

**An Assessment of the Methods and Concepts
Used to Synthesize the Evidence
of Effectiveness in Health Promotion:
A Review of 17 Initiatives**

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The opinions expressed in this report are those of the authors and
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EXECUTIVE SUMMARY

One of the major tools used by decision-makers and practitioners in planning programs, policies and investment decisions is the systematic review of existing evidence of effectiveness. This paper is an overview of the procedures and concepts behind seventeen synthesis or review initiatives which look at the evidence of effectiveness or cost-effectiveness related to health promotion topics or interventions. Specifically, these 17 existing synthesis and systematic review initiatives were reviewed in terms of how they addressed the challenges posed by the health promotion field at each step of a synthesis process. This is NOT a summary of all of the existing information relevant to the effectiveness of health promotion topics or interventions.

Some of the key challenges presented by the health promotion field are a focus on populations and communities more than individuals, a focus on combinations of strategies rather than single interventions, a focus on involving community members in program design and evaluation, a focus on health promotion theories and beliefs, and the use of qualitative as well as quantitative approaches to research and evaluation. The steps of a synthesis process are (a) identification of the studies to be screened, (b) selection of the studies, (c) analysis of the studies selected, (d) synthesis, and (e) report-writing. For each step, the concepts and processes used by each review initiative were assessed in relation to the key challenges or features of health promotion.

At the ‘**identification** of studies to be screened’ stage of a synthesis process, most initiatives were limited with respect to health promotion because they searched only English language literature, used MEDLINE as their database, and did not use health promotion theories to guide their process. The use of outside experts to inform the scope and approach of most reviews could be seen as an opportunity to increase the influence of health promotion/population health expertise. When **selecting** studies for further review and synthesis, almost all initiatives used randomized controlled trials (RCTs) as their preferred selection criteria for quality of study design, although alternative criteria were also used. Reviewers usually judged the effectiveness of studies based on the quality of their research design, although there are many other factors that are important in health promotion (e.g. setting, incorporation of values, use of multiple strategies etc.). Only four initiatives were true **syntheses**¹ of evidence — the remainder

¹ In a synthesis, the results of several studies are combined, either quantitatively or qualitatively to draw conclusions about the effectiveness of a class, type or defining feature of an intervention (quantitative “meta-analysis” is one method of synthesis).

were summaries or annotated literature reviews. At the **report-writing** phase of the synthesis process, many initiatives used a variety of user-friendly formats to disseminate their results, used common formats, and discussed the implications for policy and decision-makers.

The initiatives demonstrated many possible ways to incorporate theory into the review process, to be comprehensive in screening of studies, and to produce user-friendly reports with a greater potential for policy and program impact. The major gaps in the existing initiatives from a health promotion perspective were in the selection, analysis and synthesis steps of the synthesis process. Health promotion requires the inclusion criteria to be broad, quality evidence criteria that include more than quality of study design, a complex analysis and integration of research designs process, a quality assessment protocol that includes both quantitative and qualitative studies, and a synthesis protocol for qualitative studies.

Two economic evaluation summary initiatives were reviewed from a health promotion/population health perspective. A preliminary view of the biggest challenges faced by economic evaluators in this field are (a) their reliance on standard study design and effectiveness criteria that were critiqued above, (b) the lack of economic evaluations that have been conducted in health promotion, (c) economic evaluations in health are usually done for individually-oriented clinical interventions and are applied less often to broader social and political interventions; (d) similar issues around integrating studies and incorporating broad health promotion characteristics to those mentioned for the other initiatives (e.g. using multiple strategies, qualitative outcomes etc.).

An ideal health promotion synthesis approach and framework is proposed. The role of written guidelines and a synthesis team were described for each step of a synthesis process and gaps were identified between what exists currently and the ideal. Reviews produced by the US Guide to Community Preventive Services, the Cochrane Collaboration, and the National Health Service Centre for Reviews and Dissemination in the UK initiatives were suggested as places to turn for policy advice about evidence of effectiveness in the interim.

In conclusion, there are good examples of guidelines and processes from the existing synthesis initiatives around overall approach, screening and identification of studies and report-writing. There are major gaps in what is needed to select studies, analyze and synthesize them. It was suggested that a new synthesis framework or set of written procedures be developed and that there be more investments in research and evaluation of health promotion initiatives in order to increase and evolve the evidence base. The implementation of this ideal framework would significantly increase the confidence of health promotion practitioners and policy-makers in using the results of such reviews and their willingness to contribute to the database.

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I. INTRODUCTION

The health promotion and population health field, together with other fields (e.g. medicine, education, social services), is being pressured to justify its practice on the basis of evidence. The demand for evidence is found at many levels: (a) by practitioners at all levels of practice who are preparing operational plans and who want to use effective interventions, (b) by local managers who have to make strategic decisions about which programs to support, and (c) by senior managers within organizations and governments who want guidance for priority-setting, policy and funding decisions to support improved health outcomes.

One of the tools used by decision-makers at all levels is the systematic review of existing evidence. A group or organization conducts a review of the literature on a topic of interest and summarizes or synthesizes the results of many studies to provide a statement of the ‘evidence’ of the effectiveness of selected interventions. Although there are many systematic review initiatives internationally, several of which have focused specifically on health promotion and population health topics and interventions, they are all dependent on the quality and type of research and evaluation conducted. In addition, syntheses and reviews in the health promotion field face particular challenges created by the nature of the field. These include a focus on participatory processes of research and community development, an emphasis on values, a focus on populations rather than individuals, the use of multiple strategies, collaboration across sectors, an emphasis on processes as well as outcomes, and the complexity and long-term nature of health promotion interventions and outcomes.

This project is an overview of various frameworks (i.e. methods and concepts) used to synthesize the evidence of effectiveness, and to a lesser extent the cost-effectiveness, of health promotion interventions. It does not attempt to answer the question “how effective is health promotion?” The specific objectives were to critically review the frameworks employed in reviewing/synthesizing the evidence related to the effectiveness, with particular attention given to how the challenges created by the nature of the health promotion field were addressed; and to analyze learnings, and identify implications for research and a systematic approach to building evidence.

Health promotion emphasizes the process of enabling people to control their health and is a key upstream strategy to improve population health status and address inequalities. In general, health promotion studies have features which are different from most medical or clinical studies and which are in common with other social sciences fields. Yet it is the systematic review methods designed for medical and clinical studies that have been applied to health promotion. Our premise is that health promotion studies have been inappropriately assessed for evidence of effectiveness using medical or clinical criteria in the synthesis or systematic review process. We

believe that the steps of the synthesis process are sound but that different criteria of evidence perhaps suited to the social sciences are more appropriate to assess health promotion interventions. The key features which distinguish health promotion are listed in Table 1 along with the implications for conducting a synthesis. Our analysis focuses on the integration of these features in the systematic review process.

Table 1. The Role of Key Health Promotion Characteristics in Conducting Syntheses of Evidence of Effectiveness

Key Characteristics of Health Promotion	Implications of Health Promotion Characteristics for Conducting Syntheses
focus on short-term and intermediate term outcomes as well as long-term outcomes	Studies that focus on short-term and intermediate outcomes need to be included
focus on processes as well as outcomes	Implementation and process evaluations need to be included.
focus on populations and communities more than individuals	Most of the criteria for judging quality of research/evaluation studies have been developed from clinical trials of individuals rather than population studies. This feature requires outcome measures for populations and communities and methodology quality criteria that are appropriate to populations.
focus on combinations of strategies rather than single interventions	A combination of strategies requires complex meta-analytic procedures.
many disciplines and sectors involved	No one discipline's methods can be used. The standards and methods of the social sciences contribute to the selection criteria and to the analysis and synthesis steps. Members of several disciplines need to sit on project advisory committees.
focus on determinants of health and their interactions (e.g. social, economic & physical environments)	At the screening phase, reviewers could determine whether projects incorporated any determinants of health (see Alberta or Health Forum initiatives as examples). Determinants of health could also be categories in the analysis or synthesis phases and the report-writing.
focus on involving clients or community members in designing appropriate interventions and in research and evaluation processes	Action research and participatory action research are considered appropriate approaches in health promotion. Inclusion criteria need to be broadened and the judgements of quality of acceptable evidence need to include a range of participatory action research studies.
use of qualitative as well as quantitative approaches to research and evaluation	Qualitative and quantitative studies need to be included, quality protocols need to be developed for assessing qualitative studies and evidence, qualitative synthesis protocols need to be created.

focus on health promotion theories & beliefs that are manifested at multiple levels of every project (e.g. health is positive, holistic, and multi-level, Kahan & Goodstadt, 2001)	Health promotion theories and beliefs need to inform the framework elements associated with analysis, synthesis, and report-writing — setting up models for measuring short and long term outcomes, conditions of success, logic models, and appropriate processes
focus on health promotion values (optimal health for all, social justice, power-sharing, ecological respect & sensitivity, enrichment of individual and community life--see Kahan & Goodstadt, 2001)	These health promotion values could be explicitly used as analysis, synthesis and report-writing categories.
connected to political and social processes at community and other government levels (with a strong emphasis on building healthy public policy and advocacy strategies)	Setting, context and conditions for political and social success of health promotion need to be included as part of the descriptive analysis categories, outcomes and report-writing. The social environments associated with the studies/evidence included in the synthesis need to be detailed — thereby allowing the readers to determine whether the results are applicable to their communities.

II. METHODS

The project staff reviewed and analyzed a sample of 17 existing Canadian and international synthesis initiatives on effectiveness and cost-effectiveness of health promotion interventions (see next page and Appendix A). The initiatives selected for review in this project were major reviews of the literature related to health promotion and population health interventions that were known to the members of the Canadian Consortium for Health Promotion Research. The reviews included true syntheses, annotated bibliographies, summaries, and their review protocols or procedures. Care was taken to include Canadian review initiatives as well as internationally acclaimed initiatives. Initiatives focused on one topic or intervention were not included (the exception is the International Best Practices in Heart Health). Those selected for this study included:

- (a) **Updated Systematic Review Databases** (internationally acclaimed systematic review databases that are readily accessible, continuously updated and that have health promotion reviews as part of a larger system of reviews):
 - Cochrane Collaboration (Cochrane)²
 - National Health Service Centre for Reviews and Dissemination (NHS-CRD, UK);
- (b) **Systematic Review Series on Selected Topics** (series of reviews of selected topics conducted over several years that focus on or include reviews of health promotion topics):
 - US Guide to Community Preventive Services (US Guide),

² Brackets denote the abbreviations that will be used to refer to each initiative for the remainder of the report.

- Public Health Division of the Department of Human Services in Victoria, Australia
- Evidence for Policy and Practice Information Coordinating Centre in UK (EPPI)
- Overviews of research literature by Central West Health Planning Information Network (CWHPIN- Ontario)
- Public Health Research Education and Development program reviews (PHRED, Ontario);

(c) **One-time-only summary reviews** (one publication with chapters that summarize or synthesize the literature on topics that have relevance to health promotion):

- International Union for Health Promotion and Education 1994 (IUHPE 94),
- International Union for Health Promotion and Education 1999 report “The Evidence of Health Promotion Effectiveness,” (IUHPE 99)
- International Best Practices in Heart Health 1998 (Heart Health -- Ontario);

(d) **Project or event-specific Reviews** (health promotion-specific one-time-only reviews produced for a project or in relation to a specific event):

- National Forum on Health 1998 (Natl Forum -- Canadian),
- Health Promotion Effectiveness in Alberta (Alberta),
- 1996 Centre for Health Promotion Symposium on Effectiveness of Health Promotion (CHP);

(e) **Proposed Frameworks** (proposed frameworks or guidelines for conducting reviews that have features relevant to health promotion):

- Campbell Collaboration proposal (Campbell)
- Kahan and Goodstadt’s “Best Practices in Health Promotion Framework to Assess Reviews or Syntheses”. (Ontario)

(f) **Economic Evaluations** (examples of a database and a summary review with relevance to health promotion):

- National Health Service Economic Evaluations Database (NHS-EED, UK)
- “An Ounce of Prevention. . . . What are the Returns?” of the Centres for Disease Control and Prevention of the US Department of Health and Human Services (CDC)

The websites, purpose, clients and key features associated with each reviewed initiative are listed in Appendix A.

The project’s review process was divided into five phases (details about the methods used in each phase are described in Appendix B.):

- Phase 1 — Description of key features of each initiative in relation to each stage of a systematic review or synthesis. The stages are:
- * Identification of studies to be screened
 - * Selection of studies
 - * Analysis of studies
 - * Synthesis of studies

* Reporting results

- Phase 2 — Comparison of similarities and differences of initiatives in relation to specific characteristics of health promotion as applied to each stage of a systematic review or synthesis
- Phase 3 — Identification of challenges and gaps to the conduct of syntheses from a health promotion perspective
- Phase 4 — Interviews with/survey of key informants linked to specific initiatives about the strengths and weaknesses of their initiatives, lessons learned, policy impacts and outstanding issues.
- Phase 5 — Identification of a set of procedures for conducting syntheses in health promotion, development of an ideal model or framework, and discussion of implications for policy-makers related to building and using the evidence base.

A Project Advisory Committee with members of the Canadian Consortium for Health Promotion Research provided advice at the beginning of the project, at the project's mid-point, and as the final report was developed (see Appendix C).

III. RESULTS -- ASSESSMENT OF EXISTING SYNTHESIS FRAMEWORKS

A. Key Features, Similarities and Differences of Initiatives

For our analysis, we developed specific questions for each stage of a systematic review process based on the key features of a health promotion approach (as presented in Table 1, above). The following paragraphs describe the similarities and differences among the 17 synthesis initiatives for each step of conducting a synthesis.

1. Identification of Studies to be Screened — Similarities and Differences

* *Most initiatives searched only English literature.*

Since the field of health promotion practice and research is international in scope, focusing only on studies in English will exclude significant information regarding the effectiveness of health promotion (e.g. from Central and South America).

Eight of the initiatives reviewed were unclear about their language guidelines, six specified English only (Heart Health, CHP, US Guide, PHRED, Alberta, CDC), two accepted all languages (Cochrane and Campbell), and one specified English and French (CWHPIN).

Identification of Studies to be Screened
<ul style="list-style-type: none">* Most initiatives searched only English literature* MEDLINE was the most common database* Outside experts played some role in informing the scope and approach of most reviews* A few initiatives used health promotion theories to guide their review process

** MEDLINE was the most common database.*

Of all the databases available for searching, MEDLINE was the most popular database used for conducting the initial literature searches (used explicitly by 6 initiatives). Five initiatives used a variety of databases depending on the topic and requirements of the search and two did not use electronic databases as their primary source of studies (Heart Health used heart health experts to identify outstanding studies and contact people, and Alberta Evaluation Project used a list of Alberta programs which had formal written reports). The EPPI-Centre, PHRED and IUHPE 1994 used other electronic databases as part of their search strategy, including the Social Sciences Citation Index -- indicating for these initiatives some sensitivity to the importance of social science literature.

** Experts played some role in informing the scope and approach of most reviews.*

Involving experts in the screening process can influence the direction of the review from the beginning and can provide a way to resolve issues and problems as they arise. Most synthesis initiatives have project staff who possess considerable expertise and frequently collaborate or contract with other experts in conducting the synthesis. In five initiatives, experts from outside the organization or agency conducting the review played a primary role in defining the approach of the synthesis and establishing screening criteria for identifying studies to be reviewed — namely, Cochrane, IUHPE 1994, CHP 1996 Symposium, and NHS-CRD. Experts played some role in defining the approach to identifying studies for inclusion, usually within project parameters set by staff or project leaders, in the Victoria, Heart Health, National Forum, US Guide, IUHPE 1999 and Campbell initiatives. Project staff defined and carried out the selection of literature in Ounce of Prevention, NHSEED, Alberta, PHRED, and CWHPIN initiatives. The role of experts was unclear in the EPPI-Centre initiative. The involvement of experts at this initial step is an important opportunity for health promotion expertise to be part of the process.

** A few initiatives used health promotion theories to guide their review process.*

If theories or conceptual frameworks are explicitly stated at the identification stage of a synthesis, they can influence which studies are included. Six initiatives used theories to guide their review process. Several initiatives used explicit health promotion theories (e.g. CHP 1996 Symposium, Alberta, Kahan and Goodstadt proposal). Other initiatives used health and health promotion-related theories to create logic models (US Guide), focus on hypothesis-testing (NHS-CRD), or define a best practices framework (Victoria).

2. Selection of Studies — Similarities and Differences

** Although RCTs represented the preferred selection criteria for most initiatives, alternative criteria were also used.*

Selection of Studies

- * Although RCTs represented the preferred selection criteria for most initiatives, alternative criteria were also used
- * IUHPE 94 looked for evaluations for innovative interventions
- * US Guide searched for economic evaluations for those interventions considered effective

Much of the difficulty the health promotion field faces in conducting a systematic review focuses on the “rigour” of the study/evidence selection criteria. Randomized controlled trials (RCTs) and/or use of comparison groups were identified as prerequisite selection criteria by Cochrane, Victoria, IUHPE 1994, Heart Health, US Guide, NHS-CRD, and EPPI-Centre. In the absence of RCTs, initiatives that preferred RCTs were willing to accept the best alternative standard of evidence available--for example the use of comparison groups. Other alternative selection criteria included quality of evaluation design in projects which strongly met health promotion principles (Alberta), randomized field trials (Campbell), and formally evaluated programs (National Forum). Two review initiatives did not specify inclusion criteria based on methodology (CHP 1996 Symposium, Kahan and Goodstadt). NHS-CRD stated that the evidence standard depended on the focus of the question and that the weakest study design accepted had to be explicit; CWHPIN did not grade the quality of the studies in its reviews; and PHRED included studies that met at least four of nine quality assessment criteria employed by Sackett et al. (1991).

There were two areas where initiatives were unique in their approach to selecting studies for inclusion. IUHPE 1994 looked explicitly for the evaluation of innovative intervention methods, and the US Guide conducted a systematic search for economic evaluations (cost-effectiveness information) for interventions deemed to be effective.

3. Analysis of Studies — Similarities and Differences

* *The most common descriptive categories were “outcome,” “intervention,” “target population.”*
 In the analysis phase of a review, each initiative created descriptive categories for the information reported by each study being reviewed. Most reviews were systematic about requiring their reviewers to use the categories for analysis described in their guidelines. The particular key words selected for the chart presented below represent areas of interest in health promotion and population health. In the key category of “outcome,” intermediate or process outcomes (i.e. not only health outcomes) were presented by Victoria, and IUHPE 1999.

Analysis of Studies

- * The most common descriptive categories were ‘outcome’, ‘intervention’, and ‘target population’
- * Reviewers usually judged studies in terms of quality of research design or effectiveness of the intervention

Common Descriptive Categories for Analysis of Studies	Number of Review Initiatives Which Use This Categorization
“Outcome”	9 Initiatives
“Interventions” or “Strategies”	7 Initiatives

“Target population”	5 Initiatives
“Settings”	3 Initiatives
“Relevant economic aspects”	3 Initiatives
“participants”	Cochrane Initiative
“risk & protective factors”	Victoria Initiative

* Reviewers usually judged studies in terms of quality of research design or effectiveness of the intervention

In addition to the descriptive categories, each initiative required their reviewers to apply some judgement or assessment to the studies. These judgement categories were usually related to an assessment of quality of the study design (e.g. good, fair, poor or adequate, unclear, inadequate) or effectiveness of the intervention (e.g. positive, non-significant, negative or works well, works, may work, does not work). The initiatives which assessed studies in terms of quality were Cochrane, US Guide, NHS-CRD, PHRED, and Alberta. Review initiatives which focused on categorizing studies by effectiveness were Victoria, IUHPE 1994, IUHPE 1999, Heart Health, EPPI-Centre, and CWHPIN.

4. Synthesis of Studies — Similarities and Differences

* Few initiatives were true syntheses; the remainder were summaries or literature reviews.

In a synthesis, the results of several studies are combined, either quantitatively or qualitatively to draw conclusions about the effectiveness of a class, type or defining feature of an intervention. Only four initiatives identified their work as syntheses (see chart below). The remaining initiatives were either summaries or annotated abstracts. Annotated abstracts summarize key features of each document reviewed and list this information for each document. A summary will list the key conclusions of each document in common categories or intervention features. The Alberta initiative assessed its exemplary programs against a set of *a priori*, theoretically derived criteria (not a synthesis).

Synthesis of Studies

- * Few initiatives were true syntheses; the remainder were summaries or literature reviews
- * Syntheses preferred to weight their studies by methodological quality

Type of Synthesis or Review	Initiatives*
Synthesis	Cochrane, Victoria, NHS-CRD, Campbell

Annotated abstracts or literature reviews	CHP, National Forum, EPPI-Centre, CWHPIN, NHSEED, Heart Health
Summary of information collected and not a combination of study results	IUHPE 94, IUHPE 99, US Guide, PHRED, Alberta, Ounce of Prev (CDC)

* Kahan and Goodstadt framework was not included because it was unclear which type of synthesis or review it was in the absence of completed reviews.

** Quantitative methods of synthesis (e.g. meta-analysis) were emphasized although there was openness to other methods.*

The emphasis on quantitative methods in current systematic synthesis methodologies (e.g. meta-analysis) poses a challenge for the synthesis of health promotion studies, which are more likely to employ qualitative research methods. Of the syntheses examined in this project, NHS-CRD stated that non-quantitative syntheses were acceptable but preference was given to meta-analysis. Although it looks as though the US Guide is not strictly a synthesis, they state that their results are summarized qualitatively with descriptive statistics like median and range of effect size and that a team of subject matter experts and methodologists make judgements as to which interventions will be considered together. Both statements may address some of the issues faced by researchers conducting a synthesis of the literature in health promotion.

** Syntheses preferred to weight their studies by methodological quality.*

For those initiatives considered to be syntheses, how they weighted or combined studies was reviewed. In Cochrane, weighting is based on methodological quality, size of study population, and degree of heterogeneity in the sample. US Guide gave weighting based on evidence criteria and identified that similar weight was given to a smaller number of better studies as a larger number of poorer studies. EPPI-Centre preferred meta-analysis but found that most existing studies could not be quantitatively combined. NHS-CRD identified that there were no formal procedures developed to date for the synthesis of qualitative studies.

5. Reporting Results — Similarities and Differences

** Many initiatives used a variety of user-friendly formats to disseminate their results.*

Given the interest in health promotion of working with communities, clients and users, the accessibility of the reports to lay people as well as

Reporting Results

- * Many initiatives used a variety of user-friendly formats to disseminate results
- * Methods of review and limitations of the review process were discussed and common report formats were used
- * Implications for policy and decision-makers were discussed

professionals is important. Most initiatives included an executive summary, synopsis or abstract for each review (11 in all). Some used a variety of media to disseminate the results — e.g. 50% of Cochrane reviews have synopses available in plain language; IUHPE 1999 highlights key impacts and other points in each chapter; public and private partners disseminate the US Guide using different products; EPPI-Centre produces summaries in ‘magazine’ type journals for practitioners; and NHS-CRD produces bi-monthly bulletins summarizing systematic reviews undertaken or commissioned by CRD, writes articles for professional and academic journals, produces specialist publications, electronic bulletins, and public and patient information materials. Greater attention was being paid to how the information can be used by practitioners and policy-makers.

** Methods of review and limitations of the review process were discussed and common report formats were used.*

Most initiatives (10 in total) included a discussion of the methods used by the review. Most reviews (9 initiatives) also followed a similar report format, making it easier to get familiar with the approach. Some initiatives provided overall coherence to their reports through following common themes, although the format of each review or chapter could be different — e.g. CHP connected each review to 5 Ottawa Charter Action Areas, National Forum connected each topic to determinants of health, US Guide related all chapters to Healthy People 2010. NHS-CRD acknowledged that reports may vary because of the different needs of those commissioning the reviews. Limitations of the studies and the review process were discussed in 7 initiatives. Conclusions and recommendations were made in six initiatives (Victoria, IUHPE 94, Heart Health, National Forum, US Guide, Alberta), and conclusions or impacts were presented but the aim of the review was to let the reader make up his/her own mind in four initiatives (Cochrane, IUHPE 1999, NHS-CRD, EPPI-Centre).

** Implications for policy and decision-makers were discussed.*

A description of the implications for policy, research, economic investment decisions, and practice is an indication of the intended audiences for the report and the significance of the information gathered. Eight initiatives included a section on the implications of their review for policy, service planning, research and implementation (IUHPE 99, National Forum, US Guide, NHS-CRD, EPPI-Centre, PHRED, Alberta, NHS-EED). Cochrane noted that although it did not provide direct policy advice, it provided important considerations for decision-makers including values and contextual factors that might influence decisions. The US Guide noted that its CDC connections made it more likely that its recommendations would be implemented in planning and practice in public health departments across the US.

6. Explicit Health Promotion Aspects — Similarities and Differences

** Some health promotion features were addressed by different initiatives but there were very few who addressed two or more key aspects.*

Each initiative was reviewed in terms of its explicit attention to any one or more of the key health promotion/population health features listed in

Table 1. Some initiatives were explicit about their connection to health promotion in their overall title or structure — Cochrane has a Health Promotion/Public Health Field, the Victoria series is called “Evidence-based Health Promotion,” IUHPE 1999 is called “The Evidence of Health Promotion Effectiveness,” and CHP 1996 symposium focused on the effectiveness of health promotion. The topics for review related to health promotion strategies and lifestyle behaviours in 9 initiatives. Settings, cultural context and the conditions for implementation were mentioned by Cochrane and Victoria. Two initiatives discussed community and population approaches (National Forum and US Guide), NHS-CRD accepted qualitative research (particularly for process and subjective experience studies), and EPPI-Centre accepted a wide choice of interventions. The Kahan and Goodstadt framework paid explicit attention to health promotion in every stage of the review process. Cochrane’s own methodology was becoming more health promoting by including ‘consumers’ to a much greater extent in developing reviews. All of these points are aspects which are important in a health promotion literature review or synthesis.

** Three initiatives used Ottawa Charter definitions of health promotion explicitly.*

Based on interviews or survey questions with key informants connected to seven initiatives, health promotion was conceptualized differently. Three initiatives used the Ottawa Charter definition of health promotion (Alberta, IUHPE 1999, US Guide)³; three did not use any definition for health promotion (EPPI-Centre, Heart Health, PHRED); and one (Cochrane) defined health promotion in terms of disease prevention or risk reduction. This is one indication of the potential “fit” of these initiatives with health promotion and the extent that their results will be relevant to health promotion policy-makers and practitioners.

Explicit Health Promotion Aspects

* Some health promotion features were addressed by different initiatives but there were very few who addressed two or more key aspects

* Three initiatives used Ottawa Charter definitions of health promotion explicitly

B. Challenges of Conducting a Synthesis of the Evidence in the Health Promotion Field

³ Ottawa Charter definition of health promotion: “. . . the process of enabling people to increase control over, and to improve, their health. To reach a state of complete physical, mental and social well-being, an individual or group must be able to identify and realize aspirations, to satisfy needs, and to change or cope with the environment.”

At each stage of a synthesis or review process, there are several challenges, some of which have been addressed in a variety of ways and some of which have not been addressed by the 17 initiatives reviewed. The existing synthesis initiatives provide good examples of screening and reporting processes appropriate to health promotion. The areas which presented the greatest challenges were around assessing the quality of evidence in the selection, analysis and synthesis phases. Each challenge is presented in this section and discussed in more detail with examples from the existing review initiatives when relevant.

Existing Initiatives Have Addressed Some Challenges

- * Theory plays an important role via:
 - interdisciplinary team to guide review
 - using analytic framework or logic model
 - being explicit about definitions and theoretical underpinnings
- * Comprehensive screening of literature via:
 - including all languages
 - including published & unpublished literature
 - including databases beyond MEDLINE
- * User-Friendly reporting for a variety of audiences:
 - executive summary in plain language
 - summaries in journals for practitioners
 - summary tables
 - bi-monthly bulletins
 - public & private partners disseminate
 - policy points highlighted

1. ***The Role of Theory in Screening and Identification of Studies*** — The health promotion field is eclectic with many different theories at different levels. Because health promotion practice is often multi-disciplinary and intersectoral, it is important to be clear about the theories, concepts, definitions and expectations reviewers and commissioners have from the beginning. This has been addressed in various initiatives through (a) setting up an interdisciplinary team to guide the synthesis or review (Cochrane, US Guide, NHS-CRD), (b) setting up an analytic framework or logic model to guide the analysis and synthesis phases (US Guide), and/or (c) being explicit about the definitions used and appropriate theoretical underpinnings (Kahan & Goodstadt). Some initiatives were unclear about the definitions of health promotion, disease prevention, population health, or public health they were using, or they used undifferentiated notions of health promotion and disease prevention.
2. ***Comprehensive screening of the literature*** — The health promotion field is multi-disciplinary and multi-sectoral, meaning that both qualitative and quantitative research methods are acceptable and a variety of discipline-specific databases need to be consulted. Thus it is important to be as inclusive as possible when screening for literature related to effectiveness for any topic. This has been addressed in several existing initiatives by (a) including all languages (Cochrane & Campbell), (b) including unpublished as well as published literature (Cochrane, NHS-CRD, Kahan & Goodstadt), (c) including databases beyond MEDLINE, such as Psychlit, CINAHL, ERIC, Soc Sci Cit Index (EPI-Centre, PHRED, and IUHPE94).
3. ***Reporting must be User-Friendly and for a Variety of Audiences*** — In health promotion, community members, practitioners, and local decision-makers are interested

in the results of a synthesis of effectiveness information, so the information needs to be presented in a variety of ways, recognizing the needs of different audiences. Existing initiatives have addressed this by (a) including an executive summary in plain language (50% of Cochrane reviews), (b) summaries in ‘magazine’ type journals for practitioners (EPI-Centre, NHS-CRD), (c) summary tables (CWHPIN, Ounce of Prevention), (d) bi-monthly bulletins summarizing systematic reviews undertaken or commissioned (NHS-CRD), (e) summary statement for practitioners and managers available on the web and a policy summary (PHRED), (f) public and private partners disseminate using complementary media and tailored products (US Guide), (g) key impacts and other policy points highlighted using symbols (IUHPE99).

- 4. *Inclusion Criteria have to be Broad***
 — Health promotion concepts argue for broader criteria around what constitutes an appropriate range of studies from which to obtain evidence. Studies that provide process and intermediate outcome evidence are important in addition to studies of final outcomes. Qualitative and quantitative information and objective and subjective indicators are important. In many cases, evidence is derived from research & evaluation designs which include key stakeholders. With broader criteria, standards of acceptable evidence are still required and this is a challenge. A broad inclusion of evidence considered appropriate also creates challenges at the analysis and synthesis phases by adding to the scope and complexity of these phases (see #6 below).

Challenges to Conducting a Synthesis That Still Have to be Addressed

1. Inclusion criteria have to be broad
 - standards of acceptable evidence reflecting a broader range of possibilities are required
 - scope and complexity of analysis and synthesis steps increased
2. Hierarchy of evidence needs to include more criteria than quality of study design
 - alternative hierarchy of evidence required
3. Comprehensive inclusion criteria create requirements for a complex analysis
 - integration of a range of research designs required
 - too few evaluation studies in health promotion/ population health
4. Quality assessment protocol has to include qualitative and quantitative studies
 - variety of quality assessment instruments available for quantitative and qualitative studies but no consensus on appropriate protocols
 - qualitative field in earlier stages of development of appropriate protocols
5. Qualitative synthesis protocol required

The Victoria reviews and IUHPE 1999 explicitly included process evaluations and studies investigating intermediate outcome measures. The NHS-CRD accepted quantitative and qualitative studies but preferred quantitative ones. The reviewers for the CHP 1996 Symposium chose a variety of evidence criteria, some of which were very broad. The Alberta evaluation process included process and outcome evaluations and participatory research designs. The Campbell Collaboration proposed randomized field trials as an alternative to RCTs and the Kahan and Goodstadt framework tried to be as comprehensive as possible in its proposal to include studies relevant to health promotion.

5. ***Hierarchy of Evidence Includes More Criteria than Quality of Study Design*** — Almost all of the existing initiatives stated that the randomized controlled trial was their preferred source of quality evidence. Given the requirements in health promotion for action research designs and qualitative methods, a hierarchy of evidence with RCTs at the top is inappropriate. The usual validity criteria, for which the RCT is ideal, emphasize internal validity⁴ and are most suited for single interventions, individual focus, behavioural or clinical results, and quantitative methods. Health promotion uses multiple interventions, a population or community focus, social, political and behavioural results, a combination of quantitative and qualitative methods, and participatory action research or evaluation approaches. The setting, audience and time of the interventions are also important which should lead to a greater emphasis on external validity in study assessment⁵. An alternative hierarchy of evidence is required (see #7 below as well).

Although existing review initiatives have made several suggestions for alternatives to the hierarchy of evidence with RCTs at the top, each of these alternatives needs to be examined with respect to health promotion requirements in order to develop a preferred alternative. The Alberta initiative selected exemplary projects based on meeting health promotion values and good evaluation designs, NHS-CRD advocated that the evidence standard should depend on the focus of the question (which leaves some flexibility for the development of standards suited to health promotion), and PHRED suggested that studies should meet 4 of 9 quality assessment criteria from Sackett et al. (1991). The US Guide specified that evidence from comparison group studies was required for effectiveness decisions but they also accepted a variety of other study designs for other issues, such as barriers to implementation.

There are also arguments that health promotion should not be focused on creating a suitable hierarchy of evidence but rather that it focus on using a judicial concept of evidence (the weight of evidence which would lead a jury to commit to take action even when 100% proof is not available, Tones, 1997). Such a concept would lessen the requirement for high quality experimental study designs.

6. ***Comprehensive Inclusion Criteria Create Requirements for a Complex Analysis*** -- With a comprehensive screening process to include a wide range of studies (published and unpublished, a variety of research & evaluation designs, all languages) to meet health promotion requirements, greater complexity is created at the analysis and synthesis phases. Many of the review and synthesis processes were explicit about the ways they were reducing the complexity of their analysis by having very restrictive criteria of

⁴ Internal Validity = extent to which alternative explanations of a presumed causal relationship can be ruled out (usually by using a control group or experimental design)

⁵ External Validity = extent to which findings can be generalized beyond the experiment (e.g. not affected by unique setting or behaviour not affected by participation in the experiment)

acceptable evidence (e.g. RCT). The Heart Health review set limits in terms of what it would exclude from the beginning (e.g. tobacco, single risk factor, not at community level) which assisted in reducing the number of studies to be reviewed. This is an example of using health promotion criteria to help restrict rather than broaden the number of studies to be included. Other synthesis initiatives focused on hypothesis testing (e.g. NHS-CRD), or only reviews (e.g. PHRED), or needs of the audience (e.g. EPPI-Centre).

It is unclear whether there are existing protocols for conducting complex analyses of studies using a range of research designs (including quasi-experimental designs, and participatory research), including both internal and external validity issues, qualitative and quantitative research, multiple strategies, many levels of effect, and many temporal relationships. In health promotion, this situation is exacerbated because there are fewer studies, making it difficult to have 2 or more studies in each cell of comparison. Mixed method evaluation designs have been recognized as important but integration is an issue. The Cochrane/Campbell Non-Randomized Studies Methods group is considering this issue.

7. ***Need Qualitative Research Quality Assessment Protocol for Analysis Phase*** — A quality assessment protocol suited to health promotion would need to be clear about quality of evidence accepted for quantitative AND qualitative studies. The practice of quality assessment of quantitative studies is well-established and considered to be essential to the proper conduct of a systematic review of such studies. The quality of clinical trials influences the intervention effect size observed, with trials of low quality tending to find larger effect sizes than do trials of high quality; hence the concern to assess the quality of trials included in a review. Although it may seem that there is consensus about how to assess quantitative studies, there is an ongoing debate. A large number of instruments (scales or checklists) is available to assess the quality of trials, the number of instruments at least doubling in the past five years and the instruments themselves becoming more comprehensive. This has resulted in a potentially confusing plethora of instruments, with real consequences for the assessment of studies and the results of reviews: Juni *et al.* (1999), in an examination of 25 different quality rating scales, found that the effect size of the intervention reviewed either increased or decreased with increasing trial quality, depending on the scale used. Trials rated as high quality by some instruments showed positive results, while trials rated as high quality by other instruments showed negative results. Thus, a consensus on assessing the quality of trials is yet to be established. Berlin and Rennie (1999) suggest that a complete definition of trial quality should take into account the trial's external validity and its statistical analysis in addition to its internal validity, and perhaps should include its ethical aspects.

The quality assessment of qualitative studies is a burgeoning topic in the systematic review field. The contribution of qualitative studies to health and medical research is becoming well-established, with a concomitant interest in the assessment of qualitative study quality. Most of the groups reviewed in the present document are contending with the issues of assessing the quality of qualitative studies and incorporating their results in evidence syntheses. A variety of quality assessment checklists and tools is available, and

the Cochrane and Campbell Collaborations' Qualitative Methods Group was proposed explicitly, among other things, to develop and disseminate methodological standards for critically appraising qualitative studies. While a consensus appears to have developed that the quality of qualitative studies can indeed be assessed, the manner of that assessment remains controversial. The mechanical use of checklists to improve or assess the quality of qualitative research has been especially criticized (Barbour, 2001; Eakin, 2001), the point being that a qualitative study's quality must be understood in the broader context of the investigative quest and the appropriateness of the study's theory, approach, and analysis in that context rather than in whether or not the study meets certain standard criteria. Thus, work in the area of qualitative study quality assessment is ongoing.

An outstanding issue is the extent to which existing evaluation tools and principles are not consistent with health promotion values. For example, participatory research is seen as an ethically appropriate way by which to engage disadvantaged groups in the evaluation of health programs and is consistent with health promotion values, but it is contrary to the common evaluation principles of neutrality, objectivity and value freedom (Parry *et al.* 2001). How are these principles to be balanced in an assessment of study quality? Parallels may exist between this concern and that to create a "complete definition" of quality that includes the ethical aspects of clinical trials, as suggested by Berlin and Rennie (1999), above, for the assessment of quantitative studies.

8. **Need for Qualitative Synthesis Protocol** — With an increased focus on importance of qualitative methods in health promotion-related research, there needs to be a qualitative synthesis protocol (parallel to meta-analysis for quantitative data) which is widely recognized and accepted in the qualitative research field. Large social programs have so much information that cannot be put into a meta-analysis in the current state-of-the-art (key informant connected to US Guide). Several initiatives accepted both quantitative and qualitative syntheses (NHS-CRD, Kahan & Goodstadt, Campbell) but they did not have an accepted qualitative synthesis protocol. This could imply that the qualitative information was of inferior quality or second best. An accepted protocol would assure users there is rigour in this approach and also assist reviewers in deciding when it is appropriate to combine results.

C. **Uptake of Evidence by Policy and Decision-makers**

The relationship between systematic reviews of the evidence of health promotion effectiveness and policy and decision-making is complex. It involves an understanding about how decisions are made and how evidence is only one factor in the decision-making process. Some of the general factors that affect the uptake of evidence in decision-making in government are stable government structures and bureaucracy, public support, political favour, accessibility of information and its relevance (Lord, 2001). The health promotion field has had success in capitalizing on one or more of these factors for some issues (e.g. tobacco, seat belt legislation,

drinking and driving). However, there have been other factors that have limited the capacity of health promotion to influence decision-makers such as the lack of consensus on what constitutes evidence and no citizen constituency mobilized for health promotion.(Hyndman, 2001). The frameworks and procedures used by the initiatives were reviewed for their connection to policy-makers and the key informants contacted from several of the review initiatives were asked whether their reviews were used by policy and decision-makers and what affected their uptake. The points described below reflect our review of the frameworks and the views of some individuals involved in these synthesis initiatives and are not an attempt to present a thorough discussion of the issues affecting the uptake of evidence by policy-makers.

** Many initiatives attempted to make their information relevant to decision-makers.*

Six initiatives reviewed for this paper included a section on the implications of their review for policy, service planning, research and implementation. In addition, the interviewee connected to Cochrane noted that although Cochrane did not provide direct policy advice, it provided important considerations for decision-makers including values and contextual factors that might influence decisions.

One could assume that some synthesis initiatives are of particular importance to government decision-makers because they have commissioned or supported the work in the first place -- US Guide is supported by CDC, National Health Service in the UK supported NHS-CRD reviews among other commissioners, the Alberta initiative had a close relationship with its provincial Ministry of Health and Wellness, the Heart Health Resource Centres in Ontario were supported by the Ministry of Health and Long-term Care.

** Some reports that local organizations used review results in their program planning.*

At the local level, the interviewee connected to the Alberta initiative reported examples of local planners and funders using their framework to plan prevention of family violence programs in Calgary and Salt Spring Island. EPPI-Centre reported that their reviews have been useful to the government for highlighting what further research needs to be commissioned. EPPI-Centre also said that anecdotally, policy-makers say they find the reports useful. Others said that they had no concrete information on the impact of their reviews (IUHPE 1999, PHRED) and that it was difficult to assess the impact without funding to study it (EPPI-Centre).

** A close relationship between government or commissioning agencies and the review group improves the uptake of review results.*

The close relationship between a government department and the systematic review group appears to influence the uptake of the review results. The key informant connected to the Alberta initiative stated that Alberta Health and Wellness collaborated in publishing the report and sending it to 17 Regional Health Authorities (RHAs) in Alberta. The key informant also pointed out that the initiative provided input to Alberta Health and Wellness at the time they made a

Relevance of Review Initiatives to Policy

- * Many initiatives attempted to make their information relevant to decision-makers.
- * Some reports that local organizations used review results in their program planning.
- * A close relationship between government or commissioning agencies and the review group improved the uptake of review results.

decision to renew provincial funding to RHAs for health promotion programming. Strategic directions for heart health in Ontario were supported by evidence which was attributed to the work of the Heart Health initiative. A review of peer-delivered health promotion programs was reported by the interviewee connected to EPPI-Centre to be useful to policy-makers for a briefing of Ministers in the UK and was being used by a working group organized by the Social Exclusion Unit to explore the relevance of peer education in promoting the health of socially excluded groups. The best examples of the relevance of the reviews to policies and decision-making appears to come from the experience of the US Guide to Community Preventive Services. The key informant stated that their report *Motor Vehicle Occupant Injuries: Blood Alcohol and Fatal Crashes* resulted in action by the US Congress and the National Traffic Safety Association to change the recommended blood alcohol level to .08. As a result of their *Vaccine Chapter*, the US Agency and Medicare changed coverage for certain adult immunizations. It is clear that uptake of the information provided by these initiatives was most likely (of that known to the key informants) to occur in the government closest to the initiative (USA affected by US Guide, UK by EPPI-Centre, and Alberta by the Alberta initiative).

The topics chosen for review represent another factor affecting the information that can be used by decision-makers. After examining the titles of the reports linked to each of the initiatives reviewed for this paper, there are some areas which are reviewed more frequently and others that are missing. The following chart (Table 2) outlines the major categories of topics and the initiatives that address them.

Table 2. The Categories of Topics Reviewed by the 17 Initiatives Included in this Study

Topics Reviewed	Reviewers
Lifestyle Factors (e.g. drugs, alcohol, sexual health, nutrition, tobacco, physical activity, oral health)	11 Initiatives (Cochrane, US Guide, CWHPIN, NHS, CDC EE, IUHPE 94, IUHPE 99, PHRED, Victoria, EPI-Centre, Alberta)
Injury Prevention (e.g. child injuries, drowning, bicycle, safety, motor vehicle, school-based, falls prevention, and violence reduction)	9 Initiatives (Cochrane, US Guide, CWHPIN, NHS, CDC EE, IUHPE 99, PHRED, Victoria, Alberta)
Cardiovascular Health	6 Initiatives (Cochrane, NHS, CWHPIN, IUHPE 99, Heart Health, CDC EE)
Mental Health (including suicide)	6 Initiatives (CWHPIN, PHRED, Cochrane, NHS, US Guide, IUHPE 99)

Disease Prevention (e.g. diabetes, infectious disease, HIV/AIDS, STD, respiratory, cancer, asthma, influenza, neural tube defects, osteoporosis, polio, tetanus, tuberculosis, sickle cell disease, obesity)	6 Initiatives (Cochrane, US Guide, CWHPIN, CDC EE, IUHPE 94, NHS)
Age or Stage of Life (e.g. older people, adolescent health)	5 Initiatives (NHS, IUHPE 99, Victoria, EPI Centre, PHRED)
Family Health (e.g. reproductive health, breastfeeding, parenting)	5 Initiatives (US Guide, CWHPIN, CDC EE, NHS, PHRED)
Settings (e.g. schools, workplaces, health care services)	5 Initiatives (NHS, IUHPE 94, IUHPE 99, EPI Centre, CHP)
Health promotion in general	3 Initiatives (EPI Centre, NHS, IUHPE 94)
Environment (e.g. sociocultural environment, environmental awareness, supportive environments)	3 Initiatives (US Guide, PHRED, CHP)
Interventions (e.g. home visiting, electronic support groups, healthy public policy, personal skills)	2 Initiatives (PHRED, CHP)
Community Action (including community-based interventions)	2 Initiatives (PHRED, CHP)
Equity in Health	1 Initiative (IUHPE 99)

As can be observed from this brief review of titles, the major organizing frameworks for these systematic reviews centred on lifestyle factors, injury prevention, cardiovascular health, mental health and disease prevention. Although different combinations of interventions are discussed in relation to these topics, the possible gaps from a health promotion intervention perspective are community action, intersectoral collaboration, capacity-building, healthy public policy and the role of sociocultural environments.

D. Economic Evaluations and Health Promotion Systematic Reviews

Economic evaluation is the systematic attempt to identify and, where possible, measure and compare the costs and outcomes of at least two alternative policies. For definitions of several major types of economic evaluations, see Table 3. We reviewed two initiatives for this paper. One is a continuously updated database maintained by the National Health Service in the UK (the National Health Service Economic Evaluations Database -- NHS-EED) and the other is a summary report prepared by the Centres for Disease Control and Prevention (CDC) called “An

Ounce of Prevention. . . What are the Returns?’’ in October 1999. The NHS-EED is a collection of abstracts and a bibliography and the CDC report is a synthesis of studies for selected topics. These two reviews are a very small sample of the number of economic evaluation analyses and initiatives that exist. The intent was to begin to explore some of the issues presented by reviews of economic evaluations in relation to health promotion and population health.

Table 3. Definitions of Major Types of Economic Evaluations

Economic Evaluation Term	Definition
Cost-benefit analysis	<ul style="list-style-type: none"> - Measures both costs and benefits in monetary values and calculates net monetary gains or losses (presented as a cost-benefit ratio) - Used to compare study results with other public spending options
Cost-utility analysis	<ul style="list-style-type: none"> - Measures the benefits of alternative treatments or types of care by using utility measures such as Quality-adjusted Life Years (QALYs) and may present relative costs per QALY. - Used to compare study results with other health spending
Cost-effectiveness analysis	<ul style="list-style-type: none"> - Compares interventions with a common outcome to discover which produces the maximum outcome for the same input of resources in a given population. - Used to compare study results with other interventions focused on the same goal or health outcome - study results are (net costs)/(unit of health outcome)

The rest of this section describes the strengths and weaknesses of the two economic evaluation initiatives that were reviewed in relation to the steps of a synthesis process and to key health promotion features.

Re Identification of Studies: In the screening and identification of potential studies to be included in a review, NHS-EED searched common databases (e.g. MEDLINE, CINAHL), handsearched 67 journals (20 of which were relevant to the health promotion field), scanned working papers from 14 research centres specializing in health economics worldwide, and reviewed technology assessments published by 32 technology assessment centres. The CDC study focused on cost-effectiveness studies related to specific strategies of the US Healthy People 2010 Report. In both cases, the criteria were designed to enable the reviewers and scanners to pick up economically based studies, with no particular bias for or against health promotion or population health studies. The same limitations in selection presented by limits to certain databases and journals for other systematic reviews are at work in economic reviews. By the same token, broadening the terms of the search to include other databases and journals

relevant to health promotion and population health can increase the likelihood of finding relevant health promotion studies with economic evaluations. The real limitation is that few studies of cost-effectiveness or any other kind of economic analysis have been done in the health promotion/population health field.⁶

Re Selection of Studies: For the NHS-EED, studies were abstracted if they were a full economic evaluation (comparison of two or more alternatives, costs and outcomes of alternatives are examined using cost-benefit, cost-utility, cost-effectiveness, -- cost-minimization, and cost-consequence analyses were also included). If the paper was a burden of illness study or a cost of treatment paper, discussion of methods, or a review of economic evaluation in general, it was given bibliographic details only. At this stage, economic evaluations are dependent on the evidence of effectiveness and they tend to use criteria based on the quality of the research design. Economic analysts prefer hard data to people's views or opinions and tend to rule out qualitative research designs, according to Tom Sefton (2000). However, NHS-EED demonstrated a broadening of inclusion criteria by including opinion as the basis for clinical evidence as long as the key assumptions, methods to get opinions, and estimates of effectiveness were described. This may be an example of how one might include opinion as a component of a review in health promotion. The CDC report makes reference to using a standard method to evaluate effectiveness but the criteria used to judge effectiveness were not described. They do point out that the cost-effectiveness information they presented was limited by the methods, assumptions and accuracy of the original research. Their economic inclusion criteria were derived from articles, textbooks and expert opinion.

Re Analysis of Studies: Economic evaluations have to review the studies both in terms of the effectiveness of the studies and in terms of the quality of the economic analysis. The focus of the analysis in the CDC report was on the quality of the economic analysis. The critical comments requested of the reviewers for the NHS-EED related to the quality of the study in relation to the choice of comparators, and the validity of the estimates of benefits and costs.

Re Synthesis of Studies: For each topic in the CDC report, interventions with economic evaluations were compared and summary cost-comparison data were presented. The NHS-EED only provided abstracts and did not conduct a synthesis. There are issues around integration of cost-related findings from evaluations of programs in different societies, at different points in time and for different purposes, particularly with respect to cost-benefit analyses. The costs of implementing a program in Alaska or Zambia differ from establishing a comparable program in Canada, plus the assignment of monetary values to program outcomes will differ as the value of the outcome to society differs. These issues are common to integration of all economic evaluations and they are significant in health promotion because it is so likely that the synthesis step will require comparison of programs from very different cultural contexts and points in

⁶ Bonnie Brush at the University of Calgary corroborates this statement in her research around a census of economic evaluations of public health interventions — studies on economic analysis of primary public health interventions are fewer than anticipated.

time. (Jackson et al., 1998) For example, in the CDC report, costs of each study were compared in the units used by each study and a common measure was not developed; thus, it was not possible to directly compare and synthesize the results from all the studies.⁷

Re Report-writing: Both initiatives had consistent reporting formats. The NHS-EED discussed its methods and presented the methodological limitations and policy implications for each study. They presented a series of abstracts rather than a synthesis. The CDC document was at the opposite extreme — it was a synthesis with very few details about the methods used to select and analyze its studies and it did not discuss the limitations of the studies or its approach. The policy implications were embedded in each section of the report through presentation of the costs associated with each alternative intervention.

Re Explicit health promotion concepts: No explicit health promotion interventions, topics or concepts were used to include or exclude studies in NHS-EED. In a keyword search of this database using the term ‘health promotion,’ there were no hits. Using ‘disease prevention,’ there were 17 records identified. Of those, six dealt with cardiovascular disease prevention, five studied clinical or medical therapies, two looked at environmental health issues like blood lead levels and radon, two reviewed prevention of sexually transmitted diseases, one reviewed comprehensive health promotion and disease prevention programs in the worksite, and one looked at the effects of a nutrition education program. The CDC organized its report around disease or injury topics, although there was no selection against health promotion interventions if they could meet the criteria for quality of economic analysis.

There are several challenges faced by economic evaluators in relation to the key health promotion features described in Table 1 and they are listed in Appendix D. This is not a comprehensive list of all of the potential issues faced by economic evaluators (a complete literature review of this field was not conducted) but rather a sample of the issues which have been identified in the few materials reviewed for this project and by those consulted.

Some Key Issues in Economic Evaluations in Health Promotion

- * reliance on criteria of effectiveness based on research design
- * few economic evaluation studies done in health promotion
- * difficult to assign monetary or other values to long-term, multiple, qualitative outcomes
- * difficult to integrate results of studies across different contexts and time periods
- * usually done for clinical interventions and applied less often to broader social and political interventions

⁷In environmental economics, there is a methodology that is growing in scope and rigour called Benefits Transfer. This has provided a way to value elements such as clean air and ecosystems that remains time and cost-effective. Perhaps it will be of benefit in health economics, especially in relation to health promotion. (Bonnie Brush, University of Calgary, private correspondence in relation to this project, June 18, 2001)

IV. IMPLICATIONS OF ASSESSMENT OF EXISTING SYNTHESIS FRAMEWORKS

A. Relevance of Synthesis Initiatives Reviewed to Policy and Decision-Makers

The existing systematic review initiatives represent a considerable investment of human and other resources regarding the question of what works in health promotion. Although this paper argues that there are limitations in the synthesis of evidence processes used for health promotion by all current initiatives, we have concluded that some initiatives would be helpful to government policy and decision-makers who want/need to know about the effectiveness of health promotion interventions. Table 4 summarizes initiatives that we consider to be the most helpful at the present time -- in the absence of a more suitable set of protocols for conducting a synthesis of the evidence in health promotion/ population health. The criteria we used to identify these three initiatives were currency (ongoing and continuously updated processes), breadth of screening process, evidence standards beyond RCT, and sensitivity to some health promotion concepts and issues. (See Appendix A for information on the topics produced by each initiative to date.)

Table 4. Summary of Current Synthesis Initiatives Most Relevant to Building Evidence in Health Promotion

Initiative	Strengths	Weaknesses
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<p>US Guide</p>	<ul style="list-style-type: none"> * uses an interdisciplinary team and a theoretically informed analytic framework to guide process * accepts published & unpublished studies * accepts non-comparison group study designs * uses a variety of dissemination mechanisms * is currently undertaking reviews 	<ul style="list-style-type: none"> * topics have a disease prevention orientation (although this involves considerable overlap with health promotion interventions)
<p>Cochrane</p>	<ul style="list-style-type: none"> * guided by an interdisciplinary team * accepts published and unpublished studies in all languages * creates executive summaries * is an ongoing system * has a health promotion/public health field and a non-randomized study methods group to address some of the concerns raised in this paper 	<ul style="list-style-type: none"> * initially focused on RCTs as gold standard, but now prepared to accept alternatives
<p>Campbell</p>		
<p>NHS-CRD</p>	<ul style="list-style-type: none"> * guided by an interdisciplinary team * accepts published & unpublished studies, quantitative & qualitative studies * creates summaries for practitioners * is ongoing & continuously updated 	<ul style="list-style-type: none"> * primarily focuses on clinical and medical interventions * standards of evidence vary—depends on focus of question

B. An Ideal Health Promotion Synthesis Framework

This section discusses each of the stages of carrying out a systematic review and, building on the experience of other review initiatives, suggests initial elements that might form

the basis of an ideal framework. The ideal model presented in Figure 1 gives special attention to the unique characteristics and challenges associated with identifying, analyzing, synthesizing and reporting on evidence from the health promotion field.

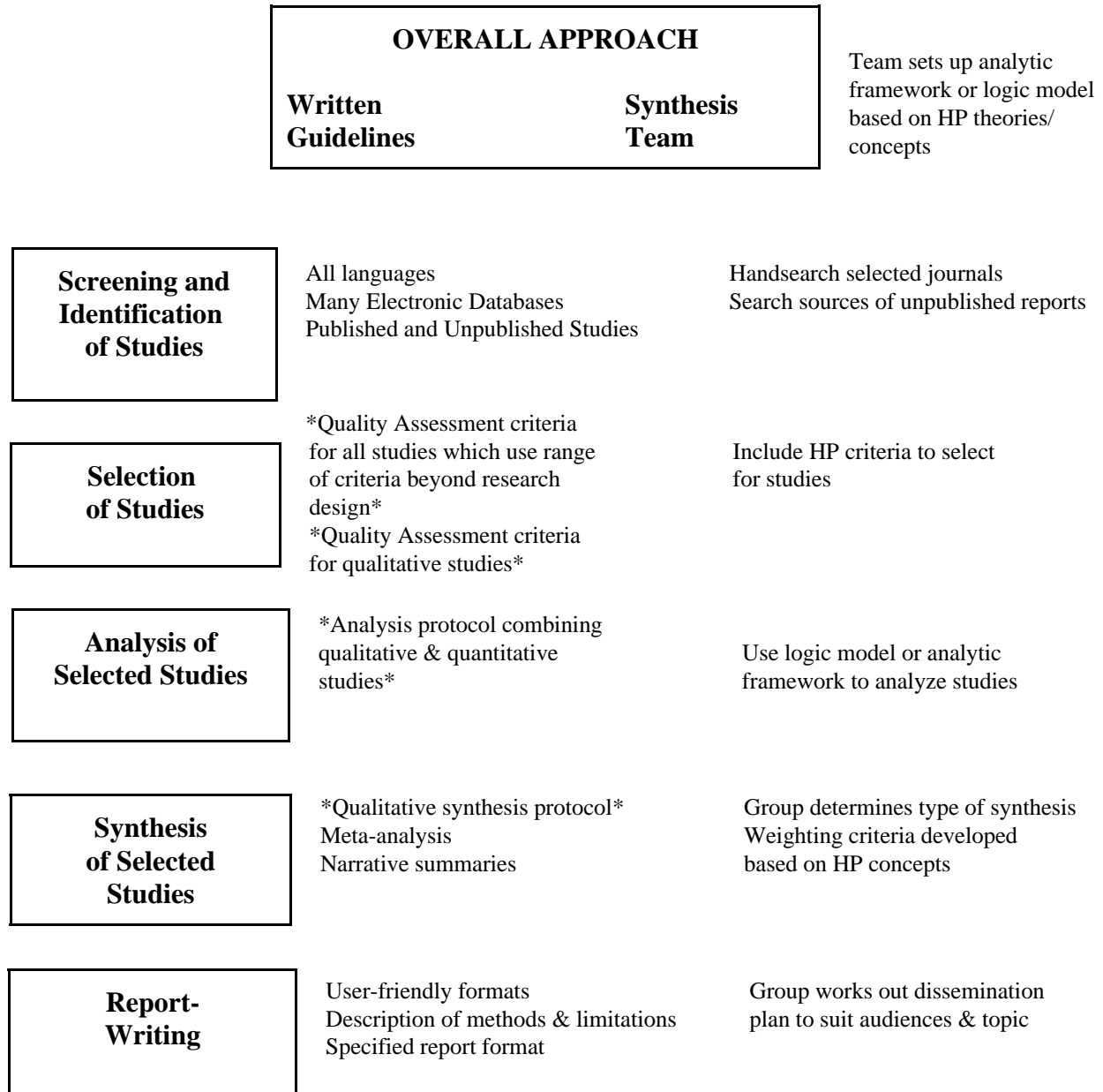
As indicated in Figure 1, the **overall approach** to a synthesis should be guided by a clearly articulated/written general set of principles, guidelines, and protocols as well as an interdisciplinary synthesis team. It is expected that this overall approach (and its constituent guidelines, principles, and protocols) would be identified and/or developed in consultation and partnership with both experts and consumers. Existing initiatives provide important information concerning both appropriate ways in which to proceed and gaps that need to be addressed.

Of special significance would be the creation and composition of an interdisciplinary **synthesis team** that would ensure that the synthesis initiative is based upon appropriate substantive, theoretical, and methodological expertise and experience; such a team should include representatives of consumer or end-user groups (see the US Guide and Cochrane Collaboration initiatives). The synthesis team would provide direction and focus, establish a guiding analytic framework or logic model, assist in developing a strategic approach to searching the literature (published and unpublished), and resolve disputes and issues that may arise (see, for example, the US Guide to Community Preventive Services).

At the “**screening and identification of studies**” phase of a systematic review, written guidelines should encourage a comprehensive search of the literature that (1) includes all (accessible) languages (see, for example, the Cochrane Collaboration), (2) searches many databases—particularly those that are most likely to include both qualitative and participatory research studies (e.g., Psychlit, Social Sciences Citation Index, EMBASE, CINAHL—EPPI-Centre routinely searches these data bases), and (3) searches for both published and unpublished studies (e.g., Cochrane and NHS-CRD). Many of these databases may still miss some of the literature significant to the health promotion field, thus it is important to have the Synthesis Team play a role in suggesting where to look for unpublished studies and which journals should be hand-searched.

At the phase when **studies are selected for analysis and synthesis**, written guidelines should specify selection criteria that extend beyond assessment of the quality of study design. Other important selection criteria include: health promotion values, focus on determinants of health, use of multiple strategies, focus on communities or populations, participation by community members, and a focus on both process and outcome evaluations. The Alberta, Heart Health, CHP and National Forum initiatives provide examples of review processes that employed broader selection criteria that incorporated key health promotion characteristics, although none included all potentially relevant criteria.

Figure 1. Ideal Health Promotion Synthesis Framework



Team sets up analytic framework or logic model based on HP theories/ concepts

* Gaps in currently available procedures

Even with the inclusion of the above health promotion-relevant criteria, an ideal synthesis framework would still assess studies for the quality of their research/evaluation design. Although quality assessment criteria for quantitative studies in most initiatives focused on the RCT as the design of choice, there is a need to include a broader range of acceptable research designs. This is a gap that still needs to be addressed. We think it would be useful to follow the PHRED example and require that the study meet at least 4 of 9 criteria (they used criteria developed by Sackett et al. 1991). Since many health promotion studies are qualitative (or include qualitative elements), it is essential to identify/develop assessment criteria for qualitative studies; checklists already exist but the qualitative research field is still debating them.

A suggested set of **guiding principles** that might form the basis for assessing the quality of health promotion-relevant evidence (from Kahan & Goodstadt, 2001) include:

1. **re. the foundations of evidence, evidence should:**
 - reflect health promotion values, goals, ethics, theories, underlying beliefs, understanding of the environment, and practice
2. **re. the sources of evidence, evidence should:**
 - derive from a wide variety of sources and methods
 - be drawn from sources internal and external to the particular initiative
 - derive from sources that include all key stakeholders and relevant key informants
 - include results/outcomes related to past and current practice
3. **re. the nature of evidence, evidence should:**
 - transcend information supporting conventional wisdom, that is, include information supporting new or non-mainstream ideas as well as information contradicting generally accepted ideas
 - be high quality
 - be qualitative and quantitative, subjective and objective
 - be appropriate to the issue, setting, etc.
 - include the relationship between these results/outcomes and processes

Such a set of criteria could form the basis for establishing a “hierarchy” of sources of evidence concerning the effectiveness of health promotion.

At the “**analysis of studies**” phase, the greatest challenge is to develop a protocol that is adequate in handling the complexity of the multiple strategies, variables, and forms of evidence (both quantitative and qualitative) that characterize health promotion studies/research studies. A logic model or analytic framework, developed by the initiative’s synthesis team, would be invaluable (if not essential) in guiding this process. Another approach consistent with health promotion principles is “what are the minimum data sets that would allow us to compare interventions (even though they may be modified for implementation in different communities)?”

At the **synthesis** phase of a systematic review, the initiative’s synthesis team should play a role in identifying and/or developing appropriate synthesis methods. The synthesis could include any combination of quantitatively-based meta-analyses, syntheses of qualitative studies, and/or a narrative summaries of the evidence—the current absence of standard guidelines for a

qualitative synthesis represents a gap that requires urgent attention. As already discussed, in any synthesis, weighting of evidence should extend beyond the type of research design employed, to include other health promotion-relevant criteria (see, for example, Table 1 and Kahan and Goodstadt's suggested criteria listed above).

Finally, an ideal synthesis framework should specify, in advance, the pre-requisites for the final **report-writing** phase of the synthesis/review process, including: general reporting formats, user-friendly formats, formats for describing the methods employed, requirements with respect to identifying limitations of the synthesis/review, and minimum considerations for effective dissemination and utilization of findings (see, for example, Cochrane, EPPI-Centre, NHS-CRD, US Guide, IUHPE 1999, PHRED). The Synthesis Team could add value by assisting to develop a dissemination plan to suit the various audiences (including community members) for the topic concerned.

In conclusion, there are good examples of guidelines and processes from the existing synthesis initiatives around overall approach, screening and identification of studies and report-writing. There are major gaps in what is needed to select studies, analyze and synthesize them.

V. CONCLUSIONS

In this paper, we identified some of the defining features of a health promotion approach to conducting a systematic review and we used these in undertaking a preliminary assessment of the gaps in current systematic review processes. While it would be important to bring together academics, policy-makers and practitioners to develop consensus concerning the critical elements for guidelines and protocols that take a health promotion perspective, our analysis suggests that there are some basic gaps.

The following steps are prerequisites for the development and application of a framework that addresses the current gaps in synthesizing evidence concerning the effectiveness of health promotion, as identified in the previous section:

1. Develop quality assessment criteria for *selection* of studies that extend beyond type of research design to include criteria that relate to the defining characteristics of health promotion;
2. Develop quality assessment criteria for *assessing* qualitative studies based on an appropriate understanding and valuation of qualitative research/evaluation designs, and that are suited to the health promotion field;
3. Develop protocols for conducting qualitative study *synthesis*;
4. Develop weighting criteria for *syntheses* that extend beyond a focus on research design to give attention to study characteristics that are relevant to health promotion;
5. Develop guidelines for the minimum information required from studies in undertaking syntheses of studies with different populations in different settings.

In addition, there are other issues that need to be resolved in order to ensure the viability and success of a Canadian initiative to synthesize and increase the attention given to evidence in health promotion and population health. One is that health promotion programs and research in Canada have been poorly resourced over the last 20 years and this has resulted in very little good quality information available to include in a review, particularly with the narrow study design oriented criteria that have been applied in many of the existing reviews. Better funding for evaluation and research linked to major program initiatives and community programs in Canada is required.

It is also important to use Canadian resources strategically and this could include collaborating with existing international initiatives. For example, the Cochrane/Campbell Collaboration is already developing guidelines to guide quality assessment for qualitative studies.

The US Community Preventive Services Guide is a large multi-year undertaking requiring substantial resources. Canada could use the results of this initiative's syntheses and reviews to inform policy development, and to build on this work by developing a body of evidence on newer topics with an enhanced focus on the range of determinants of health, as has been initiated by the Health Development Agency in the United Kingdom. The evidence base could be expanded into areas such as intersectoral collaboration, community capacity-building and healthy public policies.

Economic evaluations are a critical but underdeveloped component of policy decision-making, especially in the health promotion field. Many of the points described above in developing written guidelines address issues faced by economic evaluators. An increase in the number of quality economic evaluations is required.

In conclusion, in order to improve the evidence base for policy- and decision-making in health promotion and population health, a new synthesis framework and set of written procedures appropriate to health promotion needs to be developed and tested, and more funding for evaluation and research linked to major program initiatives and community programs in Canada is required. Implementation of the ideal framework recommended in this paper would significantly increase the confidence of health promotion practitioners and policy-makers in using the results of such reviews and their willingness to contribute to the database.

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APPENDIX B. DETAILED METHODS

Phase 1 -- Description of Key Features of Each Initiative:

The first phase was descriptive -- each initiative was reviewed in terms of the criteria or methods each used for each stage of a synthesis or review process:

1. Identification of studies for potential inclusion in the synthesis
2. Selection of studies to be included in the synthesis
3. Analysis of information included in each selected study
4. Synthesis of information from all selected studies
5. Reporting on methods and results of the synthesis or review.

Also, as part of Phase 1, each initiative was examined for how it defined health promotion, population health and related concepts.

Phase 2 -- Comparison of Similarities and Differences of Initiatives:

In the second phase of review and analysis, the key features of each initiative were highlighted and compared in summary tables. Questions were developed for each stage of the synthesis process that addressed health promotion concerns and issues. The questions are listed below and the rationale for choosing these questions is outlined in the section in this paper describing the similarities and differences between existing frameworks.

1. Identification of studies for potential inclusion in the synthesis
 - Did outside experts (non project staff) play a role in this stage?
 - How comprehensive was the search? (Did it include published and unpublished studies? Which languages were included? Which years were included?)
 - Which electronic databases were searched?
 - What role did theory/conceptual frameworks play in the search process?
2. Selection of studies to be included in the synthesis
 - What hierarchy of evidence was used to select studies for inclusion?
3. Analysis of information included in each selected study
 - How were the studies initially coded or categorized?
 - What judgemental categories were used? (When was assessment or judgement of reviewer used to categorize the studies and what were the criteria?)
4. Synthesis of information from all selected studies
 - Were the results of several studies combined, either quantitatively or qualitatively to draw conclusions about the effectiveness of an intervention; or was the information only summarized (as in an annotated literature review)?
 - If synthesis was attempted, what guidelines were used to weight or combine the studies?
5. Reporting on methods and results of synthesis or review.
 - Completeness -- Did the report include an explicit presentation of the methods used to select and analyze the literature?
 - Consistency -- Did each review (or chapter) in the initiative follow the same format for report-writing?
 - Limitations -- Did the report include a discussion of the limitations of the review

procedures or the quality of the evidence?

- Was the reporting user-friendly (e.g. executive summary, variety of media to disseminate)?
- Were recommendations made or were readers left to make up their own minds?
- Were implications for policy, research, economic investments, or practice made explicit?

6. Explicit Health Promotion Aspects

- Was consideration given to the following aspects of health promotion and population health programs?
 - * focus on short-term and intermediate outcomes as well as long-term outcomes
 - * focus on process as well as outcomes
 - * greater focus on populations and communities than on individuals
 - * focus on combinations of strategies rather than single interventions
 - * many disciplines and sectors involved
 - * focus on involving clients or community members in designing appropriate interventions and in research and evaluation processes (e.g. action research and participatory action research)
 - * focus on health promotion values (e.g. optimal health for all, social justice, power-sharing, ecological respect & sensitivity, enrichment of individual and community life--see Kahan & Goodstadt, 2001)
 - * use of qualitative as well as quantitative approaches to research and evaluation
 - * focus on determinants of health and their interactions (e.g. social, economic & physical environments)
 - * focus on health promotion theories and beliefs that are manifested at multiple levels of every project (e.g. health is positive, holistic, multi-level, and strongly influenced by the 'determinants' of health--see Kahan & Goodstadt, 2001)
 - * connected to political and social processes at community and other government levels (with a strong emphasis on building healthy public policy and advocacy strategies).

Phase 3 -- Identification of Challenges and Gaps:

In the third phase, the similarities and differences among frameworks were examined and preliminary challenges and gaps were identified. The challenges were grouped into (1) those which have been addressed successfully by previous synthesis initiatives, and (2) those which remain unresolved. The challenges were presented and discussed with reference to some of the literature on the issues.

Phase 4 -- Interviews with/survey of Selected Initiatives:

Ten of the synthesis initiatives were selected for a follow-up survey. Key individuals for each initiative were contacted by email to either respond to an email questionnaire, to give the name of someone who could respond, or to arrange for a telephone interview. Of the 10 contacted, two were interviewed by telephone, and five responded by email. Their opinions were solicited with respect to the strengths and weaknesses of their initiatives, lessons learned, outstanding issues, recommended next steps, and their initiative's policy impact. In addition, a senior experienced

government bureaucrat was interviewed regarding the requirements of policy-makers for evidence, particularly with respect to health promotion. Responses were collected from an individual linked to:

Health Promotion Effectiveness in Alberta

The Cochrane Collaboration

International Union of Health Promotion and Education 1999

US Guide to Community Preventive Services

Evidence for Policy & Practice Information Coordinating Centre (UK)

International Best Practices in Heart Health, Ontario Heart Health Resource Centre, 1998

Ontario Public Health Research, Education and Development Program

Phase 5 -- Policy Implications and Next Steps:

Based on the challenges and strengths of the previous synthesis initiatives in relation to health promotion, and the key informant interviews, recommendations for research and policy in the Canadian context were made. The conditions for developing a specific set of procedures for conducting syntheses in the health promotion field were identified and steps were recommended for developing an ideal model or framework.

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APPENDIX D.

The Implications of Health Promotion Characteristics for Economic Analysis Relevant to Health Promotion

Key Characteristics of Health Promotion Initiatives/Studies	Implications for Economic Analysis
focus on short-term and intermediate term outcomes as well as long-term outcomes	Economic evaluations are largely goal-based but often they treat the process of achieving the outcomes like a “black box”. (1) The logic model would have to explicitly focus on short-term and intermediate outcomes and their valuations, linked to theory and process. On the other hand, it is common to criticize economic evaluations of health promotion because they tend to prefer short-term outcomes and face more challenges around discounting for long-term outcomes. Other things being equal, discounting reduces the benefits of health promotion and/or increases its apparent cost relative to clinical evaluations because the costs are incurred today but the benefits are enjoyed later. (4) Discounting is a value judgement and more systematic enquiry into public opinion is required. (4)
focus on processes as well as outcomes	Already very outcome-oriented. Economic evaluation would need to shift consciously to give more attention to processes but there would be no problem costing process indicators.(1)
focus on populations and communities more than individuals	This feature requires outcome measures for populations and communities and methodology quality criteria which are appropriate to populations. Economic evaluations already try to assess the effects of policies and other interventions on individuals and populations. However, most of the criteria for judging research design quality have been developed from clinical trials of individuals rather than population studies. Sometimes valuation is affected when a large societal benefit is small for each individual and results in lower values for “willingness to pay,” although valuations of benefits received by others can be included as part of the calculations. When the theory underlying the intervention clashes with the individualism inherent in most economic practice, problems arise (e.g. community capacity building is dismissed as an intrinsic benefit). (4)
focus on combinations of strategies rather than single interventions	Requires a broadly defined set of policy targets and then an assessment of which policies or combinations of policies are best suited to achieving the goals. (1) The temptation to single out interventions (or their components) to identify the marginal effects needs to be resisted when a program will only work if all components are placed together. (4)

<p>many disciplines and sectors involved</p>	<p>Economic analysis can be intersectoral in that the efficiency of an intervention is determined relative to all other potential uses of the same resources (2) Various stakeholders need to be engaged in the economic evaluation process (e.g. in defining goals, theories in use, and evaluation design). (1)</p>
<p>focus on involving clients or community members in designing appropriate interventions and in research and evaluation processes</p>	<p>Stakeholders can be involved in ways not normally considered in most economic evaluations. Stakeholders could be involved directly in the evaluation process (1) or studies where this has happened could be recognized. In addition, with programs which have lots of participant involvement, individual studies need to include indirect costs as part of the program cost calculation. (3)</p>
<p>focus on health promotion values (optimal health for all, social justice, power-sharing, ecological respect & sensitivity, enrichment of individual and community life, Kahan & Goodstadt, 2001)</p>	<p>No reason why values such as fairness, justice and empowerment cannot be incorporated within the standard economic framework. (1) Distributional and other equity issues are not an integral part of standard economic analysis although they can be accommodated. (1)</p>
<p>focus on health promotion theories & beliefs which are manifested at multiple levels of every project (e.g. health is positive, holistic, and multi-level, Kahan & Goodstadt, 2001)</p>	<p>Health promotion theories and beliefs need to inform the analytic framework used for analysis and synthesis — setting up models for measuring short and long term outcomes, conditions of success, logic models, and appropriate processes. The theoretical underpinnings of research have been emphasized in economic evaluations, although many are still method-driven. (1) Economic evaluations need to be especially aware that health promotion theories have undergone evolution over time thereby affecting the targets and types of interventions. (3)</p>
<p>focus on determinants of health and their interactions (e.g. social, economic & physical environments)</p>	<p>Determinants of health could be part of the expected policy outcomes and goals. The challenge is to quantify the value of these to society and individuals (either in monetary or non-monetary terms). Social, human and natural capital work in conjunction and issues that affect one invariably affect other forms of capital. Understanding these interactions is very important and economic analysis needs to pay more attention to this area. (5)</p>
<p>use of qualitative as well as quantitative approaches to research and evaluation</p>	<p>Economic evaluations seem to be reliant on quantitative methods of evaluation and reluctant to incorporate qualitative evidence. Sometimes a piece of analysis is not deemed an economic evaluation if it does not include a fully quantified and preferably monetized estimate of costs and outcomes. It is challenging to do a comprehensive assessment of costs and outcomes, some of which cannot be quantified (e.g. experiences of unpaid caregivers). Thus a range of techniques, including qualitative and quantitative methods, depending on the situation, need to be employed. (1)</p>

connected to political and social processes at community and other government levels (with a strong emphasis on building healthy public policy and advocacy strategies)	This is arguably the major contribution of economic evaluations and one of its strengths — to connect social processes to government policies via comparing costs and benefits across sectors.
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(5) Bonnie Brush, Economist, University of Calgary, private correspondence in relation to this analysis, June 18, 2001.

APPENDIX E.
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