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Monitoring positive mental health and its determinants in Canada: the development of the Positive Mental Health Surveillance Indicator Framework

H. Orpana, PhD (1,2); J. Vachon, MSc (1); J. Dykxhoorn, MSc (1,3); L. McRae, BSc (1); G. Jayaraman, PhD (1,3)

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Abstract

Introduction: The Mental Health Strategy for Canada identified a need to enhance the collection of data on mental health in Canada. While surveillance systems on mental illness have been established, a data gap for monitoring positive mental health and its determinants was identified. The goal of this project was to develop a Positive Mental Health Surveillance Indicator Framework, to provide a picture of the state of positive mental health and its determinants in Canada. Data from this surveillance framework will be used to inform programs and policies to improve the mental health of Canadians.

Methods: A literature review and environmental scan were conducted to provide the theoretical base for the framework, and to identify potential positive mental health outcomes and risk and protective factors. The Public Health Agency of Canada's definition of positive mental health was adopted as the conceptual basis for the outcomes of this framework. After identifying a comprehensive list of risk and protective factors, mental health experts, other governmental partners and non-governmental stakeholders were consulted to prioritize these indicators. Subsequently, these groups were consulted to identify the most promising measurement approaches for each indicator.

Results: A conceptual framework for surveillance of positive mental health and its determinants has been developed to contain 5 outcome indicators and 25 determinant indicators organized within 4 domains at the individual, family, community and societal level. This indicator framework addresses a data gap identified in Canada's strategy for mental health and will be used to inform programs and policies to improve the mental health status of Canadians throughout the life course.

Keywords: *health status indicators, mental health*

Key findings

- The Public Health Agency of Canada developed a conceptual framework for the surveillance of positive mental health and its determinants in Canada.
- Included in 4 ecological levels—individual, family, community and society—were 5 outcomes and 25 determinant indicators.
- The framework provides a structure for positive mental health surveillance data that will inform mental health promotion programs and policies across the life course.
- The framework addresses a key data gap identified in Canada's strategy for mental health *Changing Directions, Changing Lives*.

Introduction

The Public Health Agency of Canada (the Agency) defines mental health as ''the capacity of each and all of us to feel, think, and act in ways that enhance our ability to enjoy life and deal with the challenges we face. It is a positive sense of emotional and spiritual well-being that respects the importance of culture, equity, social justice, interconnections and personal dignity.''[1] Similarly, the World Health Organization (WHO) defines mental health as ''a state of well-being in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community.''[2] The positive dimension of mental health is emphasized in the definition of health in the WHO constitution: ''Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.''[2]

Public health surveillance, one of six core public health functions,[3] is defined as ''the continuous, systematic collection, analysis and interpretation of health-related data needed for the planning, implementation and evaluation of public health practice.''[4] The Agency's surveillance programs monitor and report on a range of topics related to chronic disease, injury and health behaviours, including mental illness and suicide, in the Canadian population. Canada's national mental health strategy, *Changing Directions, Changing Lives*,[5] recommended ''strengthen[ing] data and research to develop a better understanding of the mental health

Author references:

1. Surveillance and Epidemiology Division, Centre for Chronic Disease Prevention, Public Health Agency of Canada, Ottawa, Ontario, Canada
2. School of Psychology, University of Ottawa, Ottawa, Ontario, Canada
3. School of Epidemiology and Community Medicine, University of Ottawa, Ottawa, Ontario, Canada

Correspondence: Heather Orpana, Public Health Agency of Canada, 785 Carling Avenue, Office 523B1, Ottawa, ON K1A 0K9; Tel: 613-878-5011; Fax: 613-941-9502; Email: heather.orpana@phac-aspc.gc.ca

needs and strengths of diverse population groups''[5p81] and ''improv[ing] mental health data collection, research, and knowledge exchange across Canada.''[5p114] As part of the 2013 federal budget, the Government of Canada directed that $2 million be reallocated each year for three years to enhance data on mental health, improve knowledge and foster collaboration. While the Agency has an established mental illness surveillance system,[6] there was no surveillance system focussing on the positive mental health of Canadians in 2013. To address this gap, and in consultation with key stakeholders and experts, the Agency set out to develop a conceptual framework and a core set of indicators for its surveillance of positive mental health and its determinants. The indicators will be used to inform programs and policies to improve the mental health status of Canadians throughout their life course. Although public health professionals as well as policy and program developers and decision makers are the primary audience, we anticipate that the public will be interested because of the increasing attention paid to positive mental health and well-being.

In this paper, we describe the process undertaken by the Agency to establish a Positive Mental Health Surveillance Indicator Framework as well as the rationale for and the principles underlying this project and the progress to date. This includes the conceptual framework and the core indicators for surveillance purposes.

Conceptual framework

To identify existing mental health surveillance frameworks, a librarian conducted a literature search using Embase (1974 to 2013), Medline (1946 to 2013) and PsycINFO using the following keywords and their combinations: *mental health*, *mental disorders*, *indicators*, *criteria*, *method*, *measure*, *policy*, *policies*, *develop*, *surveillance*, *taxonomy*, *framework*, *performance*, *health status indicators*, *quality indicators* and *health care*. Results were limited to French and English articles, and articles that were clinically oriented or focussed on a particular patient population were excluded. Altogether, 88 unique articles were identified for review. An additional Internet search used Google and the keywords *mental health*, *surveillance*, and *framework*.

Components of existing surveillance frameworks were identified, for example, in Waddell et al.,[7] Parkinson[8] and Korkeila et al.[9] although there were no frameworks that focussed exclusively on positive mental health and most of the surveillance frameworks were strongly oriented towards mental illness. In addition, we reviewed population health and health promotion approaches that provided the socioecological organizing structure for the framework.[10-12]

Based on these searches, a conceptual framework, which provided the underlying theoretical foundation for this project, was developed in consultation with Mental Health Commission of Canada (MHCC) experts. This conceptual framework was reviewed by the MHCC Directors and the MHCC's Expert Advisory Council. The framework integrated conceptual elements that were important for describing positive mental health in the population (see Figure 1).

Figure 2 summarizes the steps in the development of the Positive Mental Health Surveillance Indicator Framework.

Four components were integrated into an overarching conceptual framework that provided the base on which indicators were selected.

First, positive mental health was conceptualized as a state of well-being that all individuals, regardless of whether they are experiencing a mental illness, are able to enhance.[5] The concept of positive mental health applies to everyone and therefore holds promise as a mechanism to positively shift the population distribution of well-being.

Second, risk and protective factors, or determinants of positive mental health, were identified as important components of the framework; these factors are the focus of efforts to intervene and improve population mental health.[13]

Third, a socioecological model representing the domains in which these risk and protective factors exist was embedded in the conceptual framework.[8,11] These individual, family, community and society domains are shown in Figure 1. Each domain influences the positive mental health of the population and is considered a potential entry point for interventions that promote mental health.

Fourth, the life course was represented in the conceptual framework because risk and protective factors vary and accumulate and experiences in early life may continue to affect positive mental health in later life.[14] The life course stages identified were childhood (0–11 years), youth (12–17 years) and adulthood ($\geq$ 18 years). While these broad categories are heterogeneous, the decision was made to maintain high-level life course stages, with any further refinements reflected in specific indicators and measures. While all but four indicators are the same in the life course stages, the way these concepts are measured changes according to each stage.

Indicator selection criteria

Once the conceptual framework was identified, each of the framework domains was populated with selected indicators and measures. Indicators were defined as concepts that could be measured and reported on, while measures operationalized the indicators through survey questions, scales or other methods.

Five selection criteria (relevant, actionable, accurate, feasible and ongoing) were used to prioritize the positive mental health indicators and measures. The definitions adopted for these criteria (see Table 1) are widely used to assess indicators.[15] We also chose these to align with the selection criteria used for the Chronic Disease Indicator Framework[16] as well as international indicator frameworks.[17-20] Relevance and actionability were considered within the context of public health programs and policy; accuracy, feasibility and the ongoing nature of the data were considered in the context of the surveillance programs that would collect these data. These criteria were used to select and prioritize indicators as well as to select measures.

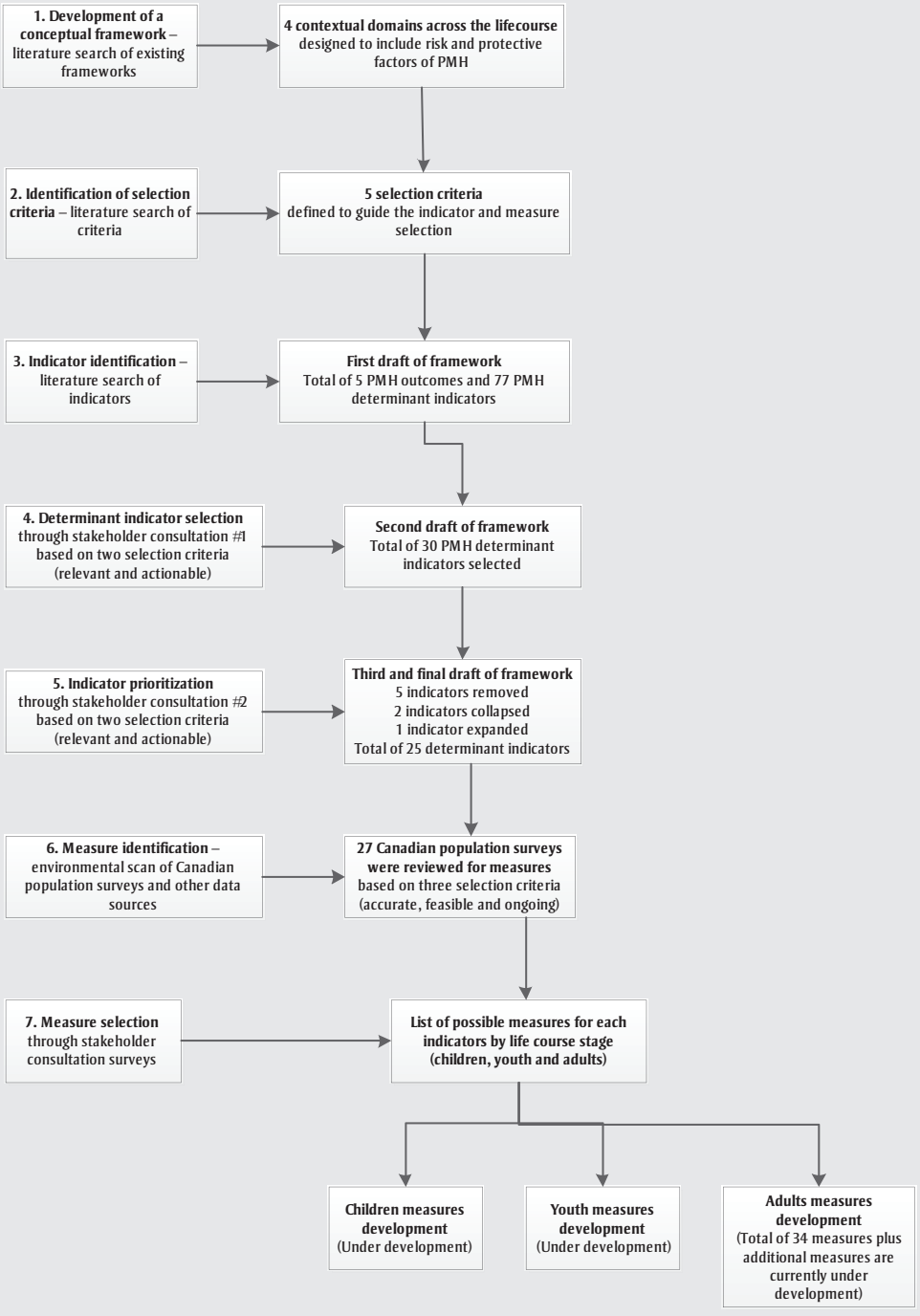
FIGURE 1
Positive mental health conceptual framework for surveillance

Indicator identification and selection

We identified a comprehensive list of potential indicators for a positive mental health indicator framework in the retrieved literature (Figure 1). Where needed, we looked up other relevant literature in support of specific content areas, such as positive mental health outcomes.

First, we identified positive mental health outcome indicators based on contemporary positive mental health and well-being theory, which generally identifies two components: hedonia, or feeling good, and eudaimonia, or functioning well.[21] Hedonia is reflected in measures of positive affect and satisfaction with life (emotional well-being), while eudaimonia taps into functioning well, for example, being able to engage in valued activities and have meaningful relationships (psychological and social well-being).[22] Outcomes

FIGURE 2
Development process for Positive Mental Health Surveillance Indicator Framework



were also chosen to align with the Agency's operational definition of positive mental health.[23]

We then selected positive mental health determinant indicators to capture the risk and protective factors for positive mental health that exist in the individual, family, community and society domains. We identified a number of such indicators in the literature and in other mental health frameworks (for example, Waddell et al.,[7] Parkinson[8] and Korkeila et al.[9]) A thematic synthesis of indicators grouped similar concepts together to streamline the framework and make it more intelligible. We established a clear and concise definition of each indicator as well as an evidence-based rationale establishing the relationship between each determinant and positive mental health.

An initial list of 5 outcome indicators and 77 potential positive mental health determinant indicators was identified (see Table 2).

TABLE 1
Selection criteria for indicators and measures

Selection criteria	Description
Relevant	Provides information that is considered to be meaningful and relevant to the target user.[16-18]
Actionable	Provides information that can inform, influence, or change public health practice or policy.[16-18]
Accurate	Reflects the best evidence. It has to be scientifically sound, valid, reliable, sensitive to change, interpretable and complete.[16-18]
Feasible	Data are available and of sufficient quality to report on or data collection can be put into place at a relatively low cost.[16-18]
Ongoing	Data are collected regularly and trends can be compared over time.[16-18]

Based on previous experiences the Agency had with using a modified Delphi approach to select indicators for the Chronic Disease Indicator Framework[16] and develop national indicators for osteoporosis in Canada,[24] we developed an iterative consultation process that would allow a structured approach to indicator selection while taking into account the views and needs of different stakeholder groups. The primary purpose of surveillance data is to inform public health action; for the purposes of the consultation, stakeholders were considered to be public health professionals working in mental health surveillance, programs or policy both internal and external to the Agency.

Two iterative consultation processes were undertaken to reduce the initial list of 77 determinant indicators to a more succinct list.

First, the Mental Health and Mental Illness Surveillance Advisory Committee, a Canadian expert advisory group that advises the Agency on the development, use and evaluation of mental health and mental illness surveillance information, was invited to an in-person meeting in January 2014. This committee includes members from academia, national organizations and provincial/territorial governments. The committee of 10 was divided into two separate breakout sessions: one group of 5 focussed on indicators in the individual domain, while the other group of 5 focussed on indicators in the family, community and society domains. Both subgroups reviewed the initial list of indicators, discussed the concepts underlying each indicator and provided feedback on reorganizing and prioritizing the indicators. They then reported their findings and decisions to the entire committee. Based on two selection criteria (relevant and actionable), the committee came to a consensus on the primary positive mental health outcomes and the top five determinant indicators in each domain. The indicator list was narrowed to 30 determinant indicators that represented the most relevant and actionable indicators associated with positive mental health.

A second phase of consultation was then conducted with the Mental Health Promotion Task Group, a subgroup of the Healthy People and Communities Steering Committee (HPCSC). HPCSC is one of the three federal/provincial/territorial steering committees that report to the Pan-Canadian Public Health Network Council.[25] This task group is made up of mental health promotion experts from several provincial and territorial governments as well as representatives from the Agency and the First Nations and Inuit Health Branch of Health Canada.

As with the first phase of consultation, the concepts underlying each indicator and the evidence for the associations between the risk and protective factors and the positive mental health outcomes were discussed. The 11 task group representatives were asked to decide if any of the 30 determinant indicators in the revised list were redundant or if any were missing, and then to prioritize indicators. They were asked to use web-based voting technology to select the 5 (out of 12) most relevant and actionable indicators for the individual domain, 3 (out of 7) for the family domain and 4 (out of 8) for the community domain. (The society domain was not part of the selection as it included only 3 identified indicators.) Each chosen indicator received one vote, and the sum of the votes for each indicator was used to rank them from most to least preferred; this ranking was presented back to the task group for validation.

This selection process led to 5 indicators (''Tobacco Use,'' ''Problem Gambling,'' ''Teenage Parents,'' ''Caregiving for a Family Member'' and ''Participation and Volunteering'') being removed from the list of 30 because they received few votes, resulting in 25 determinant indicators. (''Participation and Volunteering'' were subsequently re-included as measures under the community involvement indicator in the community domain). On further review, ''Resilience and Coping'' was separated into 2 indicators for clarity, and 2 other indicators were re-grouped into one, ''Trust and Neighbourhood Social Environment,'' as they had significant overlap when we were identifying measures.

This resulted in a total list of 25 determinant indicators across the 4 contextual domains (individual, family, community, society).

See Table 2 for a comparison of the initial and the final list of indicators.

Measures identification and selection

Once the indicators were selected, we reviewed Canadian population-based surveys to identify measures for each of the indicators. Where relevant, we also reviewed other data sources such as geospatial data. We then assessed the identified measures using three selection criteria (accurate, feasible and ongoing).

Before identifying the measures, we assessed the indicators for their applicability to different age groups. Recognizing that some are more salient to particular life course stages, we identified separate measures for children (0–11 years), youth (12–17 years) and adults (≥ 18 years). ''Nurturing Childhood Experiences,'' ''Parenting Style'' and ''School Environment''

TABLE 2
Initial and final list of positive mental health surveillance indicators

Initial list of possible indicators	Final list of indicators
A. POSITIVE MENTAL HEALTH OUTCOMES	
1.1. Hedonic well-being a. Subjective well-being b. Happiness (positive emotions) c. Life satisfaction d. Emotional well-being	1. Self-rated mental health 2. Happiness 3. Life satisfaction
1.2. Eudaimonic well-being a. Psychological well-being	4. Psychological well-being 5. Social well-being
B. RISK AND PROTECTIVE FACTORS **1. INDIVIDUAL**	
1.1. General health a. Self-rated health b. Self-rated mental health c. Presence of chronic conditions	6. Health status (Self-rated mental health under Outcomes)
1.2. Personal health practices a. Healthy living/personal health practices b. Physical activity c. Sedentary activity d. Healthy eating e. Body mass index	7. Physical activity
1.3. Addiction and health risk behaviours a. Tobacco use/smoking b. Alcohol use/misuse c. Substance use/misuse d. Injury prevention practices e. Sexual risk taking f. Problem gambling	8. Substance use (Alcohol and Drugs)
1.4. Growth and development a. Maternal nutrition b. Supplemental intake during pregnancy c. Breastfeeding d. Alcohol consumption during pregnancy e. Smoking during pregnancy & breastfeeding f. Substance use/misuse during pregnancy g. Exposure to hazards during childhood	3. Nurturing childhood environment
1.5. Biology and genetic endowment a. Biology and genetic endowment	
1.6. Personality a. Self-esteem b. Sense of mastery c. Sense of coherence d. Optimism/pessimism e. Emotional intelligence	1. Resilience 4. Control and self-efficacy
1.7. Spirituality and religiosity a. Spirituality b. Religiosity	9. Spirituality
1.8. Adverse childhood experiences a. Adverse childhood experiences	
1.9. Current stressful life a. Violence (including domestic violence, maltreatment, abuse) b. Discrimination c. Financial constraints/debt management	5. Violence (Discrimination under Society domain)
1.10. Coping a. Coping	2. Coping

Continued on the following pages

TABLE 2 (continued)
Initial and final list of positive mental health surveillance indicators

2. FAMILY	
2.1. Family structure a. Lone parent b. Contact with non-resident birth parent c. Teenage parents d. Parental imprisonment	5. Household composition
2.2. Family relations a. Family relationship quality and connectedness b. Family meals c. Talking to family d. Treatment by parent(s)/parenting style	1. Family relationships 2. Parenting style
2.3. Family general health a. Family mental well-being b. Parental common mental health problems	3. Family physical and mental health status
2.4. Parental health living practices a. Family addictions	4. Substance use by family members
2.5. Caregiving a. Caregiving for a family member	
	6. Household income
3. COMMUNITY	
3.1. Social capital a. Social capital	
3.2. Social support, social provisions, and social networks a. Social support and provisions b. Social networks and social contact	3. Social support 2. Social networks
3.3. Peer and friend relationships a. Interpersonal relationships b. Social engagement	
3.4. Inclusion and belonging a. Social inclusion and exclusion b. Workless households c. Education d. Homelessness	
3.5. School and work environments a. School environment and school achievement b. Workplace characteristics/environment	4. School environment 5. Workplace environment
3.6. Access to and organization of health and social services a. Access to health services including mental health services	
3.7. Participation a. Participation b. Volunteering	(Political participation under Society domain) 1. Community involvement
3.8. Neighbourhood characteristics a. Neighbourhood characteristics b. Neighbourhood satisfaction	6. Neighbourhood social environment 7. Neighbourhood built environment
3.9. Community cohesion a. Community cohesion b. Community connectedness	6. Neighbourhood social environment
3.10. Trust and safety a. Neighbourhood safety/crime/violence b. Perception of safety and crime	6. Neighbourhood social environment

Continued on the following page

TABLE 2 (continued)
Initial and final list of positive mental health surveillance indicators

4. SOCIETY	
4.1. Social justice a. Social justice	
4.2. Equity/equality a. Equality analysis b. Poverty	(Household income under Family domain) 1. Inequality
4.3. Physical environment (Built and natural environments) a. Escape facilities b. Green spaces c. House condition d. Overcrowding e. Noise	(Neighbourhood social environment and Neighbourhood built environment under Community domain)
4.4. Politics and Governance a. Healthy public policy	
4.5. Laws and policies a. Victimization b. Discrimination	2. Discrimination
4.6. Culture a. Culture and values	
	3. Political participation

were included only in the child and youth frameworks; ''Work Environment'' was included only in the adult framework. The adult framework has been completed (please contact the authors to receive a copy), while the child and youth measures are currently under development.

Based on the results of the scan of surveys and other data sources, we identified measures and data sources that could potentially be used to report on the selected indicators at the national level in Canada. We included data sources that were no longer active and for which ongoing data would not be available as well as those sources that focussed solely on specific subpopulations only when no other data sources were identified. In addition to reviewing measures available on existing Canadian population surveys, we reviewed other literature to identify alternate measures for a number of indicators, particularly for those for which no ongoing Canadian data sources exist.

We conducted an online consultation to gather expert and stakeholder advice on the best measures to report on the prioritized indicators. The same groups that were consulted earlier were invited to participate, that is, the Mental Health Promotion Task Group and the Mental Health and Mental Illness Surveillance Advisory Committee, as well as Agency employees in surveillance and mental health promotion. The first phase of the two-phase survey-based consultation focussed on positive mental health outcome measures as well as the measures for the determinant indicators in the individual domain. The second phase focussed on the measures for the determinant indicators in the three remaining domains: the family, community and society domains. The surveys presented the measures identified through the environmental scan of surveys and data sources for each of the positive mental health outcome and determinant indicators, by life course stage (child, youth, adult), where applicable. Experts and stakeholders were asked to use accuracy and feasibility as their primary selection criteria for the measures. The ongoing availability of the data was considered ideal but not necessary.

Three types of questions were asked in the consultation surveys:

1) where an existing measure was identified as the only available data for an indicator, participants were asked for comments on the use of this measure for the framework and if they were aware of additional validated scales or measures;

2) when there were multiple possible measures for the same indicator, experts were asked to choose the measure they believed best reflected the given indicator, or to comment on the suitability and availability of the measures; and

3) when measures had not been identified for an indicator, experts were asked to recommend some, and where possible, their corresponding data sources.

Based on the feedback received, we considered the most accurate and feasible measures, and tried, as much as possible, to choose measures from the same data sources. Where no ongoing source was found, we identified measures from one-time surveys or discontinued surveys, for example, the Survey of Young Canadians and the National Longitudinal Survey of Children and Youth, that could be used for an initial round of reporting and as possible content for future surveys. Measures from these sources were flagged as priorities for data development to support future reporting.

If multiple measures were considered to be accurate, feasible and ongoing,

- measures that had national coverage were preferred over those with partial geographic coverage;
- measures from recent surveys were preferred over those from older surveys;

- measures that fully covered the age range for children, youth or adults were preferred over those with a limited age range; and
- measures that had been psychometrically tested and validated for population surveys were preferred over those where this evidence was not apparent.

If multiple measures met these additional considerations, those from the Canadian Community Health Survey were preferred for adults to facilitate modelling and trend analysis. Similarly, measures from the Health Behaviour in School-Aged Children survey or the Canadian Community Health Survey were preferred for youth over those from other data sources.

During each phase of consultation, additional measures or data sources suggested by stakeholders were reviewed for inclusion in the framework to ensure that it represented the best evidence on positive mental health and its determinants. Data gaps were identified where measures were unavailable or of insufficient quality, and the Agency is proactively collaborating with its partners to identify mechanisms to fill key data gaps.

Two summary reports written by the Agency present the consultation findings to our stakeholders. The first focusses only on the adult framework, while the second reports on the child and youth frameworks.

Conclusions and implications

The Positive Mental Health Surveillance Indicator Framework forms the foundation on which indicators and measures to report on positive mental health among Canadians are selected. The indicators paint a comprehensive picture of the positive mental health outcomes and associated key determinants for children, youth and adults in Canada. Overall, 5 positive mental health outcomes and 25 related determinant indicators within the individual, family, community and society domains have been selected, and associated measures identified for adults. Psychometric analyses indicate that the proposed approach to reporting on positive mental health outcomes is empirically supported.[26] Measures are currently being identified for the child and youth frameworks, and data for youth are expected to be ready for release in 2016.

This work supports the promotion of positive mental health as an important public health activity, and the framework fills an important data gap as identified in Canada's mental health strategy. The aim of the framework is to provide a snapshot of positive mental health among Canadians; it has the potential to inform mental health promotion and mental illness prevention programs and policies at multiple levels. Differences in levels of positive mental health may help identify those groups that could benefit from intervention, and the patterns of risk and protective factors will help inform the nature of those interventions. Based on the analysis of historical data, we anticipate being able to observe shifts, over time, in the positive mental health profile of Canadians.

A major success of this work was the focus on a collaborative approach through the development of strong stakeholder relationships. The creation of the framework relied on collaboration and consultation with provincial and territorial governments, nongovernmental organizations, including the MHCC, and researchers. These relationships ensured that the framework was based on stakeholder needs as well as the best evidence about positive mental health, and that the framework would be able to inform research, programming and policy decisions.

Reporting on the indicators and measures is a priority. The first infographic on positive mental health is available at http://www.phac-aspc.gc.ca/mh-sm/mhp-psm/pmh-smp-eng.php. The Positive Mental Health Surveillance Indicator Framework Quick Stats, 2016 Adult Edition, are also published in this issue, providing the latest data for positive mental health outcomes, and risk and protective factors. An online Infobase will be available in 2016, allowing users to explore data from the framework by key sociodemographic variables such as age, sex, income and immigrant status. We foresee a continued focus on data development to address data gaps and continued improvement of the selected indicators and measures. Additional work is underway to develop a similar surveillance framework for suicide, including its risk and protective factors, many of which are shared with positive mental health. Future work may lead to more outcomes that reflect Canada's mental health strategy, including mental illness and suicide.

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POSITIVE MENTAL HEALTH SURVEILLANCE INDICATOR FRAMEWORK

QUICK STATS, ADULTS (18 YEARS OF AGE AND OLDER), CANADA, 2016 EDITION

INDICATOR GROUP	INDICATOR MEASURE(S)	LATEST DATA	DATA SOURCE (YEAR)
POSITIVE MENTAL HEALTH OUTCOMES			
Self-rated mental health	% of population who self-rate their mental health as "excellent" or "very good"	64.9%	CCHS Mental Health (2012)
Happiness	% of population who report being happy "every day" or "almost every day"	81.9%	CCHS Mental Health (2012)
Life satisfaction	% of population who report being satisfied with life "every day" or "almost every day"	82.1%	CCHS Mental Health (2012)
	Mean life satisfaction rating (0–10 scale)	7.9	CCHS Mental Health (2012)
Psychological well-being	% of population who have high psychological well-being	69.6%	CCHS Mental Health (2012)
Social well-being	% of population who report that they "very strongly" or "somewhat strongly" belong to their local community	62.4%	CCHS Mental Health (2012)
INDIVIDUAL DETERMINANTS			
Resilience	In development		
Coping	% of population who report a high level of coping	56.9%	CCHS Mental Health (2012)
Control and self-efficacy	% of population who report a high level of perceived control over life chances	41.6%	GSS Social Networks (2008)
Violence	% of population who experienced any of three types of child abuse before age 16 (physical abuse, sexual abuse or exposure to intimate partner violence)	32.3%	CCHS Mental Health (2012)
	% of population who report being the victim of physical or sexual assault in the past 12 months	3.9%	GSS Victimization (2014)
	% of population who report being the victim of spousal violence in the past 5 years	2.7%	GSS Victimization (2014)
Health status	% of population who self-rate their health as "excellent" or "very good"	58.6%	CCHS (2013)
	% of population with no or mild disability	68.1%	CCHS (2013)
Physical activity	% of population who are "active" or "moderately active" during their leisure time based on self-reported data	53.8%	CCHS (2013)
	% of population aged 18–79 years who accumulate at least 150 minutes per week of moderate or vigorous physical activity in 10-minute bouts based on measured data	13.6%	CHMS (2009–2011)
Substance use	% of population whose reported alcohol consumption falls within the low-risk alcohol drinking guidelines	85.0%	CADUMS (2012)
Spirituality	% of population who report that religious or spiritual beliefs are "very important" or "somewhat important" in their daily life	62.9%	CCHS Mental Health (2012)
FAMILY DETERMINANTS			
Family relationships	In development		
Family health status and substance use by family members	% of population with a family member who has problems with their emotions, mental health or use of alcohol or drugs	39.8%	CCHS Mental Health (2012)
	% of population with a family member who has problems with their emotions, mental health or use of alcohol or drugs who report that their life is affected "a lot" or "some" by their family member's problems	35.6%	CCHS Mental Health (2012)
Household composition	% of population who live with spouse or partner	70.2%	CCHS (2013)
	% of population who live in a lone parent household	8.9%	CCHS (2013)
	% of population who live alone	15.6%	CCHS (2013)
Household income	% of the total Canadian population, all ages, below low-income cut-off after tax	8.8%	SLID (2011)

INDICATOR GROUP	INDICATOR MEASURE(S)	LATEST DATA	DATA SOURCE (YEAR)
COMMUNITY DETERMINANTS			
Community involvement	% of population who are members of, or participate in at least one recreational or professional organization, group, association or club	63.6%	GSS Social Networks (2008)
Social networks	% of population who report having no close friends or family members	6.1%	GSS Social Networks (2008)
	% of population who report having 1–5 close friends or family members	59.2%	GSS Social Networks (2008)
	% of population who report having 6 or more close friends or family members	34.7%	GSS Social Networks (2008)
Social support	% of population who report high level of perceived social support	94.1%	CCHS Mental Health (2012)
Workplace environment	% of employed population aged 18–75 years experiencing high job strain	14.8%	CCHS Mental Health (2012)
Neighbourhood social environment	% of population who report that their neighbourhood is a place where neighbours help each other	86.6%	GSS Victimization (2009)
	% of population who report that social disorder in their neighbourhood is "a very big problem" or "a fairly big problem"	13.4%	GSS Victimization (2009)
Neighbourhood built environment	In development		
SOCIETY DETERMINANTS			
Inequality	In development		
Discrimination and stigma	% of population who experienced unfair treatment at least once in the past year based on characteristics such as gender, race, age, or appearance	32.4%	CCHS (2013) Discrimination Rapid Response
	% of population with a mental health problem who report being affected by negative opinions or unfair treatment due to their mental health problem	21.0%	CCHS Mental Health (2012)
Political participation	% of registered electors who voted in the 2015 federal election	68.5%	Elections Canada (2015)

Abbreviations: CADUMS, Canadian Alcohol and Other Drug Use Monitoring Survey; CCHS, Canadian Community Health Survey; CHMS, Canadian Health Measures Survey; GSS, General Social Survey; SLID, Survey of Labour and Income Dynamics.

Note: "In development" refers to measures that are under development either because a data source is currently not available or because more research has to be done to identify a promising measure and data source.

Correspondence: Surveillance and Epidemiology Division, Centre for Chronic Disease Prevention, Public Health Agency of Canada, 785 Carling Avenue, Ottawa, ON K1A 0K9; Email: chronic.publications.chroniques@phac-aspc.gc.ca

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At-a-Glance

Emergency department surveillance of injuries and head injuries associated with baseball, football, soccer and ice hockey, children and youth, ages 5 to 18 years, 2004 to 2014

S. McFaull, MSc; J. Subaskaran, MPH; B. Branchard; W. Thompson, MSc

Team sports are a popular recreational activity for Canadian youth. Figure 1 provides an eleven-year snapshot (2004 to 2014) of the number and proportion (per 100 000) of all injuries, as well as the number of head injuries, for children and youth aged 5 to 18 years participating in any of four key team sports: baseball, football, soccer and ice hockey. Data collected from the Canadian Hospitals Injury Reporting and Prevention Program (CHIRPP),[1] an injury and poisoning surveillance system managed by the Public Health Agency of Canada, were used to create the figure (tables available upon request). CHIRPP currently operates in 11 pediatric and 6 general hospitals across Canada using an online data-entry system. The system is dynamic and is updated daily with new cases/information. CHIRPP does not capture all injuries in Canada, only those presenting to the participating emergency departments. However, a number of studies have indicated that the patterns are representative of the Canadian experience in certain contexts.[2,3] Any cases considered non-relevant or containing errors were removed for this analysis.

The average annual percent change (AAPC) in all injuries reported through CHIRPP was calculated (with 95% confidence intervals) for each sport based on methods described by the National Cancer Institute.[4] Over the 11-year period, the proportion of all injuries (number of total injuries per 100 000 CHIRPP cases) due to baseball remained stable. Injuries due to football remained stable overall, but between 2004 and 2008 the proportion of injuries due to football rose at about 7% (95% CI: 3.1–11.0) per year whereas between 2008 and 2014 there was a decrease of 2.2% (95% CI: -3.9 – -0.5) per year. Injuries due to soccer were also stable overall, but did show a 1.9% (95% CI: 0.6–3.2) increase between 2007 and 2014. Injuries due to ice hockey were relatively stable over the 11-year period, but there was a rising trend of 7.7% (95% CI: 5.9–9.6) per year between 2006 and 2011.

Overall, baseball had the highest proportion of reported head injuries (relative to all injuries) at 35.0% (1854/5300), followed by ice hockey at 27.2% (11 423/42 029), football (16.3%; 3635/22 264) and soccer at 15.9% (7326/46 102). Except for baseball, which remained relatively stable, football, soccer and ice hockey show a 42%–47% increase in the proportion of head injuries in 2014 compared to 2004.

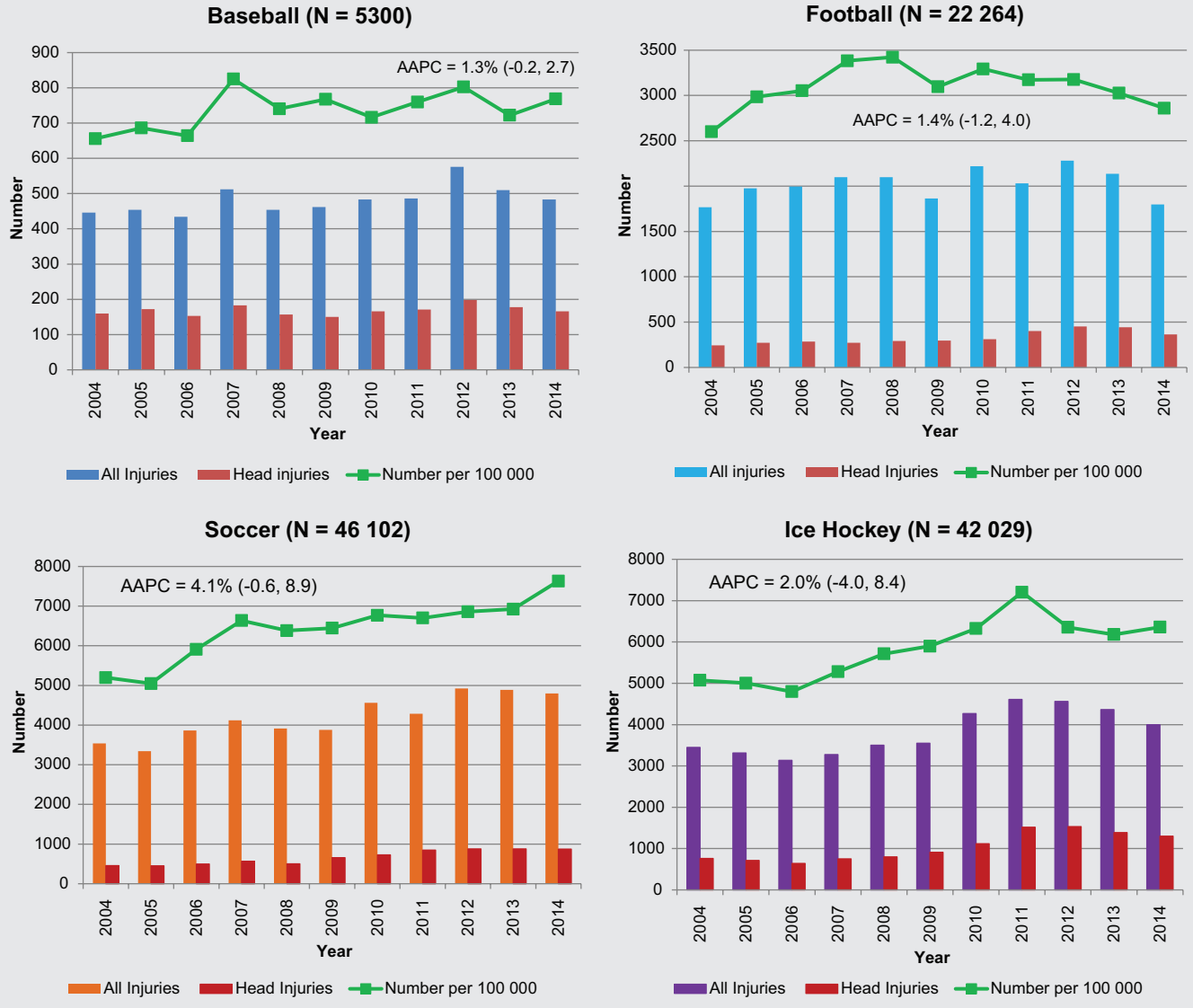
The following limitations are noted: increases in injury reported may be fully or partially explained by increased participation in sport or reporting to emergency rooms and are not necessarily due to an inherent increase in the danger/risk of the sport. Increases in the proportion of head injuries over time may be either due to actual increases in reported proportions, increased reporting through CHIRPP or a decrease in the numbers of non-head injuries.

Author reference:

Public Health Agency of Canada, Ottawa, Ontario, Canada

Correspondence: Steven McFaull, Public Health Agency of Canada, 785 Carling Ave., 6807B, Ottawa, ON K1A 0K9; Tel: 613-404-1881; Email: steven.mcfaull@phac-aspc.gc.ca

FIGURE 1
All injuries, head injuries,[a] and number per 100 000 CHIRPP injuries[b] by sport, ages 5–18, 2004–2014[c]



Abbreviations: AAPC, Average Annual Percent Change; CHIRPP, Canadian Hospitals Injury Reporting and Prevention Program.
Note: The AAPC in all injuries reported were calculated with 95% confidence intervals.
[a] Includes: skull and facial fractures, scalp and facial lacerations, dental injuries and brain injuries (minor closed head injury, concussion and intracranial injury).
[b] Number of injuries per 100 000 CHIRPP cases of all types for the given year, ages 5–18.
[c] As of June 15, 2015. Counts for 2012–2014 are proportional estimates as information is still being entered into the CHIRPP system.

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Other PHAC publications

Researchers from the Public Health Agency of Canada also contribute to work published in other journals. Look for the following articles published in 2015:

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