

The Skin Cancer Prevention Framework: A Comprehensive Tool for Population-level Efforts in Skin Cancer

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ABSTRACT

The Skin Cancer Prevention Team (SCPT) required a comprehensive approach for guiding its efforts in population-level skin cancer prevention. After identifying and reviewing several models, it concluded that an appropriate population-level model applicable to the Alberta context did not exist. Thus, the SCPT, under the Alberta Health Services – Cancer Prevention Program, developed and evaluated a model for Alberta. Three inclusion criteria for a comprehensive framework were identified: 1) use an ecological approach to population health; 2) function as a dynamic tool for planning, implementing and evaluating population-level efforts; and 3) address weaknesses in existing theory in population health and health promotion. Theoretical constructs were layered together, on the basis of the criteria, to develop an omnibus framework. The resulting Framework represents a layering of several constructs used in popular health promotion and population health theories. It merges principles of the realist approach to scientific enquiry with principles of ecological theory. The Framework outlines a three-step, dynamic process for planning, implementing and evaluating population-level efforts. It also provides insight into the larger, unifying influences for changes in health outcomes and the complex mechanisms of behaviour change processes at the population level.

Key words: Skin cancer; prevention; population health; health promotion; population health intervention; theory

La traduction du résumé se trouve à la fin de l'article.

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Rising rates of skin cancer incidence, morbidity and mortality are a global problem. In Alberta, approximately one in three new cancer cases is attributed to skin cancer. In 2006, 5,826 new cases of non-melanoma (squamous and basal cell) skin cancer were diagnosed, and a total of 23 deaths were recorded. There were 508 new cases of melanoma and 73 deaths attributed to this skin cancer that same year.¹ While mortality from skin cancer is rare compared with other cancers, the treatment-related costs of this disease are substantial (and preventable). Furthermore, in skin cancer patients there is an increased risk of a second primary cancer.² Thus, the Skin Cancer Prevention Team (SCPT), under the Cancer Bureau, Division of Population and Public Health, Alberta Health Services, identified the need for a comprehensive framework to guide population-level skin cancer prevention.

Intervention efforts aimed at chronic disease prevention require an understanding of factors that influence population health outcomes. These interventions must be informed and guided by theory. Theory helps to identify target groups and change strategies, as well as determine program timing and the population-level indicators that are used to evaluate success.³

For over 25 years, Australia has led the way in skin cancer prevention efforts and has developed several multi-component models and frameworks.^{4,5} The World Health Organization (WHO) also has a model to explain the causal factors of skin cancer.⁶ In the United States, the Centers for Disease Control and Prevention (CDC) has created an analytic framework for media interventions in skin cancer prevention.⁷

The SCPT studied several existing models and frameworks in search of finding one that would fit its needs for strategically planning, implementing and evaluating population health interven-

tions for skin cancer prevention. Existing models from Australia, the WHO and CDC provided guidance in some aspects, but they were not sufficiently comprehensive to describe, explain and formalize the synergistic relationships among all components of an intervention that can predict and prevent population-level skin cancer outcomes in Alberta. According to Merzel and D'Afflitti,⁸ the lack of attention paid to the synergistic relationship among specific causal mechanisms in population health issues was found to be a major pitfall of community intervention efforts that failed to demonstrate success. Several of the models identified strategies for promoting sun safe behaviours, as well as target settings and locations to facilitate intervention delivery. However, none was able to accurately identify and include specific evidence-based mechanisms of change that precipitate sustained improvements in population-level skin cancer outcomes. Thus, the SCPT concluded that a comprehensive, integrated model was needed.

The SCPT developed a comprehensive framework to function as a guide for future population-level efforts in skin cancer prevention in Alberta, with potential for application in other jurisdictions. Behaviour change processes are complex in nature and require

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complex interventions to bring about change at the community level. In the past, several community intervention efforts that focused on behaviour change related to chronic disease prevention have been implemented with comparatively limited success.⁸ Taking into account these findings, the SCPT determined that the framework must incorporate ecological theory to facilitate change contingent upon context. Understanding the intervention in context facilitates interpretation of its potential impact.⁸ Second, the comprehensive model must provide a process for moving through different and dynamic stages of prevention activities (planning, implementation and evaluation). Finally, the framework should account for weaknesses in previous theories and models developed for population health approaches. This article is not intended to be a systematic review of existing models. It focuses on how this Framework was developed and, most importantly, explains its utility in skin cancer prevention efforts at the population level.

METHODS

Development and design of the Skin Cancer Prevention Framework

The SCPT studied existing skin cancer prevention models, as well as popular theory in health promotion and population health. This included a close examination of popular planning tools, such as PRECEDE-PROCEED,⁹ the Population Health Template working tool,¹⁰ as well as ecological theory,¹¹ social change theory,¹² complexity theory,¹³ the population health model,¹⁴ the transtheoretical model,¹⁵ the theory of planned behaviour,¹⁶ social cognitive theory¹⁷ and realist theory.¹⁸ The SCPT Framework was developed through an evolutionary process, whereby different theoretical constructs were integrated and evaluated on the basis of three criteria: 1) determine which planning frameworks best fit our needs; 2) determine which combinations of the different planning frameworks were most suitable and theoretically sound; and 3) assess the feasibility of the comprehensive framework for program development and planning. Specific theoretical constructs were included according to their recognition of the factors influencing population-level health outcomes and their meaningfulness with respect to skin cancer prevention. Constructs that focused solely on individual-level behaviour change were excluded. The elements of these theories and planning frameworks, as seen in Figure 1, were selected to guide, provide support for and inform the development of the Framework. The resulting Framework is described in more detail in the next section.

RESULTS

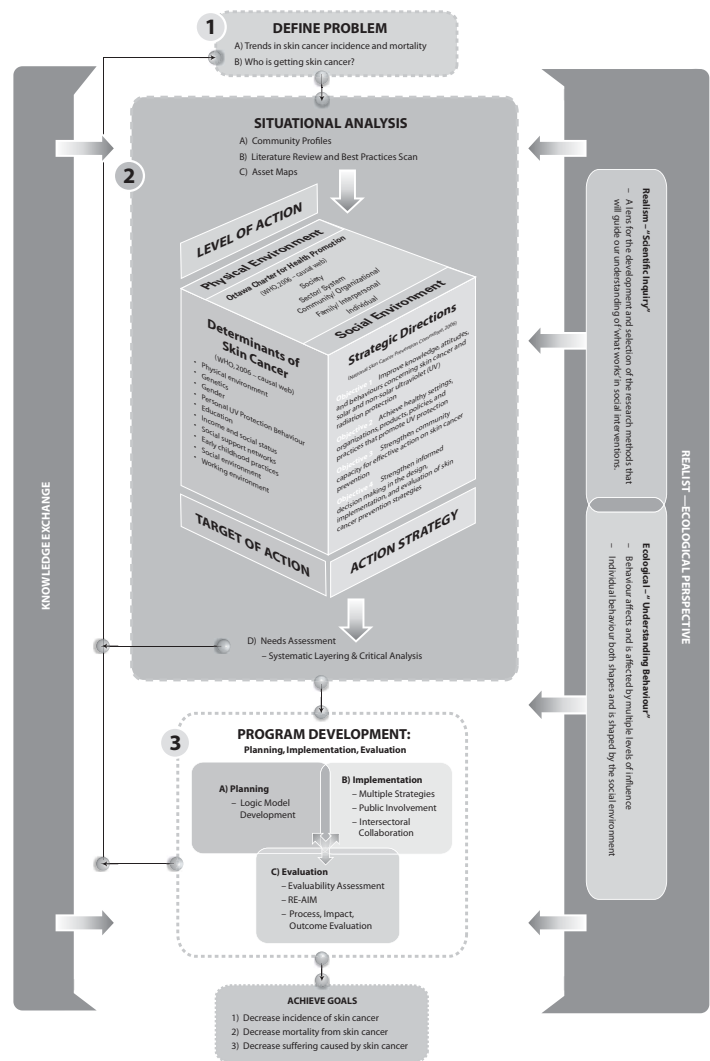
The Skin Cancer Prevention Framework

The model, entitled the “Skin Cancer Prevention Framework” (Figure 1), is the result of a series of discussions and critical appraisal by the SCPT. This section describes the Framework, including the existing models/theories that were used in its creation and at what stage.

Realist-Ecological Perspective

The realist perspective asserts that the “same” intervention can never be implemented in a manner identical with what was originally intended and that the particular plan for success in one context may not work in another.¹⁸ Consistent with the realist

Figure 1. The Skin Cancer Prevention Framework



perspective, the ecological perspective emphasizes the interaction between, and the interdependence of, the different factors within and across all levels of a health issue. Ecological theory defines the linkages between communities of people and the social environment, and it helps identify the broad determinants that influence population health outcomes.^{11,19} Both the realist and ecological perspectives are congruent in emphasizing interdependencies in the social environment. The SCPT emphasized using this realist-ecological perspective to fill the void of other theoretical approaches, as discussed earlier.⁸

How to Use the Framework

On the basis of the Population Health Template, the SCPT selected three key process steps to guide population health interventions: 1) defining the problem, 2) situational analysis and 3) program development: planning, implementation, evaluation. The nature of this three-step approach is dynamic and intended to be sufficiently flexible to respond to new evidence, changes in population demographic characteristics, changes in policy direction, and existing socio-cultural conditions. For all three steps the Framework drew on the realist-ecological perspective with its emphasis on sit-

uational context and social, cultural and environmental interdependencies. A “problem” cannot be defined in the absence of an understanding of these contextual issues. Similarly, the situational analyses were informed by contextual factors that shaped the design and implementation of different interventions in different settings. Finally, planning, implementation and evaluation activities require a thorough understanding of any situational/contextual factors that may influence how programs can be designed, delivered and measured for success. The Framework also recognized the need to incorporate knowledge exchange as an ongoing and critical process.²⁰ While the steps are sequential, each step should be considered during the planning and implementation of the other steps in the Framework.

1. Defining the problem

The Population Health Template started by affirming that a population health approach assesses the health of the population over the lifespan at an aggregate level.¹⁰ It implied that before any in-depth analysis of the determinants of a particular health issue was undertaken it was important to define health status and health status inequities. Furthermore, it was important to determine indicators for analyzing health status and health inequities in addition to assessing contextual factors. The first step of the Framework was to define the problem according to two questions implicit in the Population Health Template: 1) “What are the incidence and mortality rates of skin cancer and are they changing?” and 2) “Who is getting skin cancer?” These questions were addressed at regular intervals through ongoing surveillance activities in a population, to monitor progress and adapt programs and policies as needed.¹⁰

A realist-ecological perspective was crucial at this step, since the factors identified as causes of the problem depend on which lens you are viewing it through. The social environment was a key factor that needed to be examined in order to understand the nature of the problem and develop an accurate picture of the context in which an intervention for skin cancer prevention could be developed.

2. Situational analysis

Once the parameters of the problem had been established, an in-depth examination of its elements was conducted. The Alberta Health Services – Cancer Prevention Program conducted a situational analysis, which is defined as “a strategic, multi-layered analytic process assessing community profiles, literature reviews and best-practice scans to identify gaps that will then direct various initiatives in chronic-disease prevention”.²¹ Several categories of information were collected: community profiles, information from a literature review and best practice scan, and asset maps (“maps” of existing programs, policies and services throughout a defined geographic area); these were then subject to systematic layering and critical analysis, called a needs assessment.

This step in the Framework was primarily influenced by *Population Health Promotion: An Integrated Model of Population Health and Health Promotion (PHP)*.¹⁴ To avoid confusion, it is important to point out that this model is different from the Population Health Template. The PHP is a resource for understanding the intersection between population health and health promotion, and a guide for population-based interventions. The model attempted to answer three questions: 1) What should we take action on? 2) How should we take action? and 3) With whom should we act?¹⁴

With regard to the first question, the Framework focused on skin cancer prevention and was based on previous models (i.e., the WHO model, PRECEDE-PROCEED model).

With respect to how we should take action, we realized that the role of the health sector in skin cancer prevention, diagnosis and care was crucial. The prevention of skin cancer is a responsibility that is shared by all. Alberta Health Services recognized the importance of the role health practitioners have in the prevention, diagnosis and care of skin cancer and the role of the person in self-education and self-management; it also recognized its own role to facilitate skin cancer prevention within and across sectors, social settings and groups.

With respect to the third question, in accordance with previous models from Australia we decided to incorporate and discuss the social environment as relationships between the different players involved in the intervention (i.e., local government, manufacturers, health care workers, schools, media, workplaces, communities).

Now that there was more of a focus on population health, health promotion and population-based interventions, a literature review was conducted. In gathering information about the health problem and potential solutions, it is important to conduct a realist review of the literature. Traditional systematic reviews, in contrast with the realist review process, follow a formalized review protocol to achieve a high degree of reliability. A realist review is an iterative process and is more flexible in making comparisons and combining theoretical thinking about interventions with empirical evidence for understanding how others might implement an intervention within their own environmental context.¹⁸

3. Program development: Planning, implementing, evaluation

The third phase of the Framework strategically combined planning, implementation and evaluation in order to create and implement a sustainable programmatic plan for reducing skin cancer. Specifically, this step assessed the logistics of implementing a program by determining the required resources to carry it out.

Once the logistics of implementing a program had been determined and the resources were in place, the program was then ready to be implemented. Multiple action strategies, ongoing public involvement and intersectoral collaboration were incorporated into the Framework as guidance in order to comprehensively address skin cancer prevention.¹⁰ This step was analogous to the administrative diagnosis in the PRECEDE-PROCEED model.⁹

Evaluation planning at this stage was found to be essential. The Framework included three evaluation components: 1) the evaluability assessment, which includes a participatory method for developing the plan in collaboration with stakeholders,²² 2) the RE-AIM framework for outcomes and indicators²³ and 3) process, impact and outcome evaluation, based on the PRECEDE-PROCEED framework.⁹ An evaluation plan and evaluation resources must be identified and implemented at the outset of program planning.^{9,24}

Thurston and Potvin²² proposed that an evaluation plan for a social change program requires a similar process to that used in planning and implementing a program. They further described the term “evaluation” as “a feedback system between the program and its environment”. An important purpose of this feedback system is to produce information that facilitates local program improvement and decision-making. Furthermore, the approaches adopted for

evaluation must be relevant to the work of those coordinating the intervention. To ensure that the components to be evaluated will be valued by the stakeholders, an evaluability assessment should be conducted. This can be described as “a set of procedures for planning evaluations so that stakeholders’ interests are taken into account in order to maximize the utility of the evaluation”. The Framework incorporated this assessment as the first step in conducting an evaluation of skin cancer prevention programs in Alberta, to ensure that the stakeholders involved would find the information from the program evaluation valuable.

In the Framework, as the evaluability assessment took place the RE-AIM evaluation framework²³ (Reach, Efficacy/Effectiveness, Adoption, Implementation and Maintenance) acted as the guide for what should be evaluated in an intervention. RE-AIM also fits well within the realist paradigm, as a primary focus is to assess the “real world” impact of research and its applicability in applied settings. Reach refers to the percentage of participants involved and how representative they are of the target population. Efficacy/effectiveness refers to the intended impacts of an evaluation, as well as the possible unintended consequences of the intervention on quality of life and expected health outcomes. Adoption refers to the participation rates and representativeness of the settings (e.g., workplaces, schools) and the adoption agents (employers, teachers, principals, etc.). Implementation refers to the extent to which various components of an intervention are delivered as intended in real-world evaluations. Finally, Maintenance refers to the long-term impact as well as the sustainability of an intervention.²³ RE-AIM is especially useful in evaluating population health interventions, in that it hypothesizes that the overall impact of an intervention is a function of all five components. Furthermore, it takes into account individual behavioural outcomes, as well as outcomes at the setting or environment level.

According to PRECEDE-PROCEED, a population-level intervention can be evaluated at three different levels: process, impact and outcome. The three different levels of evaluation are to be conducted at different stages in the intervention’s implementation; thus each level has different types of indicators, as well as different ways of collecting data. These indicators and methods selected to collect data should be identified in the first two stages of the evaluation process.⁹

DISCUSSION AND APPLICATION

The dramatic increase in skin cancers in Alberta has precipitated an urgent need for effective solutions. The absence of integrated, theory-guided, evidence-informed approaches to skin cancer prevention led the SCPT to develop a comprehensive framework for planning, implementing and evaluating skin cancer prevention initiatives. The SCPT’s Framework is complementary to the models designed by the WHO and CDC for the prevention of skin cancer. Yet a fundamental difference is that it was founded on theories of behaviour change and health promotion that coincide with a situational analysis of current population health initiatives at multiple levels (i.e., national, provincial, regional and community-based). An examination of these initiatives in terms of their relative successes and weaknesses provided insight into the larger unifying influences of behaviour changes on health outcomes and the complex mechanisms that mediate change processes at the population level. This Framework can be used to guide the development of a specific skin cancer inter-

vention, or it may be used by other cancer control agencies to develop strategic and long-term plans in skin cancer prevention.

As pointed out earlier, this article is not intended as a systematic review, neither is it intended as an original piece of research. Its contribution is an attempt to describe the process that the SCPT has identified as a guide for thinking through how to improve skin cancer outcomes in a large population affected by complex contextual factors.

The SCPT will evaluate the effectiveness of the Framework to understand its impact on skin cancer prevention and its ability to be sufficiently flexible to respond to changing conditions (e.g., changes in population demographic characteristics, policies and available services). The Framework was built on existing resources and community development efforts, and therefore should easily be assimilated into broader population health strategies. It required sufficient multidisciplinary resources to facilitate planning, implementation and evaluation (i.e., the situational analysis, asset mapping and literature review, evaluability assessment, population health promotion, evaluation framework, surveillance and monitoring, and evaluation). This tool may have been limited by the availability of skills and expertise to undertake the essential components of the planning, implementation and evaluation step. It may be adapted to other population health problems that require a comprehensive framework to address population health issues. The strengths of the SCPT’s Framework are its reliance on existing evidence and an integration of population health assessment and behaviour change theories that are sensitive to individual, socio-cultural, demographic, community and socio-political environments.

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RÉSUMÉ

Notre équipe de prévention du cancer de la peau (ÉPCP) avait besoin d'une approche globale pour orienter ses efforts de prévention du cancer de la peau axés sur la population. Après avoir recensé et examiné plusieurs modèles, elle a conclu qu'il n'existait pas de modèle axé sur la population pouvant s'appliquer au contexte de l'Alberta. L'ÉPCP, dans le cadre du programme de prévention du cancer des Services de santé de l'Alberta, a donc mis au point et évalué un tel modèle. Nous avons cerné trois critères d'inclusion pour un cadre global. Celui-ci devait : 1) aborder la santé des populations selon une approche écologique; 2) fonctionner comme un outil dynamique de planification, de mise en œuvre et d'évaluation des efforts axés sur la population; et 3) tenir compte des faiblesses des théories actuelles en santé des populations et en promotion de la santé. Les construits théoriques ont été stratifiés, d'après ces critères, pour former un cadre composite. Le cadre résultant est une stratification de plusieurs construits utilisés dans les théories populaires en promotion de la santé et en santé des populations. Il fusionne les principes de l'approche réaliste de la science et les principes de la théorie écologique. Il définit un processus dynamique en trois étapes : planifier, mettre en œuvre et évaluer les efforts axés sur une population. Il donne aussi un aperçu des grands facteurs qui influencent globalement les changements dans les résultats sanitaires, ainsi que des mécanismes complexes des changements de comportement à l'échelle d'une population.

Mots clés : cancer de la peau; prévention; santé des populations; promotion de la santé; intervention en santé des populations; théorie