Child and Youth Health and Well-Being Indicators Project: CIHI and B.C. PHO Joint Summary Report

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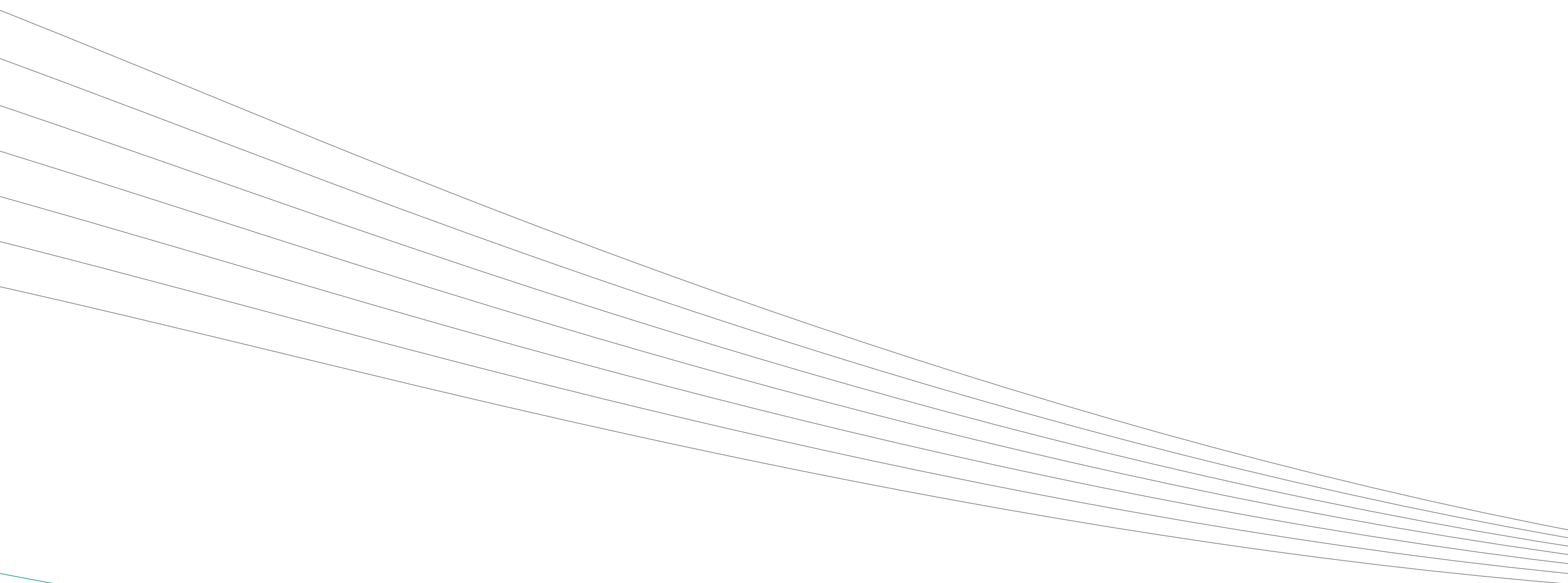
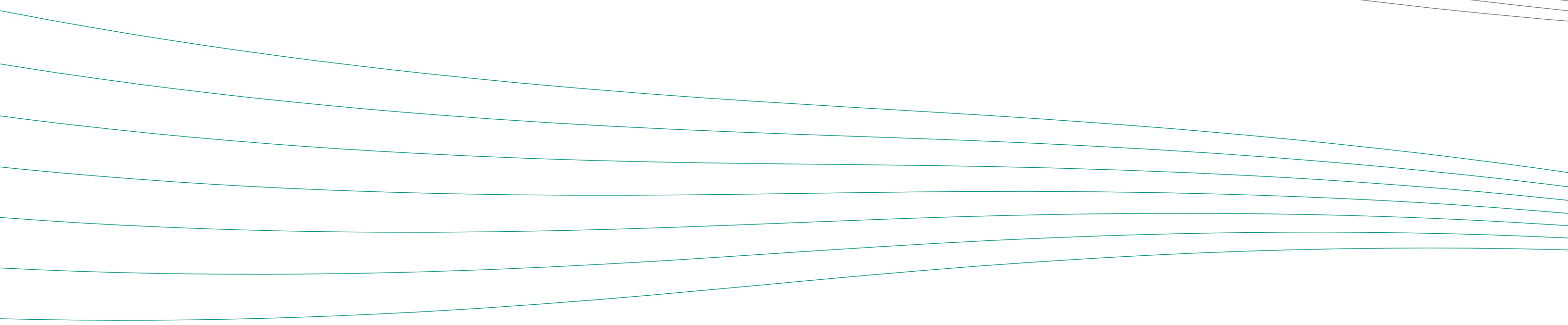

Table of Contents

Acknowledgements iii
1 Introduction 1
1.1 Context and Background 1
1.2 Project Scope 2
1.3 Project Structure 2
1.4 About This Report 4
2 Phase 1: Literature Review and Framework Development 5
2.1 Literature Review 5
2.2 Validation of the Draft Framework and Indicator Selection Criteria 5
2.3 The Framework 6
2.3.1 Discussion on Dimensions 7
2.3.2 Discussion on Ecologies 9
2.3.3 The Final Framework 9
2.4 Criteria for Indicator Selection 13
2.4.1 Guiding Principles 15
2.4.2 Indicator Selection Criteria 16
3 Phase 2: Indicator Selection Process 18
3.1 Identification of Concepts and Indicators 19
3.2 Filter 1: Relevance Assessment 20
3.3 Filters 2 and 3: Evidence Review and Data Assessment 21
3.4 Assigning Concepts/Indicators 23
4 Summary 24
4.1 Summary of Indicator Recommendations 24
5 Lessons Learned 29
5.1 Process Learnings 29
5.2 Evidence Learnings 30
Reference 31

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1 Introduction

How does a society know, from a population health perspective, whether the health and well-being of children and youth are improving, staying the same or getting worse? Since we know that what gets measured focuses attention, programming and funding, which measures—covering which aspects of the lives of children and youth—should be selected? What would a manageable set of indicators to be followed over a 20-year period look like? These are challenging questions to answer given the multiple definitions of child health and well-being and the variety of viewpoints held by the many child and youth service providers on what constitutes child health and well-being.

The Office of the Provincial Health Officer (PHO) for British Columbia is planning for an upcoming report on the health and well-being of children and youth (that is, from birth to age 18, inclusive) in B.C.[i] To answer the above questions, the Office of the PHO partnered with the Canadian Institute for Health Information (CIHI) to identify a set of core indicators to define and track child health and well-being in B.C. This report presents the recommended suite of core indicators for use in the PHO report and summarizes the activities undertaken to identify and select the set of core indicators.

1.1 Context and Background

More than a decade ago, the PHO published a report on the health of children in B.C. At the time, the report was groundbreaking in that it looked beyond physical health and considered how the social determinants of health affected the lives of children. The PHO's vision for the upcoming report is to both build on this holistic view of children and youth and also reflect the best and most current evidence on the contributing factors, modifiable conditions and actions that truly make the most difference to both positive and negative child and youth health and well-being outcomes.

Let us imagine a society where the basic needs of all children and youth are met; where all children live securely, free from abuse, poverty and ignorance; surrounded by love, encouragement and acceptance; growing up with confidence and self-awareness; respecting themselves and others; and motivated to strive to reach their full potential, for the benefit of themselves and/or the community. What core set of indicators will best allow us to track this? Which indicators in which areas of child health and well-being should be followed over time if we want to make the biggest difference possible to those children in a reality of finite human and fiscal resources?

As we know, what gets measured tends to get addressed with policies, programs and resources. By using an evidence-based population health approach, the PHO hopes that the report will inform health system decision-making as it relates to the development of policy, programs and services aimed at improving the lives of children in B.C.

i. Although the interest is in children up to their 19th birthday, we will be using existing data rollouts that may report on youth beyond their 19th birthday.

The PHO's goal is to have a sustainable, solid measurement system that will support consistent and ongoing reporting over many years. It is hoped that the outcomes from this work will support and influence ongoing reporting and monitoring of child health and well-being within the province and at the national level. CIHI will benefit from this work, in that it supports ongoing work on the development of pan-Canadian health indicators and will leverage CIHI's technical and methodological expertise in indicator development.

1.2 Project Scope

This project focused on identifying and selecting a suite of indicators of child health and well-being. To accomplish this objective, the following activities were undertaken:

- A literature review identified the range of issues and factors considered important to the short- and long-term development of children and youth. This included the development of a holistic framework and criteria to guide the identification and selection of indicators.
- A workshop with topic experts who assessed and validated the framework and selection criteria.
- The selected child and youth health and well-being concepts/indicators were evaluated for relevance.
- A methodology was developed and implemented to evaluate the evidence for selected concepts and indicators to support their inclusion in the pending PHO report.
- Technical documentation was developed for each indicator to provide guidance for ongoing data collection and measurement.

The following activities were out of scope:

- Developing new indicators;
- Collecting data for reporting purposes; and
- Preparing the PHO report on the health and well-being of B.C. children and youth.

1.3 Project Structure

The project engaged multiple government ministries and stakeholders involved in the delivery of services and programs, including but not limited to

- The B.C. Ministry of Health;
- The B.C. Ministry of Children and Family Development;
- The B.C. Ministry of Education;
- The B.C. Ministry of Social Development;
- The B.C. Office of the Representative for Children and Youth; and
- Other stakeholders at the national, provincial and regional levels.

Project governance consisted of three supporting bodies:

- The Project Advisory Committee (PAC) was made up of senior government representatives from the health and social ministries and the regional health authorities, child health academics and other content experts. The committee's purpose was to provide overall guidance and direction to the project.
- The Technical Advisory Committee (TAC) was made up of operational staff and methodologists from government, academia and the health information realm. The TAC provided guidance on methodological issues such as survey design and interpretation, as well as on the quality of data sources, definitions, inclusion and exclusion criteria, and other technical aspects related to specific indicators.
- The Project Working Group (PWG) was made up of the Deputy PHO and representatives from the Ministry of Health, CIHI and the Office of the Representative for Children and Youth. The PWG was responsible for the day-to-day coordination and administration of the project and for making recommendations to the PAC.

1.4 About This Report

This report presents the recommended suite of indicators for use in the planned PHO report on the health and well-being of children and youth in B.C. It also summarizes the activities undertaken to identify and select the set of indicators, including the development of an integrated framework and application of indicator selection criteria. Table 1 below outlines the structure of the report and supporting documentation.

Table 1: Report Structure

Report Chapter	Supporting Documentation
Chapter 2: Phase 1 This chapter describes the literature review, including the development of the proposed framework and indicator selection criteria. It also describes a workshop that was conducted to validate the proposed framework and indicator selection criteria.	• Appendix A: Discussion Paper • Appendix B: Workshop Summary Report • Appendix C: Final Framework
Chapter 3: Phase 2 This chapter describes the indicator selection activities, including a modified Delphi process and a series of evidence reviews.	• Appendix D: Relevance Review Questionnaire • Appendix E: Evidence Review Protocol • Appendix F: Physical Health and Well-Being Evidence Review • Appendix G: Mental and Emotional Health and Well-Being Evidence Review • Appendix H: Social Relationships Evidence Review • Appendix I: Economic and Material Well-Being Evidence Review • Appendix J: Cognitive Development Evidence Review
Chapter 4: Recommended Indicators This chapter presents the recommended indicators, including a summary of the rationale for including the indicators in the PHO report.	• Appendix K: Indicator Technical and Methodology Documentation • Appendix L: Gap Measures Summary Documentation • Appendix M: Indicator Summary Tables
Chapter 5: Lesson Learned This chapter summarizes the key project learnings.	

2 Phase 1: Literature Review and Framework Development

2.1 Literature Review

In the first phase of the project, external consultants were engaged to develop a discussion paper based on an extensive review of the Canadian and international literature on the key components of child and youth health and well-being. From this literature review, the authors distilled the commonly recognized elements of child health and well-being and used these elements to create a draft framework on child health and well-being.

The purpose of the framework was to provide an integrated, holistic and structured view of the broad range of factors known to contribute to the health and well-being of children and youth. Over the course of the project, the framework was used to guide discussions with stakeholders about what indicators should be selected for the PHO report. The discussion paper also proposed some criteria to guide indicator selection so that the indicators would be selected in a systematic and transparent manner. This discussion paper appears as Appendix A in the supporting documentation.

In developing the framework, the authors noted that although there is broad-based agreement in the literature as to what contributes to child health and well-being, there is inconsistency in the language used and the way health and well-being are framed. The authors concluded that "many versions of this framework are possible and the choice of dimensions and sub dimensions necessarily depends on the goals for selecting and monitoring indicators."[1]

2.2 Validation of the Draft Framework and Indicator Selection Criteria

To ensure that the draft framework and associated indicators would be relevant for children and youth in B.C., 57 experts, representing various levels of government and sectors relevant to child and youth health and well-being, were asked to attend a workshop to provide feedback on the draft framework, the indicator selection criteria and the proposed indicator selection process. The framework and criteria were presented at a series of plenary sessions; these were followed by break-out sessions through which participants were given opportunities to comment on and critique the material. The workshop feedback (Appendix B) resulted in a revised framework and a fine-tuned list of indicator selection criteria.

In addition to the workshop, input on the draft framework and indicator selection criteria was sought from a variety of other sources:

- The PAC provided feedback from a public policy perspective, with specific attention paid to issues relevant to B.C.
- International experts in both child health and indicator development were asked to give suggestions about internal consistency in the framework structure.

- Feedback on health and well-being indicators from 152 young people in B.C. was obtained through a consultation conducted by the McCreary Centre Society on behalf of the PHO and the Office of the Representative for Children and Youth. Participants identified a number of indicators that they believed are important to understanding the health and well-being of young people, which can be situated within the framework.

In general, feedback on the proposed process for developing indicators, the draft framework and the indicator selection criteria was very supportive. The following is a summary of the suggestions offered by the various groups.

Draft Framework

- Ensure the framework dimensions separate attributes of "being" from interventions.
- Define the ecologies in terms of what makes the most sense for children and youth in B.C.

Indicator Selection Criteria

- Differentiate between the criteria for selecting indicators and the guiding principles for understanding child health and well-being.

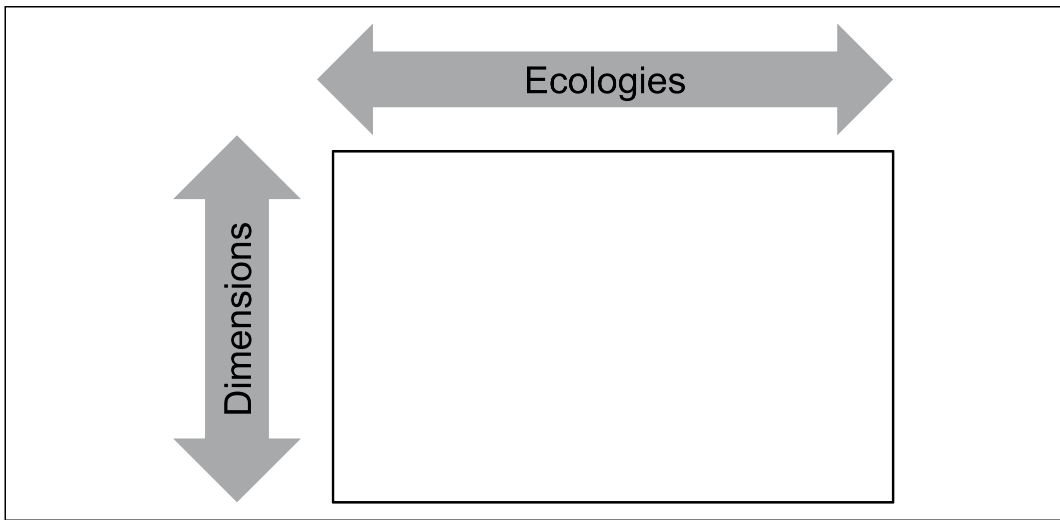
Indicator Selection Process

- Express indicators in ways that can be understood by key stakeholders, including the general public.
- Ensure the consultative process includes children and youth.
- Identify a robust suite of indicators, using transparent processes, in a timely manner, as opposed to trying to develop a definitive set of indicators for all time.

2.3 The Framework

The draft framework identified six dimensions that formulate the foundations of child health and well-being. The literature suggests that improving outcomes in each of these dimensions will improve the overall health and well-being of children. The draft framework also identified a number of environments where children's health unfolds—these environments were labelled "ecologies." These dimensions and ecologies, when combined, formed the structure of the framework as depicted in Figure 1.

Figure 1: Framework Structure



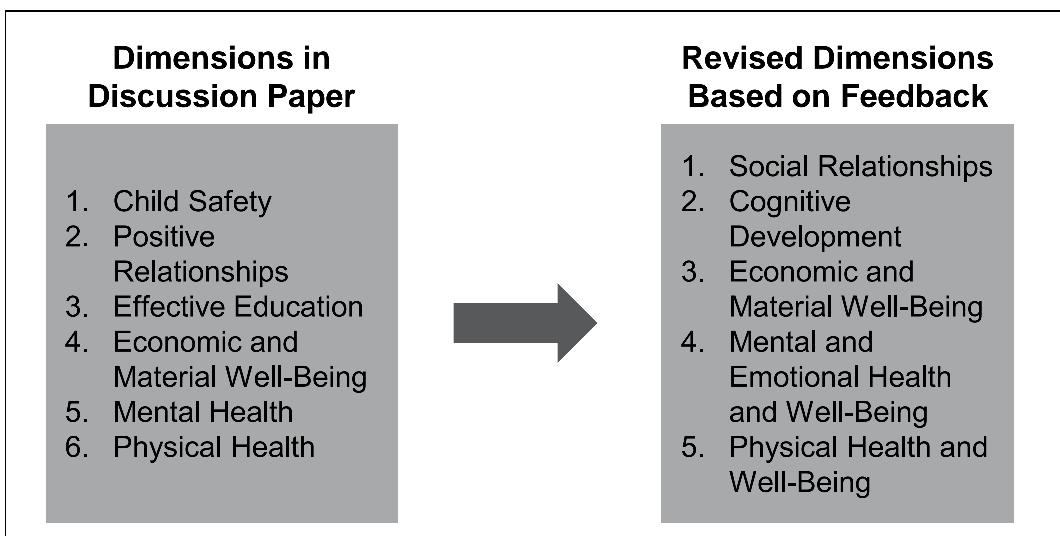
Part of the feedback process, including the workshop, focused on providing greater local definition for the health and well-being dimensions and ecologies contained within the draft framework to address the specific needs and context of B.C.'s children.

As mentioned, the authors of the discussion paper noted that there is considerable consistency in what is considered a priority for monitoring child health and well-being. Thus it is not surprising that the feedback was in general agreement on the importance of the six broad dimensions of child health and well-being proposed in the original framework.

Sections 2.3.1 and 2.3.2 provide summaries of the changes to the proposed dimensions and ecologies that were made based on the feedback from stakeholders.

2.3.1 Discussion on Dimensions

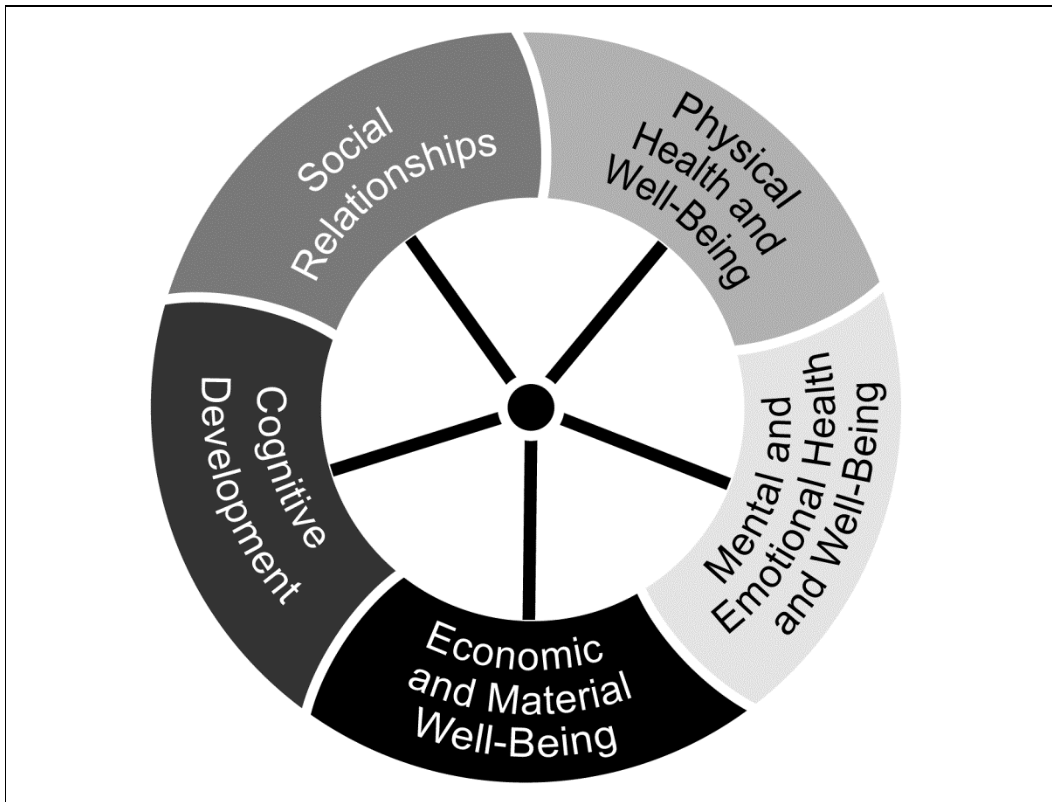
Figure 2: Revised Dimensions



Based on the discussions, it was decided to embed the concept of safety in other dimensions rather than keep it as a separate dimension. While acknowledging that safety is a context rather than a dimension of being, the feedback also emphasized the importance of safety in ensuring the health and well-being of children and the need to specifically address safety within the suite of indicators. In the revised framework, "effective education" was modified to focus specifically on "cognitive development."

Conceptually, we can visualize the critical dimensions of health and well-being that together determine to a significant extent how a child's life will unfold as a tire on a bicycle wheel (Figure 3). A child who has the physical, mental/emotional, cognitive, social relationship and material well-being aspects of his or her life well supported and balanced has a good chance of more smoothly navigating the road of life. Although the relative importance of each dimension will change based on the child's age, environment, biological determinants and personal disposition, a dynamic balance among the dimensions can support the child in reaching his or her potential for the benefit of self and or community.

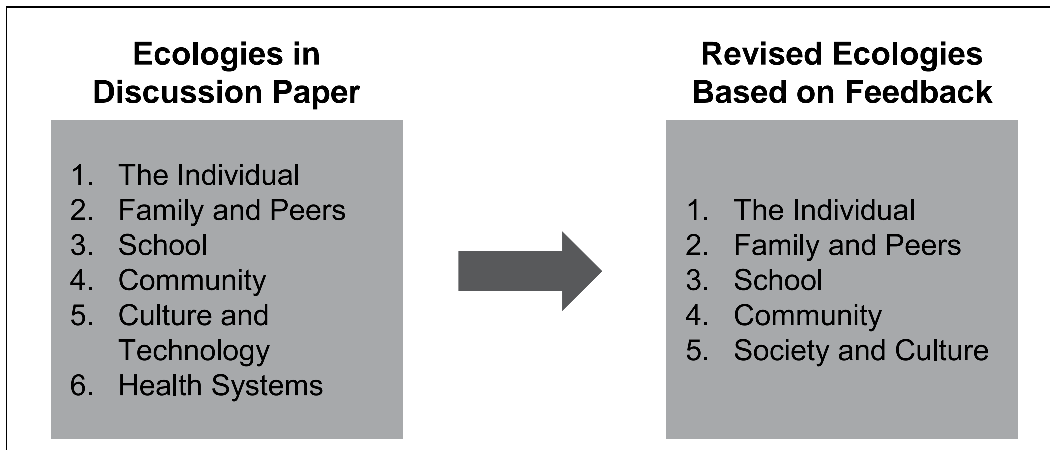
Figure 3: Dimensions of Child and Youth Health and Well-Being



2.3.2 Discussion on Ecologies

The primary feedback with respect to the *ecologies* of the draft framework revolved around the need to ensure that the ecologies are described in a way that makes sense for children in B.C.

Figure 4: Revised Ecologies



Workshop participants suggested that “culture and technology” did not fit as a combined ecology and that “health systems” was too narrow a focus given that larger societal institutions affect the health of B.C. children. Further feedback identified culture as an important foundation that permeates society rather than acting as a separate ecology.

The intent in creating and applying the framework was to locate influences on child health and well-being beyond the community—such as culture, technology and social institutions—into a broader ecology. This is represented in the revised framework through the “society and culture” ecology (see Table 2).

2.3.3 The Final Framework

Table 2 presents the final, approved framework used for the indicator selection process.
The assessment process, described in Section 3, was structured so that each dimension was assessed on its own, as well as in relation to the other dimensions. Concepts within each dimension were assessed as to how well they fit within their specific dimension. This holistic approach supports the population health lens that was originally conceived to guide the overall indicator selection process.

Table 2: Integrated Framework for Situating Child Health and Well-Being Across Ecologies and Over Time in B.C.

Dimensions	Child-Centred Ecologies				
	The Individual	Family and Peers	Schools	Community	Society and Culture
Physical Health and Well-Being					
Mental and Emotional Health and Well-Being					
Social Relationships					
Economic and Material Well-Being					
Cognitive Development					

Dimensions

The following provides a brief description of each dimension as described in the literature and suggested by the workshop participants:

- **Social relationships** with parents, peers, teachers, coaches, etc. are key components of child health and well-being. Such relationships are close, trusted, warm, caring, accepting, affirming and reciprocal. Opportunities for belonging and inclusion in affirming family, peer, school and cultural networks and for engaging in meaningful community actions with others are also central to this dimension. Spiritual connections through religious or personal experiences may also be important for child health.
- **Cognitive development** refers to how children perceive, think about and gain understanding of their world. Important aspects of cognitive development include the acquisition of age-appropriate reading, writing and numeracy skills, as well as decision-making, critical-thinking, problem-solving and self-regulatory learning skills. Another key facet of this dimension is the ability to communicate needs and wants in a socially appropriate manner. From a child's perspective, learning that engages, interests, excites, inspires and also prepares him or her for healthy living and meaningful work may be the most important aspect of an effective education. Equity in the accessibility of learning opportunities from preschool to college—for both formal schooling and extra-curricular activities like art, music and sports—is also crucial.

- **Economic and material well-being** has always included access to nutritious food, adequate housing and warm clothing. However, the indicators of B.C. children's health and well-being goes beyond these basic markers of economic subsistence to also include their access to medicines and health care, the availability of computer technology to enhance learning, and the availability of team sports and extra-curricular and recreational activities to encourage and promote healthy friendships. Access to green space, ancestral territories, cultural activities and libraries are also considered central to healthy lifestyles and child well-being.
- **Mental and emotional health and well-being** is indicated by the presence of personal characteristics such as optimism, positive self-worth, emotional well-being and stability, and perceived safety and security. Children's mental and emotional health and well-being also includes self-regulating abilities such as coping with challenges and stress, goal directedness and an orientation toward the future. As well, it encompasses a capacity for connectedness with other people and with one's culture and community. In addition, freedom from anxiety and depression, early diagnosis and access to mental health treatments are essential to children's mental and emotional health and well-being.
- **Physical health and well-being** includes, but goes beyond, the absence of disease. Core markers of child physical health and well-being include healthy starts (breastfeeding, immunizations, prenatal care and no exposure to alcohol in utero); healthy weight; good eating and sleeping habits; accessible preventive dental care; and screening for developmental, vision and hearing problems. A sense of vitality; opportunities for recreational activities, physical fun and challenges; and access to traditional food sources are also essential. Subdimensions of health also include injury prevention and safe environments, including access to clean air and water.

Ecologies

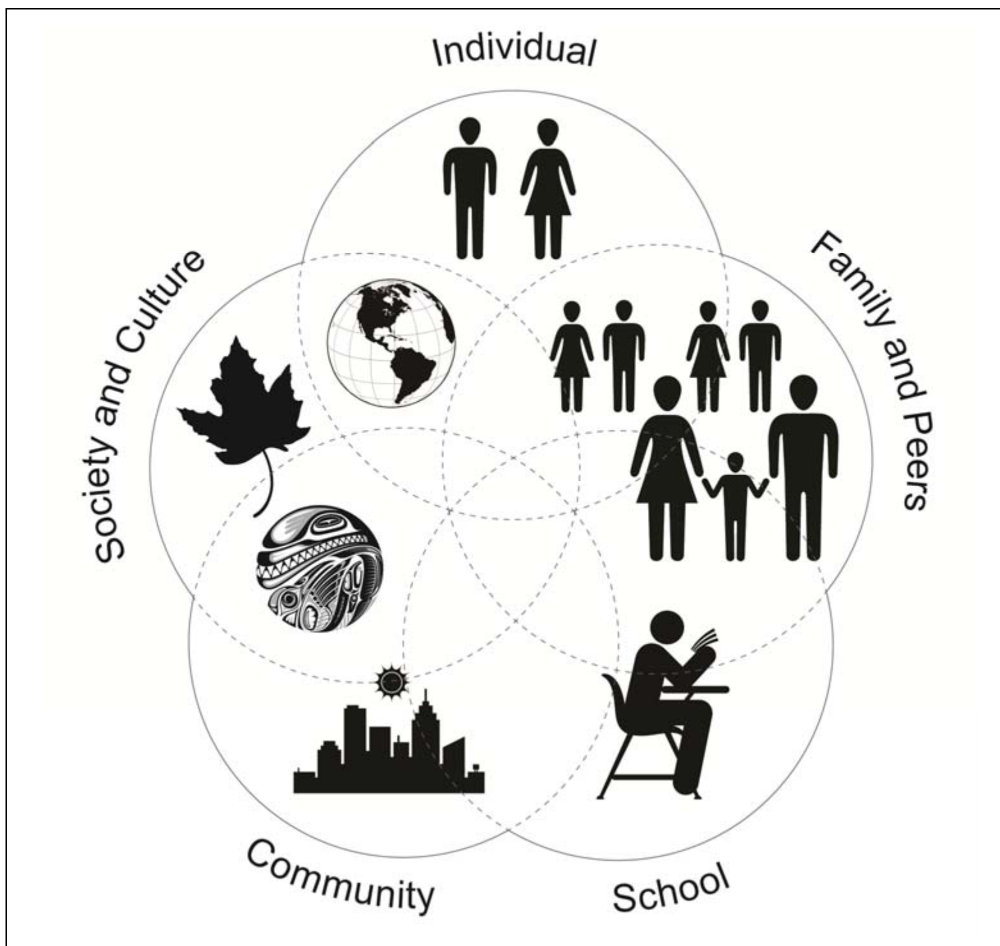
Although children are active agents who can and do shape and respond to the ecological conditions and contexts that they experience, there is little doubt that these conditions and contexts also have a strong influence on child health and well-being outcomes. The *dimensions* of child health and well-being focus attention on what these conditions and contexts are, whereas the *ecologies* can provide information on how these dimensions can be supported (or challenged). Following is a description of each ecology:

- **Individual** factors contributing to child health and well-being stem from individual differences related to genetics, neurological makeup, and health and developmental history, including personal traits such as optimism, curiosity and the capacity for self-regulation.
- **Family and peer ecologies**, including the quality of family relationships, emotional climate, child safety and parenting practices, are universally recognized as being key to children's health and well-being. Support for these relationships throughout development and in every dimension of health and well-being is paramount. Elements prioritized by workshop delegates included openness of communication and the availability of time and opportunities for families to eat, learn, vacation and laugh together. Also identified was the need to address bullying and develop strategies to enhance peer-related inclusion and tolerance.

- **Schools**, daycare and early education settings have a strong impact on the lives of children, given the significant amounts of time spent there. In addition to curricula, effective education needs to meet the social and learning needs of children. Participants acknowledged the importance of the social and emotional dimensions of learning, such as social–emotional capacities to learn in relationships with others, connections to teachers and schools, feelings of belonging, freedom from bullying, cultural sensitivity and inclusion of Aboriginal peoples' and immigrants' content. Schools are communities where children spend a significant portion of their lives.
- **Communities** in which children live also greatly influence their well-being. In addition to the importance of safety and environmental quality, communities provide B.C. children with opportunities for growth, development, connection and engagement through participation in formal and informal programs and activities, including volunteering. The contributions of youth to their communities are further enhanced by youth-friendly public transportation and employers.
- **Society and culture** influence children's lives in terms of education, welfare, justice, employment, housing and the environment through policies, programs, legislation, laws and treaties. An important aspect of culture is that it both forms the relational community where children develop their identity and shapes how children view the world, including their place of origin, ethnicity, form of government, economy, technology and spiritual beliefs and practices.

Ecologies can be visualized as in Figure 5, simultaneously overlapping while both influencing and being influenced by each other.

Figure 5: Ecologies for Health and Well-Being



2.4 Criteria for Indicator Selection

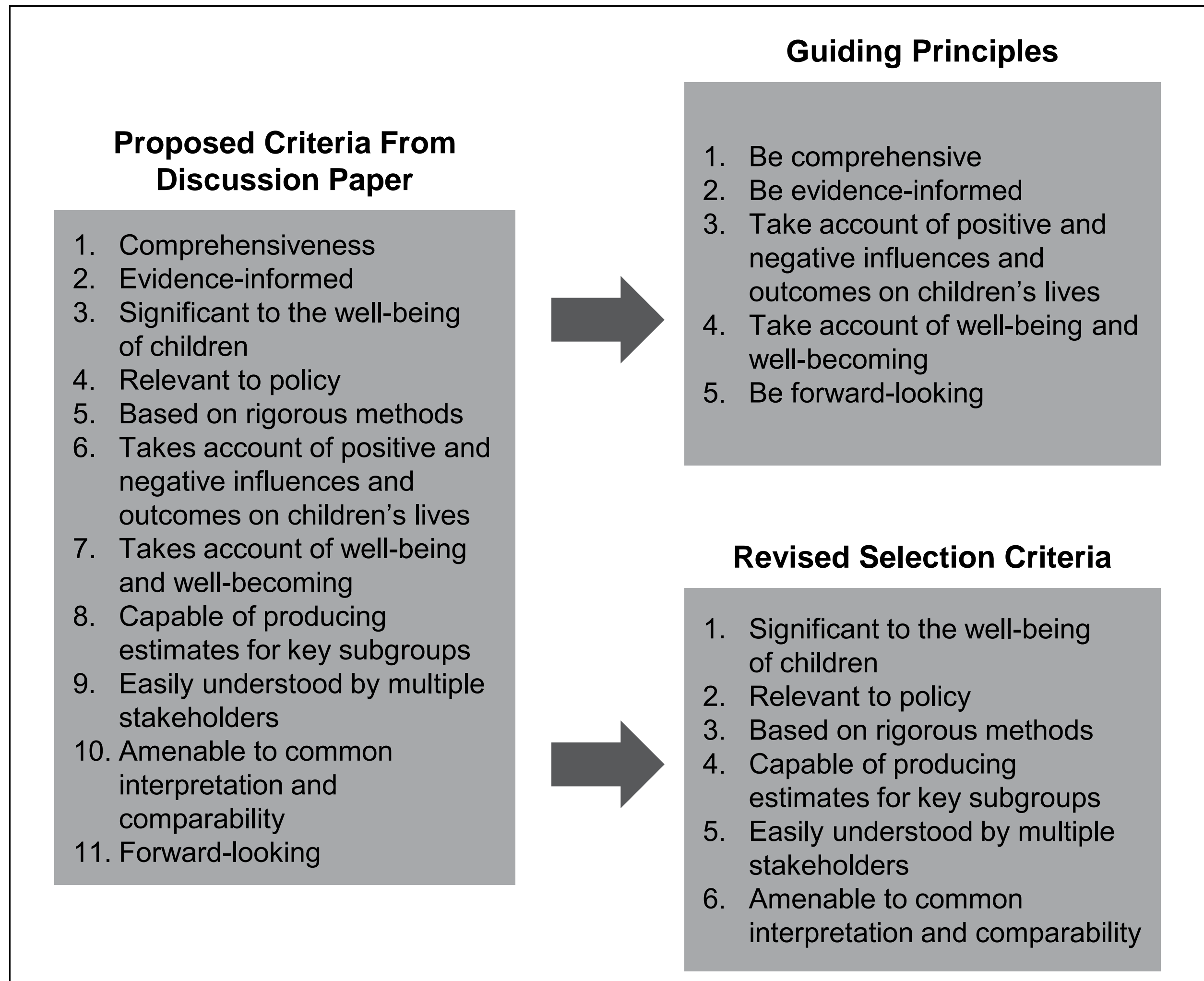
In the discussion paper (Appendix A), the authors proposed specific criteria for selecting the indicators. They cited research demonstrating that indicators have enhanced impact when they are based on agreed-upon selection criteria. These criteria were included as an issue for feedback in the workshop, and participants provided direction that helped focus the criteria.

The workshop participants suggested that some of the selection criteria were more reflective of underlying principles. In their view, guiding principles offered a philosophical backdrop for understanding children's health and well-being, whereas selection criteria needed to be specifically applied in the decision making process. Workshop participants recommended separating principles from criteria to better enable the indicator selection process to reflect the integrated, holistic nature of the framework.

Principles form a set of statements that reflect basic beliefs about an issue and those aspects and approaches that are valued.

Based on this feedback from workshop participants, some of the original criteria were reconceptualized as principles. One of the key factors in this reconceptualization was identifying the need for the indicators to reflect a set of values. Two of the principles—be comprehensive and be evidence-informed—were added based on specific feedback received at the workshop.

Figure 6: Indicator Selection Criteria and Project Guiding Principles



2.4.1 Guiding Principles

The principles are discussed first, in order, to illustrate the over-arching nature of their focus.

- **Be comprehensive:** Child development and wellness is a dynamic process that is influenced by a multitude of processes and factors at both the individual and contextual levels. Children interact with their environment and thus play an active role in creating their well-being by balancing the different factors, developing and making use of resources, and responding to challenges and successes. The context in which children develop has a dramatic influence on their well-being. Therefore, approaching the topic of child health and well-being in a comprehensive fashion requires recognition of the following:
  - Individual child health and well-being consists of multiple domains, including physical, social, mental, intellectual and emotional dimensions.
  - Children are those persons age 0 to 18 years. Age-appropriate indicators are needed throughout the continuum from birth through adolescence and covering the transition into adulthood.
  - The programs and services that children access form a continuum that ranges from health promotion to disease prevention through to brief intervention, treatment and rehabilitation.
  - Numerous systems affect child health and well-being, including the legal, educational, health, justice and housing systems. These systems are dynamic and interdependent, influencing one another and changing over time. In interacting with the different systems and subsystems, children and their families encounter both barriers and facilitators.

    It is valuable to track some of the conditions that are known to be associated with child well-being, such as poverty, housing, neighbourhood characteristics and family structure. These are not, strictly speaking, measures of child well-being but are nonetheless essential for child well-being. They serve as markers of family well-being and constitute an important component of an indicators system.
- **Be evidence-informed:** Being evidence-informed implies that a process of integrating experience, judgment and expertise with the best available research has occurred.
- **Take account of positive and negative influences and outcomes on children's lives:** The set of child health and well-being indicators should provide measures of children's health and well-being as well as measures of impediments or risks to their health and well-being.
- **Take account of well-being and well-becoming:** This principle recognizes childhood as an important era in its own right but also as a crucial period of development from infancy through to adulthood.
- **Be forward-looking:** When developing a set of indicators, give consideration to anticipating the future and providing baseline data for subsequent trends. It is important to determine what areas should be looked at now so that similar data will be available in the future when it is needed.

2.4.2 Indicator Selection Criteria

The following set of indicator selection criteria, as recommended by workshop participants, was endorsed by the PAC and used to select the indicators recommended to the PHO. More detailed descriptions of the criteria, with references, appear in Appendix A.

Criterion 1: Indicators must be significant to the well-being of children. Indicators should measure the things that make the most difference toward improving the well-being of the child population. More precisely, being significant to the well-being of children refers to the combination of the magnitude of the issue being measured (that is, its prevalence) and the impact it has on the health of children (that is, its severity), as well as population-attributable risk and population-attributable benefit.

Criterion 2: Indicators must be relevant to policy. Indicators should be amenable to effective action through policy, programs and services. Risk factors and conditions or supportive factors and conditions must be significantly modifiable.

Criterion 3: Indicators must use rigorous methods. The data should consist of objective statistical measures gathered through sound research techniques.

Criterion 4: Indicators must be capable of producing estimates for key subgroups. Indicators should allow for comparison on the basis of common demographic variables such as age, sex, socio-economic background, location or cultural background.

Criterion 5: Indicators must be easily understood by multiple stakeholders. Indicators should be clear and easily understood by decision-makers, the media, advocacy groups and the general public.

Criterion 6: Indicators must be amenable to common interpretation and comparability. Indicators should have the same meaning in varied population subgroups and be comparable across jurisdictions to facilitate valid comparisons.

Phase 1 Recap

The draft framework was revised as described above, resulting in a summary framework document that incorporates the selected five dimensions (physical health and well-being, mental and emotional health and well-being, social relationships, economic and material well-being, and cognitive development) and the five selected ecologies (the individual, family and peers, schools, communities, and society and culture) of child and youth health and well-being (Appendix C).

The final set of guiding principles for the indicator selection criteria is as follows. The criteria had to

- Be comprehensive;
- Be evidence-informed;
- Take account of positive and negative influences and outcomes on children's lives;

- Take account of well-being and well-becoming; and
- Be forward-looking.

The final set of indicator selection criteria is as follows. The indicators had to

- Be significant to the well-being of children;
- Be relevant to policy;
- Use rigorous methods;
- Be capable of producing estimates for key subgroups;
- Be easily understood by multiple stakeholders; and
- Be amenable to common interpretation and comparability.

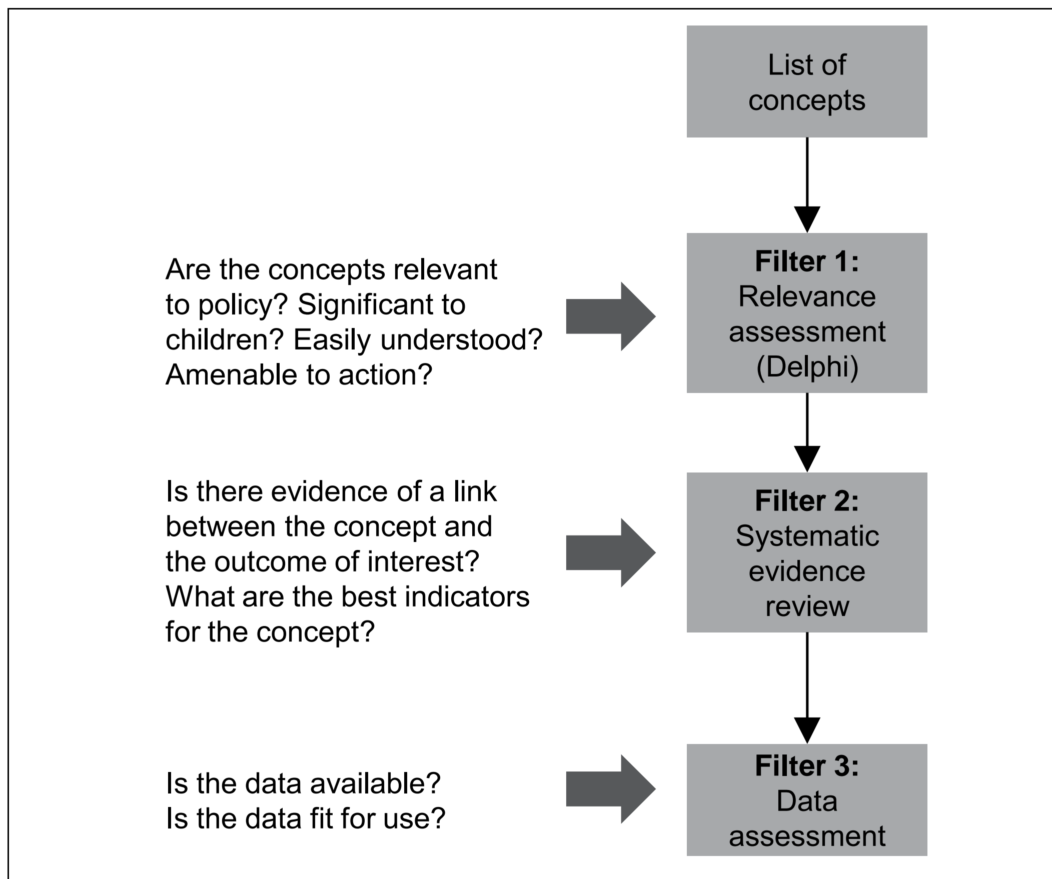
3 Phase 2: Indicator Selection Process

The second phase of the project focused on identifying and then selecting the most appropriate indicators to be included in the PHO report. The two key goals for this phase were

- To identify reportable indicators, that is, those for which evidence exists (for example, indicators are linked to positive or negative outcomes in the literature, strong data exists to measure the indicators) to support their inclusion in the PHO report; and
- To identify information gaps, specifically aspects of the framework for which there is not sufficient evidence to include an indicator or for which indicators may not yet exist. These gaps represent opportunities for future measurement and reporting, which would address issues for which significant gains could be made in health and well-being as suggested by early-stage research.

Figure 7 depicts the process used to identify and select the indicators. The first step in the process was identifying a list of concepts taken from the discussion paper. Three filters were applied to these concepts. The first filter assessed the relevance of the concepts using a modified Delphi approach. The second filter assessed the evidence related to each concept, using a modified systematic review process, including the identification of indicators that could be used to represent the concepts. The filtering order was determined in large part based on efficiency, as well as cost, based on the logic that concepts rejected based on relevance would not be included in the more time-consuming evidence review. The third filter assessed the availability and quality of data needed to measure and report on each indicator.

Figure 7: Indicator Selection Filtering Process



3.1 Identification of Concepts and Indicators

The background paper identified the existence of 2,500 “indicators” from various national and international reports, some of which were indicators, some of which were concepts and some of which were measures. The PWG reviewed these and distilled them down to approximately 240 concepts that represented the dimensions of the framework. In many cases, specific and definable indicators were not identified, so the PWG defined a concept—as noted above—as an area for measurement that may be represented by multiple and possibly overlapping indicators.

For example, one aspect of physical health is the concept of mortality. There are many aspects of mortality that can be represented by different types of indicators. Rates can express the level of mortality among children and youth in different ways (such as infant mortality rates, perinatal mortality rates and various other cohort mortality rates). It is also possible to drill down and measure mortality from a variety of causes (poisoning, motor vehicle crashes, etc.). The PWG determined that concepts, while more general, would be more useful for discussion purposes at this stage of the identification and selection process. Hence the focus of the evidence reviews focused on the concept level.

Working from the original list of more than 240 concepts, the PWG identified 125 as likely candidates for measurement and which would also provide the most comprehensive view of the health and well-being of children and youth. These 125 candidate concepts were approved by the PAC and assessed using the first filter.

3.2 Filter 1: Relevance Assessment

The next step in the selection process was to apply a relevance filter. In examining relevance first, the candidate concepts were assessed against each other, and those deemed less relevant to amelioration through policies or programs did not need to go through the more time-consuming evidence filter.

A modified Delphi process was conducted through an online survey in which workshop participants and other child health experts assessed the relevance of the candidate concepts (Appendix D). Participants were asked to rate each concept, sorted by the five dimensions of the framework, using three of the six selection criteria (described below) and also assessing each one's ability to drive change.

- **Significant to the health and well-being of children:** This refers to the combination of the magnitude of the issue being measured (its incidence and/or prevalence) and the impact it has on the health of children (its severity).
- **Relevant to policy:** Concepts should be amenable to effective action through policy, programs and services.
- **Easily understood by multiple stakeholders:** Concepts should be clear and easily understood by a wide variety of stakeholders, including the general public.
- **Able to drive action:** Concepts are deemed important enough to engage policy or program change.

Survey respondents were also asked to rank the 10 most important concepts within each dimension, providing an additional prioritization of concepts. To ensure that the assessment was as comprehensive as possible, respondents were also encouraged to write in additional indicators if they believed any were missing from those included in the survey. Few participants added additional items and no item was added by more than one participant.

Analysis of rating scores indicated that there was insufficient differentiation of relevance among concepts—essentially, each concept was rated as important. Based on the 5-point rating scale, the average score for each criterion, for each concept, ranged between 3.8 and 4.2. This lack of differentiation made it difficult to determine which indicators were of more relevance than others.

When respondents ranked the concepts a much clearer picture of what they felt was most important emerged. The TAC agreed that the ranking was more useful in identifying what the respondents identified as the most relevant concepts to child health and well-being. Based on this input, the PWG used the ranking of the concepts from the survey to prioritize the concepts. As only those concepts that were considered the most important by the survey respondents were ranked, this approach allowed for the differentiation of the more important concepts.

The TAC also suggested additional methodological considerations for supporting the inclusion of a concept in the next step:

- Concepts should be ordered across the age span of the child and youth population and should reflect issues identified as relevant to those age groups; and
- Concepts should provide information that is relevant to vulnerable populations (for example, First Nations and other Aboriginal peoples, recent immigrants and visible minorities).

In a separate initiative, based on joint work between the PHO and the Office of the Representative for Children and Youth, a series of workshops and focus groups was conducted with young people asking them what they believed to be the most important indicators of youth health and well-being. This information was incorporated into the relevance filter for this project.

After applying all of the four original relevance selection criteria and methodology factors recommended by the TAC, the number of concepts rated sufficiently policy-relevant and, therefore, eligible for inclusion in the evidence review phase was reduced from 125 to 93.

3.3 Filters 2 and 3: Evidence Review and Data Assessment

The purpose of the evidence filter was to apply a rigorous approach for evaluating the quality and strength of the evidence for each of the concepts. The reviews addressed two specific questions:

1. For a particular assigned concept, what recent scientific evidence supports adopting that concept and related indicators in B.C. as a compelling expression or experience of at least one of the five dimensions of child health and well-being?
2. For each concept, what are the pros and cons of the identified means of measuring it, that is, what indicators could serve as indicators of child health and well-being in B.C.?

Based on advice from the TAC, the evidence filter was applied before the data filter. It was felt that the data filter would likely eliminate too many concepts early in the process due to a lack of known data sources. Since one of the objectives of the project was to identify information gaps, evidence was assessed before data availability.

As a first step, a modified systematic review protocol was developed to guide the reviewers to assess the evidence in a consistent and systematic manner. Borrowing from systematic reviews, the approach was designed to be targeted, transparent, comprehensive, relevant, synthetic, evaluative, summative and conclusive.

Content experts with expertise in research methods were engaged to conduct the reviews for each of the five dimensions of the framework. Each expert followed the same protocol (Appendix E), which was designed to minimize the variation inherent in perspectives that exist across different topic areas. As part of the reviews, the reviewers were also asked to assess the availability of data for the concept (that is, to apply filter 3 for data assessment).

Specifically, the research evidence for each concept/indicator was evaluated based on the following criteria. (For details on how these criteria were applied, please see Appendix E.) The criteria listed below reflect some of the original criteria identified at the beginning of the project.

1. **Magnitude:** This refers to the proportion of the B.C. child and youth population to which the concept/indicator applies. It is related to indicator selection criterion 4 (capable of producing estimates for key subgroups).
2. **Significance/impact:** This refers to the association between the concept/indicator and health and well-being overall, with an emphasis on the dimension being examined. It is related to selection criterion 1 (significant to the well-being of children and youth).
3. **Modifiability:** This refers to the degree to which the concept/indicator can be adjudged to be amenable to change through public policy or other intervention. It is related to selection criterion 2 (relevant to policy).
4. **Data availability/validity:** This refers to the availability of routinely and regularly collected, valid data for the component indicator(s) within each concept. It is related to selection criterion 6 (amenable to common interpretation and comparability; that is, it is valid and reliable).

As part of this phase of the filtering process, the data filter was applied after the evidence assessment was completed. For each indicator identified within a given concept, data sources (such as surveys and administrative data) were assessed based on frequency of data collection, population covered and other factors.

Upon completion of the evidence reviews and data assessments, findings were reviewed by the PWG, which either accepted recommendations for proposed indicators or sought further feedback from the PAC or the TAC to support a decision to accept or reject recommendations. This review was a complex process. The PWG was often aware of government data sources the reviewer did not identify that, if they had been identified, would have resulted in a more favourable assessment. Moreover, the evidence needed to be weighed in terms of indicators from overlapping dimensions. Due to similarities in some concepts, there were instances when indicators recommended in one dimension were rejected in another dimension. These inconsistencies required careful scrutiny. Finally, reviews had to be assessed in terms of whether the assessment was marrying the evidence to the concept. For example, the concept put forward for youth justice focused on convictions; however, the evidence review focused on incarcerations.

Feedback From Project Advisory Committee

Feedback from the PAC focused on three main issues. First, the proposed indicators should be relevant to the participating ministries. The PHO plans to report on these indicators in a global report that describes the current state of child and youth health and well-being in B.C. Comparisons will be made with the 1998 report to assess changes over time. As the indicators in the upcoming PHO report will be based on evidence, and data is available for ongoing monitoring, it is anticipated that various ministries will monitor indicators connected with their areas of responsibility. Therefore, the PAC recommended ensuring that ministries engaged in the project in an advisory capacity be able to “see themselves” in the report.

Second, the indicators should be actionable. The PAC recommended that various ministries should be able to take action in relation to each indicator through the development of policies or programs to affect change.

Finally, the set of indicators should be comprehensive in relation to the framework. The PAC recommended that the selected indicators address as many components of the framework as possible and that, if at all possible, each cell of the framework matrix contain at least one indicator. While this may not be possible, given evidence or data limitations, the range of indicators recommended for reporting should cover as much of the framework as possible.

Ultimately, all indicators and evidence (whether accepted or rejected by the PWG) were run by the PAC after the PWG's review; the PAC approved, amended or rejected them after a full explanation, discussion and consultation. The final set of proposed indicators is presented in the next section.

3.4 Assigning Concepts/Indicators

Indicators were assigned to one of three groups during the filtering process, as follows:

- **Recommended for inclusion in PHO report:** If, in the evidence review, the magnitude, modifiability and significance/impact on children were rated as medium and/or high, the indicator was passed through to the data filter. If data availability was rated as high or if the indicator was identified as an existing government priority (an example is hearing and vision screening), the identified indicator was recommended for inclusion in the PHO report.
- **Recommended for inclusion in PHO report as a "gap" indicator:** Indicators were proposed for the gap category generally as a result of one or both of the following: the evidence review suggested that the indicator was important but more clarification was required on how the indicator was to be defined and/or there were significant issues around how to measure the indicator.
- **Recommended for exclusion from further evaluation/PHO report:** Concepts/indicators not rated as important/relevant in the relevance review were excluded from the evidence review and therefore will not be included in the PHO report. Of the remaining concepts/ indicators, if the magnitude, modifiability or significance/impact on children was rated as low in the evidence review, the concept/indicator was not assessed for data availability and will therefore be excluded from the PHO report.

As stated at the beginning of this section, the two main objectives of the indicator selection phase of the project were to identify reportable indicators and to identify information gaps that the PHO could address in the planned report. These goals were achieved based on a mix of the following:

- **Rigour:** This was demonstrated by ratings and rankings from the relevance review phase, the breadth and depth of literature reviewed, and the evidence applied in the development of the background paper and the evidence reviews.
- **Transparency:** Not all evidence that was reviewed was definitive. The manner in which choices and decisions were made with respect to considering the evidence and other considerations for inclusion was clearly laid out and documented throughout the process.

- **Inclusion rationale:** In addition to the six indicator selection criteria discussed above, other factors were considered, including the need to provide a baseline for future reporting, policy considerations, advisory committee input and the need to ensure consistency with the previous PHO report on child and youth health and well-being.

4 Summary

4.1 Summary of Indicator Recommendations

Tables 3, 4 and 5 below summarize the three groupings (recommended, gap and not recommended) of concepts/indicators. These tables include only those concepts or indicators that were included in the evidence review phase of the project. For more detailed information about the indicators, please see the technical documentation presented in Appendix K.

Table 3 presents the indicators that were recommended for inclusion in the PHO report and approved by the PAC. The concept, indicator and definition are included. Further details on these indicators are provided in Appendix M.

Table 3: Recommended Concepts/Indicators for Inclusion in PHO Report

	Concept	Indicator	Measure
Physical Health and Well-Being			
1	Birth Weight	Low Birth Weight	Proportion of singleton term births with low birth weight (less than 2,500 grams)
2	At-Risk Pregnancies	Smoking During Pregnancy	Percentage of women who smoked during pregnancy
3	At-Risk Pregnancies	Alcohol Use During Pregnancy	Percentage of women who drank alcohol during pregnancy
4	Nutrition	Breastfeeding	Percentage of infants who were breastfed for at least six months
5	Nutrition	Fruit and Vegetable Consumption	Percentage of B.C. students in grades 7 to 12 who report having eaten fruits and vegetables the previous day
6	Vision Screening	Vision Screening Rate	Percentage of B.C. kindergarten students who have been • Screened for vision problems • Referred for further diagnostic testing
7	Hearing Screening	Hearing Screening Rate	Percentage of B.C. newborns who have been • Screened for hearing problems • Referred for further diagnostic testing
8	Oral Health	Dental Caries Prevalence	Prevalence of dental caries among B.C. kindergarten students
9	Healthy Weight	Percentage of Children With Healthy Weight	Percentage of 18-month-old children and percentage of students in grades 7 to 12 with healthy weights (between the 3rd and 97th percentiles), as determined by World Health Organization age-/gender-specific growth charts (height and weight)
10	Perception of Own Health	Positive Self-Rated Health	Percentage of B.C. students in grades 7 to 12 who report good or excellent self-rated health

Table 3: Recommended Concepts/Indicators for Inclusion in PHO Report (cont'd)

	Concept	Indicator	Measure
11	Physical Activity	Youth Physical Activity Levels	Percentage of B.C. students in grades 7 to 12 who participate in physical activities for at least 60 minutes, 7 days per week
12	Tobacco Use	Frequency of Tobacco Use	Percentage of youth age 15 to 19 who report smoking occasionally or every day
13	Alcohol Use	Binge Drinking	Percentage of B.C. students in grades 7 to 12 who report having engaged in binge drinking in the past 30 days
14	Drug Use	Marijuana Use	Percentage of B.C. students in grades 7 to 12 who report having used marijuana in the past 30 days
15	Immunization	Immunization Rates	Percentage of students • In kindergarten (age 4 to 6) with up-to-date immunizations • In grade 9 with up-to-date immunizations
16	Chronic Diseases	Asthma Prevalence	Asthma prevalence, by age and gender, expressed as a percentage
17	Childhood Injuries	Severe Childhood Injury Index	Incidence of severe injuries among children and youth age 0 to 19
18	Sexually Transmitted Infections	Chlamydia Incidence	Incidence of genital chlamydia among youth age 15 to 19, expressed as a rate per 100,000, by gender
19	Teenage Births	Teen Birth Rate	Birth rate for females age 15 to 19, expressed as a rate per 1,000 females
20	Motor Skills	Physical Health and Well-Being Skills	Percentage of children identified as "vulnerable" based on the Physical Health and Well-Being domain of the Early Development Instrument (EDI)
21	Infant Mortality	Infant Mortality Rate	Number of infant deaths per 1,000 live births in a calendar year, where an infant is defined as being less than 365 days old
Mental and Emotional Health and Well-Being			
22	Mental Health Disorders	Incidence and Prevalence of Most Common Mental Health Disorders	Incidence and prevalence of the five most common mental health disorders for children younger than 19
23	Self-Esteem	Positive Self-Esteem	Percentage of B.C. students in grades 7 to 12 who report positive self-esteem
24	Mental Well-Being	Positive Self-Rated Mental Health	Percentage of youth (as defined by ages covered in survey methodology) who report "excellent" and/or "very good" self-rated mental health
25	Life Satisfaction	Positive Life Satisfaction	Percentage of B.C. youth age 12 to 18 who report being "satisfied" or "very satisfied" with their lives
26	Suicidal Ideation	Considered Suicide	Percentage of B.C. students in grades 7 to 12 who report having seriously considered suicide in the past year
27	Suicide	Suicide Rate	Rate of child and youth (age 10 to 18) suicide, per 100,000
28	Prescription Drug Use	Most Common Prescription Mental Health Drugs	Annual incidence of the most common classes of prescription mental health drugs

Table 3: Recommended Concepts/Indicators for Inclusion in PHO Report (cont'd)

	Concept	Indicator	Measure
Social Relationships			
29	Relationship With Parents	Positive Parent Relationship	Percentage of B.C. students in grades 7 to 12 who report a positive relationship with their parents, as determined by the B.C. Adolescent Health Survey (AHS) Family Connectedness Scale
30	Relationship With Adults	Trusting Adult Relationship	Percentage of B.C. students in grades 7 to 12 who report a trusting relationship with an adult outside of their family
31	School Connectedness	School Connectedness Rate	Percentage of B.C. students in grades 7 to 12 who report a high level of school connectedness, as determined by the B.C. AHS School Connectedness Scale
32	Community Connectedness	Community Connectedness Rate	Percentage of B.C. youth age 15 to 19 who report a "somewhat strong" or "very strong" sense of community belonging
33	Physical Abuse/Neglect	Physical Abuse/Neglect Incidence	Incidence of physical abuse/neglect, as reported by the Ministry of Children and Family Development (MCFD)
34	Sexual Abuse	Incidence of Sexual Abuse	Incidence of sexual abuse, as reported by the MCFD
35	Children in Care	Children in Care Rate	Rate of children in care at year end, expressed as a rate per 1,000 children
36	Discrimination	Discrimination Rate	Percentage of B.C. students in grades 7 to 12 who report having been discriminated against or treated unfairly because of their race or skin colour in the past year
37	Bullying	Bullying Rate	Percentage of B.C. students in grades 7 to 12 who report having been bullied at school, on the way to and from school or over the internet in the past year
38	Youth Justice	Youth Conviction Rate	Two rates will be reported: 1. Youth justice community rate per 1,000 youth population 2. Youth justice custody rate per 1,000 youth population
39	Constructive Use of Time	After-School Activities	As measured on the Middle Childhood Development Instrument in participating B.C. schools
Economic and Material Well-Being			
40	Low Income	Children Living in Low-Income Families	Percentage of children living in households that report annual household after-tax income below the low-income cut-off, as defined by Statistics Canada
41	Parental Employment	Parental Unemployment Rate	Percentage of children for whom at least one parent reports having been unemployed in the previous year
42	Housing Conditions	Children Living in Families With Poor Housing Conditions	Percentage of children living in families with core housing need, as identified by Canada Mortgage and Housing Corporation
43	Food Security	Unmet Food Needs	Percentage of B.C. students in grades 7 to 12 who report that they go to bed hungry due to food insufficiency in their household
44	Idle Youth	Idle Youth Rate	Rate of youth age 16 to 19 who are neither going to school nor employed

Table 3: Recommended Concepts/Indicators for Inclusion in PHO Report (cont'd)

	Concept	Indicator	Measure
Cognitive Development			
45	Communication	Communication Skills	Percentage of B.C. kindergarten students (enrolled in public school) identified as "vulnerable" based on the Communication Skills and General Knowledge subdomain of the Language and Cognitive Skills domain of the EDI
46	Personal Behavioural Skills	Pro-Social Behaviour Skills	Percentage of B.C. kindergarten students (enrolled in public school) identified as "vulnerable" based on the Emotional Maturity subdomain of the Social and Emotional Development domain of the EDI
47	Literacy	Child Literacy	Percentage of B.C. students in Grade 4 and Grade 7 who meet or exceed expectations on the Grade 4 and Grade 7 Reading Foundational Skills Assessment
48	Numeracy	Child Numeracy	Percentage of B.C. students in Grade 4 and Grade 7 who meet or exceed expectations on the Grade 4 and Grade 7 Numeracy Foundational Skills Assessment
49	English Proficiency	Grade 10 Literacy	Percentage of B.C. students in Grade 10 who pass provincial Grade 10 English exams
50	Math Proficiency	Grade 10 Math	Percentage of B.C. students in Grade 10 who pass provincial Grade 10 math exams
51	High School Completion	High School Completion Rate	Percentage of young people who obtain their British Columbia Certificate of Graduation ("Dogwood" diploma) within six years of entering Grade 8

The concepts presented in Table 4 are those that were recommended as gap measures, that is, those for which the evidence or data was not sufficient to justify inclusion as report measures. It is anticipated that the PHO will comment on potential research to support future measurement and reporting of these concepts and their related indicators.

Table 4: Recommended Gap Indicators for Discussion in B.C. PHO Report

Dimension	Include as Gap Indicator
Physical Health and Well-Being	• Cause-specific disability • Fetal alcohol spectrum disorder • Sleep levels • Cause-specific emergency department use
Mental and Emotional Health and Well-Being	• Family functioning • Stress • Spirituality • Parental mental health status
Social Relationships	• Neighbourhood safety • Children who witness domestic violence • Parental alcohol/substance misuse
Economic and Material Well-Being	• Recreation program registrations • Homelessness • Adequate child care
Cognitive Development	• Early childhood education • Reading by an adult • School attendance

Indicators in Table 5 were rejected during the evidence review phase for a variety of reasons. For example, if the magnitude, modifiability or significance/impact on children was rated as low in the evidence review, the concept/indicator was not assessed for data availability and will therefore be excluded from the PHO report. It was also possible for an indicator to be rejected because a better indicator for that concept was identified in the evidence review. This was common in the economic and material well-being dimension, in which there was considerable overlap among indicators.

Table 5: Indicators Not Recommended for Inclusion in B.C. PHO Report

Dimension	Do Not Include in PHO Report
Physical Health and Well-Being	• Sexual behaviour • Health services accessibility • Major childhood infectious diseases • Newborn screening • Environmental exposures • Antenatal care • Cause-specific mortality
Mental and Emotional Health and Well-Being	• Parenting style and practice • Self-rated emotional health • Self-efficacy • Optimism • Mental health system utilization
Social Relationships	• Child protection caseload • At-risk children and youth supported to stay at home • Social support of parents • Prenatal parental alcohol/substance abuse • Relationship with peers • Youth receiving alternative sentences
Economic and Material Well-Being	• Lone-parent families • Children in families receiving social assistance • Children's socio-economic status circumstances • Family income
Cognitive Development	• Number knowledge skills • Copy and writing skills • English language skills • Education expenditures • Reading as a leisure activity • Early school leavers • Readiness to learn

5 Lessons Learned

Throughout this project, the B.C. Ministry of Health and CIHI focused on ensuring that the process balanced a fair mix of rigour, transparency, objectivity and inclusion rationale, leading to an end product—the set of reportable indicators—that provides as comprehensive a picture as possible of the health and well-being of children and youth in B.C., now and in the future. The key message from this initiative was that evidence is a difficult and complex issue to address. Other learnings, grouped into either the process or evidence category, are discussed below.

5.1 Process Learnings

- **It is important to engage stakeholders:** Health and well-being are diverse concepts. The stakeholders for this project are equally diverse, representing multiple ministries within the Government of B.C., as well as young people, interested academics and clinicians whose research and practice touch on one or more of the facets of health and well-being among children and youth. As much motivation as there may be due to personal or professional interest, it is incumbent on project sponsors and team members to actively engage with stakeholders to secure their active participation. The project team demonstrated a commitment to achieving project objectives, specifically to identifying actionable indicators, by engaging with stakeholders in meaningful ways, using credible mechanisms, at key junctures of the entire process.
- **Inter-organizational/interpersonal trust is key to success:** The broad representation of perspectives and interests among team members, including advisory groups, required a level of trust that ensured dissenting opinion could be voiced. CIHI's expertise in this project was focused on indicator identification and methodology issues. The PHO and Ministry of Health focused on rigour and the importance of evidence. Project advisors provided clinical and policy-relevant perspectives. As with any good team, recognizing the skills brought by all members played a key role in ensuring that trust developed. As well, each organization had a common objective—to develop a suite of indicators that can be used to effectively report on the health and well-being of children and youth in B.C.
- **Thorough groundwork helps ensure future actionability:** Ultimately, success from this project will be achieved when the PHO report is released and ongoing monitoring of the selected indicators is part of the operational plans of the appropriate areas of government. Leading to this vision of success, the project was designed so that each phase provided a foundation for subsequent phases; the rigour and depth of analysis were keys to this foundation. Underpinning all of this work was the thorough literature search and development of the holistic framework, which demonstrates the value in interdisciplinary thought and cooperation.
- **Project participants must be committed:** CIHI and the Ministry of Health assigned resources to this project based on an expectation that the project would be completed within approximately 18 months. As the project evolved, and the requirements to achieve the level of rigour and evidence sought by the PHO expanded, additional time was needed. Given this extra time, the project benefitted significantly from the commitment of team members who were involved from the beginning. The core team remained the same throughout the entire life of the project, ensuring a consistent group of intellectual and experienced personnel making decisions at each step of the project.

5.2 Evidence Learnings

- **Finding evidence took longer than anticipated:** For this initiative, the modified reviews were assigned based on the five dimensions of the framework. Indicator development and theory/construct knowledge require different skills. An understanding of both content and measurement was critical to the success of the evidence assessment process. Additionally, strong theoretical and construct knowledge does not necessarily imply expertise in the context of societal or system intervention through policy, program and service delivery.
- **Finding common language was also time-consuming:** The modified review protocol included very specific and agreed-upon guidelines; however, differences in interpretation of terminologies and definitions still hampered the consistent application of these guidelines across the reviews. This resulted in repeating some reviews entirely and other reviews for specific concepts, which required additional time to complete the project to ensure the reviews were performed to the same standard.
- **Evidence is not consistently defined:** What counts as evidence? Methodologies for collecting evidence can range from gathering anecdotes to conducting randomized controlled trials. Individual perceptions of evidence and the quality of evidence are variable as well. Some bodies of evidence (such as in the physical health domain) may be more established and easier to locate and assess. Recent theoretical developments, due to their relative youth, may not have sufficient evidence to support their relevance.
- **The availability of data is not consistent across the dimensions of the framework:** Data on some aspects of physical health is readily available in multiple forms. However, within the mental health and social relationship domains, data is not typically as readily available, making assessments of evidence more difficult. Therefore, some may observe that some of the physical health indicators are based on more rigorous evidence supported by well-established data. Given the previous learning, however, this is not necessarily the case.
- **Consistency in data across time periods is important:** Building meaningful performance measures also requires consistent data across reporting periods, yet the last few years have seen changes to many major data sets, most notably the 2010 Census. An even bigger risk is that these performance indicators rely on data that may not be available at all in the future. Several major data sources have been discontinued or are being phased out, with no suitable replacement provided. For example, the Participation and Activities Limitations Survey was discontinued in the 2010 Census, even though it was the standard source for information on persons with disabilities in Canada.
- **Determining the relationship between a concept and an indicator is complex:** One of the key tasks for the evidence reviews was to identify specific indicators to represent each concept. Some concepts were more straightforward, and finding these indicators was a more straightforward task. Other concepts were considerably more complex or less well understood. For these concepts, there were significant challenges in identifying appropriate indicators and, in many cases, it was not possible at all, leading to the concept not passing the evidence filtering stage.

Reference

1. CIHI. The Foundations of Child Health and Well-being in British Columbia, 2009. Ottawa, ON.

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