels of organisational capacity in organisations with mandates for CDP/HLP. Such data are needed to guide evidence based investment in building preventive health systems, and in particular to identify gaps and monitor changes in capacity over time. To date, surveys have been restricted to include only formally mandated public health organisations in specific geographical regions, with the exception of one survey that included both health community and non-health-community agencies involved in heart health promotion¹⁷, and comparison across surveys is impeded because of the differing operational definitions of organisational capacity.

To address these challenges, we undertook a national survey of all organisations in Canada with mandates for CDP/HLP. The specific aims of this paper are twofold. First, we introduce a conceptual framework for research on preventive health services. Second, we describe the development of quantitative

measures of organisational capacity for CDP/HLP, as well as possible determinants and outcomes of organisational capacity.

CONCEPTUAL FRAMEWORK

Our conceptual framework (fig 1) addresses the challenges outlined above by, first, adopting a parsimonious conceptualisation of capacity that encompasses skills and resources; second, separating factors purportedly related to creating capacity into organisational or structural determinants of capacity; third, postulating links between capacity and outcomes of capacity (that is, although there are many potential outcomes of capacity, level of involvement in CDP/HLP activities is the outcome of most interest in our framework); fourth, positioning facilitators as mediators between capacity and outcomes; and fifth, more generally, adopting an approach suitable for empirical testing of the overall model. Rather than creating global scores that summarise factors within the conceptual framework, we retain each variable as a unique entity. This will enhance empirical testing of the framework by allowing investigation of each factor separately, as well as the association between factors.

METHODS

Based on a comprehensive review of published reports, items were adapted from earlier questionnaires designed to measure organisational practices/activities for (heart) health promotion^{8 11 15 26–36} or developed *de novo*. The content of an initial version of the questionnaire was validated by four researchers (recognised nationally for their work related to chronic disease health policy, health promotion, public health, and dissemination), and then a revised version was pretested in telephone interviews with nine organisations that delivered prevention activities unrelated to chronic disease. Pretest respondents included executive directors and programme or evaluation staff from public health departments, resource centres, or non-profit organisations across Canada with mandates for infectious disease, injury prevention, or the health and development of children. The final version comprised 258 items covering the following: organisational characteristics (that is, structural determinants of capacity) (14 items); organisational supports of capacity (21 items); skills (41 items); resources (20 items); involvement in CDP/HLP (30 items); implementation of CDP/HLP activities (60 items); partnerships (seven items); facilitators/barriers (24 items); respondent characteristics (seven items); and skip or descriptive items (34 items). Most response sets were five point Likert scales, with degree/extent or agreement response formats ranging from “1” (very low/strongly disagree) to “5” (very high/strongly agree).

Two francophone translators translated the questionnaire from English into French. Equivalence between the source and target language versions was verified according to recommendations for cross cultural adaptations of health measures.^{37 38}

To identify organisations for inclusion in the survey, we undertook a complete census of all regional, provincial, and national organisations across Canada with mandates for the primary prevention of chronic disease (that is, diabetes, cancer, CVD, or chronic respiratory illness) or for the promotion of healthy eating, non-smoking, or physical activity. Government departments, regional health authorities/districts, public health units, non-governmental organisations (NGOs) and their provincial/regional divisions, paragonovernmental health agencies, resource centres, professional organisations, and coalitions, alliances and partnerships were identified in an exhaustive internet search and through consultations with key informants across Canada. All 353 organisations identified were invited to participate. Initial screening interviews were conducted with senior managers to confirm that the

Table 1 Selected characteristics of the study population (n = 216)

Organisation	
Organisation type (n (%))	
Formal public health*	103 (48)
NGO	54 (25)
Alliance, coalition, partnership	41 (19)
Other†	18 (8)
Size, median (range)	
Age (years)	27 (1.5 to 150)
Number full time equivalents	53 (0 to 25 000)
Number volunteers	35 (0 to 50 000)
Geographical area served (n (%))	
Regional	154 (71)

*Regional health authorities and public health departments/agencies.

†Government, paragonovernmental health agencies, professional associations, resource centres, other.

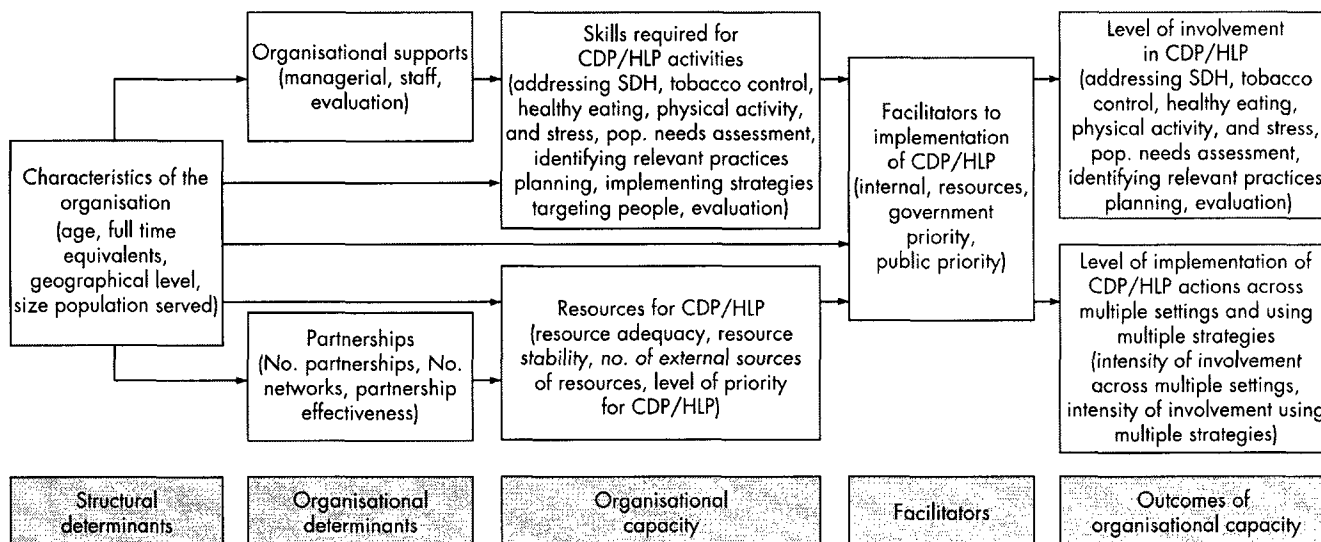


Figure 1 Conceptual framework depicting potential determinants and outcomes of organisational capacity for chronic disease prevention and healthy lifestyle promotion (CDP/HLP). Organisational capacity for CDP/HLP is conceptualised as resources and skills required to implement CDP/HLP activities. *Structural determinants* of capacity include characteristics of the organisation. *Organisational determinants* include supports for developing/maintaining organisational capacity, as well as partnerships with other organisations. These are explicitly separated from capacity because they are seen as possible determinants of specific skills required for CDP/HLP capacity. *Facilitators* include factors internal and external to the organisation that mediate the impact of capacity on outcomes. Finally *outcomes* related to capacity include level of involvement in specific types of CDP/HLP activities, and extent of implementation (intensity of involvement) of CDP/HLP activities across multiple settings and using multiple implementation strategies. SDH, social determinants of health.

organisation met the inclusion criteria, to solicit participation, and to obtain contact information for potential respondents. Inclusion criteria were: that the organisation was mandated to undertake primary prevention of chronic disease; that it was involved in developing/adopting programmes, practice tools, skill or capacity building initiatives, campaigns, activities, and so on; and that it had transferred these innovations to other organisations in the past three years or had implemented the innovations in a specific target population.

Organisations that adopted or developed CDP/HLP innovations with the intention of delivering these innovations in specific populations were labelled "user" organisations. Those that developed and transferred CDP/HLP innovations to other organisations were labelled "resource" organisations. Of 280 organisations screened and eligible, 49 were resource organisations, 180 were user organisations, and 32 were both user and resource organisations. Sixty-eight organisations were not eligible to participate (that is, they were mandated to provide secondary prevention, they targeted aboriginal populations only, or they were primarily involved in advocacy activities, fund allocation, fund raising, facilitation of joint efforts among organisations, research only, or knowledge transfer (not developing/adopting CDP/HLP innovations for implementation). Nineteen eligible organisations declined to participate. The response proportion was 92%.

Data were collected in structured telephone interviews (mean length 43 ± 17 minutes) with individuals identified by the senior manager as most knowledgeable about implementation/delivery of CDP/HLP programmes, practices, campaigns, or activities. One interview was conducted per organisation, except in organisations where senior managers identified more than one autonomous division/branch within the organisation that conducted CDP/HLP activities. In these organisations, interviews were conducted with one knowledgeable person in each autonomous division. Interviews were conducted in English or French between October 2004 and April 2005 by nine trained interviewers. Respondents included senior/middle managers, service providers, and professional staff. Random

monitoring of interviews was conducted for quality control. Inconsistencies and incomplete data were resolved in telephone calls or e-mails.

To assess interrater reliability, a second interview was completed in a subsample of 26 organisations, with a second individual knowledgeable about implementation/delivery of CDP/HLP programmes, practices, campaigns, or activities. Respondents within the same organisation were interviewed separately by the same interviewer.

Data were entered into a database management system developed by DataSpect Software, Montreal, Quebec. All data entries were verified for accuracy by one investigator (NH).

Data analysis

This analysis pertains to 216 "user organisations," which represent a complete census of Canadian organisations engaged in adopting or developing and implementing CDP/HLP innovations in select target populations.

We undertook separate psychometric analyses for subsets of items selected to measure each construct in the conceptual framework, in order to assess unidimensionality and internal consistency. To determine whether principal components analysis (PCA) was an appropriate analytic option, we undertook the following checks: assessment of normality in individual items; verification of the absence of outliers; and examination of patterns of missing data.³⁹ No imputation of missing data was required because few data were missing. All Bartlett's tests of sphericity achieved significance, and all Kaiser-Meyer-Olkin coefficients were ≥ 0.6 , showing that the data were appropriate for PCA analysis. The principal components method with varimax rotation was used to extract factors with eigenvalues greater than 1. Decisions about the number of factors to retain were based on Cattell's scree test⁴⁰ and the number of factors needed to account for $\geq 50\%$ of the variance in the measured variables.⁴¹

Items with factor loadings ≥ 0.44 were retained to construct unit weighted scales, with stipulation that an item could not be retained in more than one factor, that each factor contained a

Table 2 Measures of organisational capacity, and of potential determinants and outcomes of organisational capacity, including psychometric properties of scales developed

Measure*	No of items	Cronbach's α	Mean (SD) inter-item correlation	Range of inter-item correlations	Highest loading item
Organisational supports†					
Managerial	9	0.88	0.49 (0.09)	0.37 to 0.73	Managers are accessible regarding CDP/HLP activities
Staff	6	0.72	0.32 (0.12)	0.21 to 0.67	There are professional development opportunities to learn about CDP/HLP
Evaluation	3	0.77	0.52 (0.17)	0.40 to 0.71	Monitoring and evaluation information about our CDP/HLP activities is available
Partnerships†					
Effectiveness	5	0.75	0.37 (0.11)	0.25 to 0.60	Partnerships with other organisations are bringing new ideas about CDP/HLP to your organisation
Skills to address‡					Over the last three years, how would you rate your organisation's skill level:
Social determinants of health	6	0.86	0.50 (0.12)	0.27 to 0.72	-in CDP/HLP activities that address social exclusion?
Population needs assessment	3	0.80	0.56 (0.16)	0.47 to 0.74	-for assessing the prevalence of risk factors?
Identify relevant practices	6	0.85	0.49 (0.10)	0.35 to 0.70	-for reviewing CDP/HLP activities developed by other organisations to see if they can be used by your organisation?
Planning	5	0.88	0.57 (0.08)	0.49 to 0.70	-for developing action plans for CDP/HLP?
Implementation strategies	6	0.80	0.39 (0.07)	0.17 to 0.46	-for service provider skill building?
Evaluation	6	0.88	0.55 (0.09)	0.41 to 0.73	-for measuring achievement of CDP/HLP objectives?
Resources§					
Adequacy	3	0.77	0.52 (0.14)	0.41 to 0.68	How adequate are the funding levels for CDP/HLP activities in your organisation?
Facilitators#					
Internal	6	0.72	0.32 (0.13)	0.16 to 0.57	Organisational structure for CDP/HLP
Resources	4	0.83	0.55 (0.17)	0.38 to 0.79	Usefulness of the provincial resource organisations for CDP/HLP
Government priority	5	0.76	0.36 (0.17)	0.18 to 0.74	Level of provincial priority for CDP/HLP
Public priority	5	0.70	0.31 (0.13)	0.19 to 0.58	Level of public understanding of CDP/HLP
Level of involvement¶					Over the last three years, how would you rate your organisation's involvement in:
SDH	6	0.84	0.48 (0.10)	0.30 to 0.67	-CDP/HLP activities that address socioeconomic status?
Population needs assessment	3	0.81	0.57 (0.15)	0.47 to 0.75	-assessing the prevalence of risk factors?
Identify relevant practices	6	0.84	0.46 (0.12)	0.29 to 0.70	-finding relevant best practices in CDP/HLP to see if they can be used by your organisation?
Planning	5	0.86	0.54 (0.10)	0.43 to 0.71	-developing action plans for CDP/HLP?
Evaluation	6	0.86	0.50 (0.12)	0.32 to 0.77	-measuring achievement of CDP/HLP objectives?
Intensity of involvement – multiple settings¶, **, ††					How would you rate your organisation's level of involvement in:
Tobacco control	4	0.73	0.41 (0.04)	0.37 to 0.46	-tobacco control activities in the following settings?
Healthy eating	4	0.64	0.30 (0.11)	0.12 to 0.40	-healthy eating activities in the following settings?
Physical activity	4	0.71	0.38 (0.15)	0.10 to 0.54	-physical activity activities in the following settings?
Mixed risk factor‡‡	4	0.70	0.35 (0.12)	0.12 to 0.47	-multiple risk factor activities in the following settings?
Multiple settings score	16	0.89	0.35 (0.15)	-0.01 to 0.74	Score based on quintiles of cumulative frequency distribution of the sum of the above four variables
Intensity of involvement – multiple strategies¶, §§, ##					How would you rate your organisation's level of involvement in:
Tobacco control	11	0.87	0.38 (0.14)	0.03 to 0.69	-tobacco control activities using the following strategies?
Healthy eating	11	0.86	0.36 (0.14)	0.07 to 0.71	-healthy eating activities using the following strategies?
Physical activity	11	0.89	0.43 (0.11)	0.20 to 0.72	-physical activity activities using the following strategies?
Mixed risk factor‡‡	11	0.90	0.42 (0.13)	0.12 to 0.74	-multiple risk factor activities using the following strategies?
Multiple strategies score	44	0.96	0.33 (0.14)	-0.06 to 0.79	Score based on quintiles of cumulative frequency distribution of the sum of the above four variables

*Measures providing no information on psychometric properties (single items or not PCA based) are not shown; numbers used in analyses varied: organisational supports (207–215); partnerships (215); skills (213–216); resources (215); facilitators (216); level of involvement (213–216); intensity of involvement across multiple settings (93–190); intensity of involvement using multiple strategies (92–189).

†Response category 1 = strongly disagree to 5 = strongly agree; ‡1 = poor to 5 = very good; §1 = much less than adequate to 5 = more than adequate; #–3 = strong barrier to +3 = strong facilitator; ¶1 = very low to 5 = very high.

**Settings included schools, workplaces, health care settings, community at large.

††For intensity of involvement across multiple settings for individual risk factors, items were summed, creating a range from 4 to 20. This total was recoded from 1 to 5 with 1 = least intensely involved (sum 4–7); 2 = less intensely involved (sum 8–10); 3 = moderately involved (sum 11–12); 4 = highly involved (sum 14–16); 5 = very highly involved (sum 17–20). For intensity of involvement (multiple settings score): 16 responses were summed, creating a range from 16 to 80. These totals were recoded from 1 to 5 based on quintiles of the cumulative frequency.

‡‡Mixed risk factor accounts for activities that combine two or more behavioural risk factors (tobacco, nutrition, physical activity); no double counting.

§§Strategies included: group development; public awareness and education; skill building at individual level; healthy public policy development; advocacy; partnership building; community mobilisation; facilitation of self help groups; service provider skill building; creating healthy environments; volunteer recruitment and development.

##For intensity of involvement using multiple strategies for individual risk factors, items were summed creating a range from 11 to 55. Total was recoded from 1 to 5 with 1 = least intensely involved (sum 11–20); 2 = less intensely involved (sum 21–28); 3 = moderately involved (sum 29–36); 4 = highly involved (sum 37–44); 5 = very highly involved (sum 45–55). For intensity of involvement (multiple strategies score): 44 responses were summed, creating a range from 44 to 220. These totals were recoded from 1 to 5, based on quintiles of the cumulative frequency.

Table 3 Interrater reliability of measures of potential outcomes of organisational capacity (n = 17 pairs of raters)*

	Per cent agreement	Weighted κ (95% CI)
Level of involvement		
SDH	41.2	0.32 (0.00 to 0.65)
Tobacco control	41.2	0.65 (0.38 to 0.93)
Healthy eating	47.1	0.55 (0.20 to 0.89)
Physical activity	47.1	0.59 (0.25 to 0.92)
Stress	35.3	0.42 (0.01 to 0.83)
Population needs assessment	31.3	0.54 (0.26 to 0.82)
Identifying relevant practices	50.0	0.25 (-0.20 to 0.70)
Planning	47.1	0.27 (-0.14 to 0.69)
Evaluation	35.3	0.11 (-0.27 to 0.48)
Intensity of involvement across multiple settings		
Tobacco control	66.7	0.77 (0.50 to 1.04)
Physical activity	55.6	0.40 (-0.21 to 1.01)
Healthy eating	12.5	0.45 (0.02 to 0.89)
Mixed risk factor	56.3	0.77 (0.65 to 0.90)
Multiple settings score	47.1	0.54 (0.17 to 0.92)
Intensity of involvement using multiple strategies		
Tobacco control	50.0	0.78 (0.59 to 0.98)
Physical activity	33.3	0.51 (0.13 to 0.89)
Healthy eating	25.0	0.40 (0.09 to 0.71)
Mixed risk factor	37.5	0.40 (0.06 to 0.75)
Multiple strategies score	29.4	0.65 (0.38 to 0.92)

*Nine of 26 pairs of raters rated different organisational units or levels. Analyses are presented for the 17 pairs that rated the same organisational unit/level.
CI, confidence interval; SDH, social determinants of health.

minimum of three items, and that items loading on a given factor shared the same conceptual meaning.⁴² Items that did not fit these criteria were treated as single item measures (n = 8) or dropped (n = 12) if they did not represent a key concept in the conceptual framework.

Cronbach's α ⁴³ and mean inter-item correlations⁴⁴ were computed to measure internal consistency. The range and distribution of individual inter-item correlations were examined to confirm unidimensionality.⁴⁴ Interpretive labels were assigned to each scale.

Factor based scores for each scale were computed only for organisations that had data for at least 50% of scale items. Spearman rank correlation coefficients were computed to describe associations between hypothesised determinants and each of the skills and resources scales of the capacity construct.

PCA based scale construction was not appropriate for two components of the conceptual framework ("resources available for CDP activities" and "intensity of involvement in CDP activities"), either because items selected to measure the component did not share the same response categories or they did not represent one single underlying construct. In both cases, scores were developed using arithmetic combinations of items, aiming to approximate normal distributions. The scoring strategy created two "all risk factor" scores (intensity of involvement (i) multiple settings score or (ii) multiple strategies score). Variations in sample size associated with differences in mandated risk factor programming required creation of an "intensity of involvement score" for each risk factor separately.

Inter-rater reliability coefficients (that is, per cent agreement and weighted κ ⁴⁵) using quadratic (standard) weights, were computed for selected variables.

Data analyses were conducted using SAS software, version 8.2 (SAS Institute, Cary, North Carolina, USA) and SPSS software release 11 (SPSS, Chicago, Illinois). The study was approved by the institutional review board of the Faculty of Medicine of McGill University.

RESULTS

Of the 216 organisations surveyed, 103 regional health authorities/districts and public health units/agencies were within the formal public health system. The remainder included NGOs (n = 54), coalitions, partnerships or alliances (n = 41), and others (government departments, paragovernmental health agencies, professional associations, and so on) (n = 18). Table 1 presents selected characteristics of participating organisations.

Overall, PCA confirmed our conceptualisation of the scales used to measure the components of our conceptual framework. Through PCA, we consolidated 124 individual items into 20 psychometrically sound scales, facilitating analysis and interpretation of these data. The components of our conceptual framework were measured in 32 multi-item scales/scores and 15 single item indicators (table 2). Factor loadings for items in the 20 scales were generally ≥ 0.71 . Cronbach's α values were consistently above 0.64 and mean inter-item Spearman rank correlation coefficients ranged between 0.30 and 0.57, demonstrating good to very good internal consistency. Unidimensionality of scales was confirmed. Most inter-item correlations ranged from 0.20 to 0.70 and within each scale were clustered around their respective means.

Interrater reliability coefficients were low to moderate for the 19 variables tested, with per cent agreement ranging from 12.5% for "intensity of involvement in healthy eating using multiple strategies" to 66.7% for "intensity of involvement in tobacco control across multiple settings" (table 3). Weighted κ coefficients which correct for chance and take partial agreement into consideration were generally less conservative, but nonetheless ranged between 0.11 and 0.78.

Determinants of organisational capacity were weakly or moderately correlated with organisational capacity indicators (table 4). Few statistically significant correlations were observed between organisational capacity indicators and hypothesised structural determinants, with the exception that size of organisation was positively correlated with external

Table 4 Spearman rank correlation coefficients between indicators of organisational capacity and potential determinants of organisational capacity (n=216)

Skills		Indicators of organisational capacity						Resources			Priority for CDP/HLP			
Risk factors		Population needs assessment		Identify relevant practices	Implementation strategies		Evaluation	Adequacy	Stability	External sources				
SDH	Tobacco	Healthy eating	Physical activity		Stress	Planning						Implementation strategies		
Structural determinants														
Age	0.05	0.18**	-0.04	-0.09	0.0	0.16*	-0.04	0.01	0.12	-0.01	0.07	0.02	0.21**	-0.15*
Size of organisation	0.08	0.14*	0.08	-0.15*	0.12	0.17*	0.07	0.04	0.09	0.10	-0.17*	0.0	0.26**	-0.41**
Organisational supports														
Managerial	0.19**	0.14*	0.18**	0.32**	0.12	0.23**	0.36**	0.37**	0.33**	0.36**	0.29**	-0.03	0.02	0.41**
Staff	0.01	0.14*	0.14*	0.16*	0.04	0.15*	0.21**	0.31**	0.18**	0.25**	0.43**	0.16*	0.05	0.36**
Evaluation	0.09	0.20**	0.01	0.07	0.04	0.16*	0.26**	0.45**	0.29**	0.43**	0.29**	0.06	0.18**	0.24**
Partnerships														
Number	0.05	0.20**	0.17*	0.12	0.06	0.09	0.23**	0.16*	0.17*	0.14*	-0.11	-0.04	0.21**	0.0
Effectiveness	0.16*	0.12	0.18**	0.04	0.02	0.18**	0.23**	0.20**	0.21**	0.11	0.25**	-0.05	0.19**	0.19**

*p>0.05; **p>0.01.
CDP/HLP, chronic disease prevention/healthy lifestyle promotion; SDH, social determinants of health.

*p>0.05; **p>0.01.

CDP/HLP, chronic disease prevention/healthy lifestyle promotion; SDH, social determinants of health.

sources of funding ($r_s = 0.26$), and negatively correlated with priority for CDP/HLP ($r_s = -0.41$). Indicators of organisational supports were generally significantly and positively correlated with organisational capacity. Correlations between skills (identification of relevant practices, planning, implementation strategies, and evaluation) and resources (adequacy and priority) ranged between 0.21 and 0.45. Partnerships were also robustly correlated with several indicators of skills and with external sources of funding, but correlations were generally weak, ranging between 0.14 and 0.23.

DISCUSSION

There are major gaps in knowledge on organisational capacity for CDP/HLP,²³ related in part to the lack of a widely accepted, well grounded conceptual model, as well as to the lack of reliable measurement instruments. This paper provides conceptual and empirical clarification of the dimensions, determinants, and outcomes of organisational capacity to undertake CDP/HLP in public health organisations. We propose a series of psychometrically sound measurement instruments using data from the first national survey on levels of organisational capacity and implementation of CDP/HLP activities across Canada, with organisations as the unit of analysis.

Our PCA based scales showed good psychometric properties including very good to excellent internal consistency, as well as evidence of unidimensionality. Interrater reliabilities were generally low for at least two reasons. First, most indicators comprised multiple items (that is, 15–20 items per scale/score) so that the probability of disagreement between raters by chance alone is higher than would be for single item indicators. Second, because organisations are inherently complex, data provided by a single individual may not reliably reflect the characteristics of, and processes within, organisations. Steckler *et al*²⁶ suggested an alternative data collection strategy, namely to solicit a collective response through group interviews or questionnaires. Although possibly more valid, this method may be costly, more difficult to control, and in addition might require a level of organisational commitment that affects response proportions negatively. Another strategy for collecting organisational level data is to interview several respondents within the same organisation and then average their scores. If raters disagree, this strategy may not be more useful than interviewing single respondents as the resulting averages may not represent coherent perspectives.

Although κ_w values were generally low, higher interrater agreement was observed for several measures, notably those related to tobacco control. This could reflect the fact that tobacco control programmes have existed in Canada for over 30 years, whereas public health interventions related to other risk factors such as stress or reducing social disparities are relatively new. The longstanding presence of tobacco control activities may have contributed to more consistent perceptions between respondents within the same organisation about the nature of such activities.

Our results uphold our conceptual model, in terms both of its delineation of variables and of the relation between these variables. Factors related to organisational supports were moderately related to capacity. These factors represent ways in which organisations provide information, staff, and professional development opportunities for CDP/HLP, use monitoring and evaluation in decisions about CDP/HLP programming, and provide leadership and commitment for CDP/HLP. Riley *et al*²² observed that internal organisational factors (similar to our support factors) were indirectly related to implementation of heart health promotion activities through their effect on capacity. Partnership related variables might also be important in understanding organisational capacity. Whereas partner-

ships were once viewed as an option for public health organisations, they are now increasingly seen as necessary to respond to the chronic disease burden. Partnerships can create mechanisms for public health organisations with limited financial resources to increase knowledge, resources, and skills.^{47 48}

Limitations of this study include the fact that data were collected from only one respondent within each organisation, albeit a respondent carefully selected as most knowledgeable about CDP/HLP. As all measures were collected from the same respondent, correlations between measures may result from artefactual covariance rather than substantive differences.⁴⁹ However, most measures were not highly correlated, suggesting that this may not be a problem. Ideally, organisational level constructs should be assessed using objective measures, but self report is the most common method of data collection in organisational research. While we investigated content validity and both internal and interrater reliability of our measures, we could not examine criterion related validity because there are no gold standard measures of the indicators of interest. While cross sectional data can generate hypotheses about the relations between variables in our conceptual model, longitudinal data are needed to investigate whether these associations might be causal.

In summary, we propose several tools to facilitate systematic investigation of organisational capacity within public health systems. Based on an integrative conceptual model for research

on organisational capacity, we developed conceptually and psychometrically sound measures of organisational capacity for CDP/HLP to support evidence based decision making and investment in preventive health systems.

ACKNOWLEDGEMENTS

We wish to acknowledge provincial contacts for their participation in creating the comprehensive list of organisations/senior managers and for their input regarding questionnaire development. We also express our appreciation to the pilot and study organisations and to Garbis Meshefedjian and Dexter Harvey for their contributions.

Authors' affiliations

Nancy Hanusaik, Department of Epidemiology, Biostatistics and Occupational Health, Faculty of Medicine, McGill University, Montréal, Québec, Canada

Jennifer L O'Loughlin, Department of Social and Preventive Medicine, University of Montreal, Montréal, Québec, Canada; Centre de recherche de Centre hospitalier de l'Université de Montréal; Institut national de santé publique du Québec, Montréal

Natalie Kishchuk, Natalie Kishchuk Evaluation & Research Inc, Kirkland, Québec, Canada

John Eyles, Kerry Robinson, School of Geography and Earth Sciences, McMaster University, Hamilton, Ontario, Canada

Roy Cameron, Department of Health Sciences and Gerontology, University of Waterloo, Waterloo, Ontario, Canada; Centre for Behavioural Research and Program Evaluation, University of Waterloo

Funding: This research is supported by a grant from the Canadian Institutes of Health Research (CIHR). Nancy Hanusaik is the recipient of a CIHR Fellowship and was initially funded by training awards from the Fonds de la recherche en santé (FRSQ) and the Transdisciplinary Training Program in Public and Population Health (Quebec Population Health Research Network and CIHR).

Competing interests: None.

REFERENCES

- 1 **Statistics Canada**. *Statistical report on the health of Canadians*, Catalogue No 82-570-XIE. Ottawa: Ministry of Public Works and Government Services, 1999.
- 2 **Health Canada**. *Economic burden of illness in Canada, 1998*, Catalogue No H21-136/1998E. Ottawa: Ministry of Public Works and Government Services, 2002.
- 3 **World Health Organisation**. *Preventing chronic diseases: a vital investment*. Geneva: WHO, 2005.
- 4 **Winkleby MA, Feldman HA, Murray DM**. Joint analysis of three US community intervention trials for reduction of cardiovascular disease risk. *J Clin Epidemiol* 1997;**50**:645-58.
- 5 **Pearson TA, Bales VS, Blair L, et al**. The Singapore Declaration: forging the will for heart health in the next millennium. *CVD Prevention* 1998;**1**:182-99.
- 6 **Raphael D, Steinmetz B**. Assessing the knowledge and skills of community-based health promoters. *Health Promot Int* 1995;**10**:305-15.
- 7 **Jackson C, Fortmann SP, Flora JA, et al**. The capacity-building approach to intervention maintenance implemented by the Stanford Five-City Project. *Health Educ Res* 1994;**9**:385-96.
- 8 **Goodman R, Speers M, McLeroy K, et al**. Identifying and defining the dimensions of community capacity to provide a basis for measurement. *Health Educ Behav* 1998;**25**:258-78.
- 9 **Hawe P, Noort M, King L, et al**. Multiplying health gains: the critical role of capacity building within health promotion programs. *Health Policy* 1997;**39**:29-42.
- 10 **Goodman RM, Steckler A, Alciati MH**. A process evaluation of the National Cancer Institute's data-based intervention research program: a study of organizational capacity building. *Health Educ Res* 1997;**12**:181-97.
- 11 **Crisp B, Swerissen H, Duckett S**. Four approaches to capacity building in health: consequences for measurement and accountability. *Health Promot Int* 2000;**15**:99-107.
- 12 **Labonte R, Laverack G**. Capacity building for health promotion. Part 1. For whom? And for what purpose? *Crit Public Health* 2001;**11**:111-27.
- 13 **Labonte R, Laverack G**. Capacity building for health promotion. Part 2. Whose use? And with what measurement? *Crit Public Health* 2001;**11**:129-38.
- 14 **Germann K, Wilson D**. Organizational capacity for community development in regional health authorities: a conceptual model. *Health Promot Int* 2004;**19**:289-98.
- 15 **Hawe P, King L, Noort M, et al**. *Indicators to help with capacity-building in health promotion*. North Sydney: NSW Health Department, 1999.
- 16 **Taylor SM, Elliott S, Riley B**. Heart health promotion: predisposition, capacity and implementation in Ontario public health units, 1994-96. *Can J Public Health* 1998;**89**:410-14.

What is already known

- There are major gaps in our knowledge of the capacity of public health organisations to undertake community based chronic disease prevention/healthy lifestyle promotion programming
- Researchers encounter three challenges: lack of a widely accepted conceptual model designed to enhance empirical testing of associations between organisational capacity, its hypothesised determinants, and outcomes; lack of validated, quantitative measurement instruments of organisational capacity, its determinants, and outcomes; and no nationally representative data on levels of organisational capacity.

What this paper adds

- We propose a series of psychometrically sound measurement instruments using data from the first national survey on levels of organisational capacity and implementation of CDP/HLP activities across Canada with organisations as the unit of analysis.

Policy implications

- Tools to facilitate systematic investigation of organisational capacity within public health systems are needed to support evidence based decision making and investment in chronic disease prevention.

- 17 Heath S, Farquharson J, MacLean D, *et al.* Capacity-building for health promotion and chronic disease prevention – Nova Scotia's experience. *Promot Educ* 2001;(suppl 1):17–22.
- 18 McLean S, Ebbesen L, Green K, *et al.* Capacity for community development: an approach to conceptualization and measurement. *J Community Dev Soc* 2001;32:251–70.
- 19 Smith C, Raine K, Anderson D, *et al.* A preliminary examination of organizational capacity for heart health promotion in Alberta's regional health authorities. *Promot Educ* 2001;(suppl 1):40–43.
- 20 Naylor P, Wharf-Higgins J, O'Connor B, *et al.* Enhancing capacity for cardiovascular disease prevention: an overview of the British Columbia heart health dissemination project. *Promot Educ* 2001;(suppl 1):44–48.
- 21 Elliott S, Taylor S, Cameron S, *et al.* Assessing public health capacity to support community-based heart health promotion: the Canadian heart health initiative, Ontario Project (CHHIOP). *Health Educ Res* 1998;13:607–22.
- 22 Riley B, Taylor M, Elliott S. Determinants of implementing heart health promotion activities in Ontario public health units: a social ecological perspective. *Health Educ Res* 2001;16:425–41.
- 23 Ebbesen L, Heath S, Naylor P, *et al.* Issues in measuring health promotion capacity in Canada: a multi-province perspective. *Health Promot Int* 2004;19:85–94.
- 24 Anderson D, Plotnikoff R, Raine K, *et al.* Towards the development of scales to measure "will" to promote health heart within health organizations in Canada. *Health Promot Int* 2004;19:471–81.
- 25 Barrett L, Plotnikoff R, Raine K, *et al.* Development of measures of organizational leadership for health promotion. *Health Educ Behav* 2005;32:195–207.
- 26 Canadian Heart Health Initiative – Ontario Project (CHHIOP). Survey of capacities, activities, and needs for promoting heart health, 1997.
- 27 Saskatchewan Heart Health Program. *Health promotion contact profile*. Saskatoon: University of Saskatchewan, 1998.
- 28 Lusthaus C, Adrien M-H, Anderson G, *et al.* *Enhancing organizational performance: a toolbox for self-assessment*. Ottawa: International Development Research Centre, 1999.
- 29 Alberta Heart Health Project. *Health promotion capacity survey*. Edmonton: University of Alberta, 2000.
- 30 Alberta Heart Health Project. *Health promotion individual capacity survey: self-assessment*. Edmonton: University of Alberta, 2001.
- 31 Alberta Heart Health Project. *Health promotion organizational capacity survey: self-assessment*. Edmonton: University of Alberta, 2001.
- 32 British Columbia Heart Health Project (BCHHP). *Revised activity scan*. Vancouver: HeartBC, 2001.
- 33 Nathan S, Rotem S, Ritchie J. Closing the gap: building the capacity of non-government organizations as advocates for health equity. *Health Promot Int* 2002;17:69–78.
- 34 Ontario Heart Health Project. Survey of public health units, 2003.
- 35 Heart Health Nova Scotia. Measuring organizational capacity for heart health promotion: SCAN of community agencies. Halifax: Dalhousie University, 1996.
- 36 Heart Health Nova Scotia. Capacity for heart health promotion questionnaire – organizational practices. Halifax: Dalhousie University, 1998.
- 37 Valleraud RJ. Toward a methodology for the transcultural validation of psychological questionnaires: implications for research in the French language. *Can Psychol* 1989;30:662–80.
- 38 Guillemin F, Bombardier C, Beaton D. Cross-cultural adaptation of health-related quality of life measures: literature review and proposed guidelines. *J Clin Epidemiol* 1993;46:1417–32.
- 39 Tabachnick BG, Fidell LS. *Using multivariate statistics*. Boston: Allyn and Bacon, 2001.
- 40 Cattell RB. The Scree test for the number of factors. *Multivariate Behav Res* 1966;1:245–76.
- 41 Streiner DL. Figuring out factors: the use and misuse of factor analysis. *Can J Psychiatry* 1994;39:135–40.
- 42 Hatcher L, Stepanski EJ. *A step-by-step approach to using the SAS system for univariate and multivariate statistics*. Cary, NC: SAS Institute, 1994.
- 43 Cronbach LJ. Coefficient alpha and the internal structure of tests. *Psychometrika* 1951;16:297–334.
- 44 Clark LA, Watson D. Constructing validity: basic issues in objective scale development. *Psychol Assess* 1995;7:309–19.
- 45 Cohen J. Weighted kappa: nominal scale agreement with provision for scaled agreement or partial credit. *Psychol Bull* 1968;70:213–20.
- 46 Sieckler A, Goodman RM, Alciati MH. Collecting and analyzing organizational level data for health behaviour research (editorial). *Health Educ Res* 1997;12: i–iii.
- 47 Reich MR. Public-private partnerships for public health. *Nat Med* 2000;6:617–20.
- 48 Gordon WA, Brown M. Building research capacity: the role of partnerships. *Am J Phys Med Rehabil* 2005;84:999–1004.
- 49 Podsakoff PM, Organ DW. Self-reports in organizational research: problems and prospects. *J Manage* 1986;12:531–44.

Submit an eLetter, and join the debate

eLetters are a fast and convenient way to register your opinion on topical and contentious medical issues. You can find the "submit a response" link alongside the abstract, full text and PDF versions of all our articles. We aim to publish swiftly, and your comments will be emailed directly to the author of the original article to allow them to respond. eLetters are a great way of participating in important clinical debates, so make sure your voice is heard.

APPENDIX 12

 You forwarded this message on 10/24/2008 11:09 AM.

Nancy Anna Hanusaik, Ms

From: Liz Standing [LStanding@bmj.com]
To: Nancy Hanusaik
Cc: bmjpermissions1@bmjgroup.com
Subject: Re: Copyright Waiver Required
Attachments:

Sent: Fri 10/24/2008 11:05 AM

Dear Nancy

The BMJ Publishing Group grants permission for the material requested below (JECH, 2007, issue 61, pages 742-749) to be reproduced in the work detailed below (your thesis).

Permission is for this instance only and not for future editions of your work. Separate applications should be made for future usage.

Permission applies for the English language only as multiple languages are considered separately.

Please note the following conditions:

The copyright of all material specified remains with the BMJ Publishing Group, and permission for reproduction is limited to the formats and products listed above. The text may not be altered in any way without the express permission of the copyright owners.

Acknowledgement to the publication should be made adjacent to the reproduced material ie, Journal name, year, volume, page numbers; reproduced with permission from the BMJ Publishing Group.

Yours sincerely

Liz Standing
 Permissions Administrator
 BMJ Journals
 BMJ Publishing Group Limited

"Nancy Anna Hanusaik, Ms"
 <nancy.hanusaik@mcgill.ca>

To <jech@bmjgroup.com>

cc

Subject Copyright Waiver Required

21/10/2008 14:49

Good Morning,

I am the first author on an article published in JECH, 2007, issue 61, pages 742-749. I am in the process of submitting the final version of my doctoral thesis which is manuscript-based and the university requires that all published articles that are a part of theses have copyright waivers from the publisher. This can be emailed or faxed. Prior to my initial submission, I wrote to JECH and was directed

to complete a permissions request form on the BMJ Group Website. I was subsequently directed to the FAQs page which I downloaded. This page makes reference to the fact that I am able to reproduce my article in a book that I have written. I included this page in my thesis but was told that for final submission this would be insufficient and I absolutely require a specific release. Can you please help me obtain the necessary signed waiver?

Nancy Hanusaik, PDt, MSc, Doctoral Candidate
McGill University
Dept Epidemiology, Biostatistics & Occupational Health
1020 Pine Avenue West
Montreal, Quebec H3A 1A2
Tel. No.: 1-514-890-8000 ext 15858
Fax No.: 1-514-412-7137
email: nancy.hanusaik@mail.mcgill.ca

This email has been scanned by the MessageLabs Email Security System.
For more information please visit <http://www.messagelabs.com/email>

ForwardSourceID:NT00042696

The BMJ Group is one of the world's most trusted providers of medical information for doctors, researchers, health care workers and patients www.bmjgroup.bmj.com. This email and any attachments are confidential. If you have received this email in error, please delete it and kindly notify us. If the email contains personal views then the BMJ Group accepts no responsibility for these statements. The recipient should check this email and attachments for viruses because the BMJ Group accepts no liability for any damage caused by viruses. Emails sent or received by the BMJ Group may be monitored for size, traffic, distribution and content. BMJ Publishing Group Limited trading as BMJ Group. A private limited company, registered in England and Wales under registration number 03102371. Registered office: BMA House, Tavistock Square, London WC1H 9JR, UK.

RELEASE FORM

MANUSCRIPT-BASED THESIS

(A) PUBLISHED MANUSCRIPTS

MANUSCRIPT #1

Title: Building the backbone for organizational research in public health systems: development of measures of organizational capacity for chronic disease prevention.

Authors: Nancy Hanusaik, Jennifer O'Loughlin, Natalie Kishchuk, John Eyles, Kerry Robinson, Roy Cameron.

Publisher: BMJ Publishing Group Ltd.

(B) UNPUBLISHED MANUSCRIPTS

MANUSCRIPT #2

Title: Organizational capacity for chronic disease prevention in Canada: Results of a national survey

Authors: Nancy Hanusaik, Jennifer O'Loughlin, Natalie Kishchuk, Gilles Paradis, Roy Cameron

MANUSCRIPT #3

Title: A national survey of dissemination practices in chronic disease prevention organizations in Canada

Authors: Nancy Hanusaik, Jennifer O'Loughlin, Gilles Paradis, Natalie Kishchuk

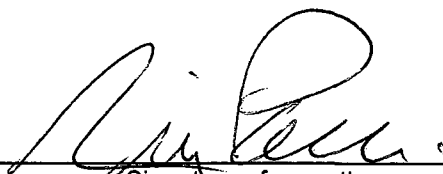
I give permission to be included as a co-author of manuscript(s) that are within the thesis:

1) 
Signature of co-author

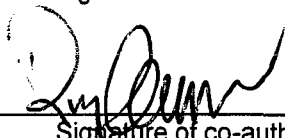
Jennifer O'Loughlin, PhD
Typed name of co-author

2) 
Signature of co-author

Natalie Kishchuk, PhD
Typed name of co-author

3) 
Signature of co-author

Gilles Paradis, MD, MSc, FRCP
Typed name of co-author

4) 
Signature of co-author

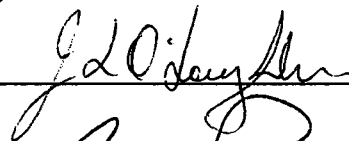
Roy Cameron, PhD
Typed name of co-author

This represents an accurate count of **all** authors and **all** manuscripts included in the thesis.

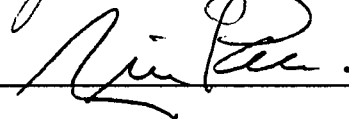
Signature of Student:



Signature of Thesis Supervisor:



Signature of Thesis Co-Supervisor:



Date: 2008-05-30