ENVIRONMENTAL SCAN OF SCHOOL READINESS FOR HEALTH:

DEFINITIONS, DETERMINANTS, INDICATORS AND INTERVENTIONS

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Revised March 2012

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Background:

This report was originally developed for the National Collaborating Centre for Determinants of Health, and initially released in September 2009. This version was updated by the author, Jayne Pivik, PhD.

This resource is made possible through a contribution agreement from the Public Health Agency of Canada to the National Collaborating Centre for Determinants of Health. The views expressed herein do not necessarily represent the views of the Public Health Agency of Canada.

Citation:

Pivik, Jayne (2012). *Environmental Scan of School Readiness for Health: Definitions, Determinants, Indicators and Interventions*. Vancouver, BC, Canada: Human Early Learning Partnership with the National Collaborating Centre for Determinants of Health.

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The information and conclusions identified in this environmental scan are the sole responsibility of the author.

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Executive Summary

Using an ecological lens, this environmental scan explored school readiness from a health perspective. The many definitions of school readiness, determinants influencing school readiness, indicators used to measure readiness and interventions and promising practices to promote school readiness were identified and categorized. The following describes the main conclusions:

- How school readiness is defined is influenced by one's role. Although similarities exist, policy makers, researchers, developmental psychologists, health professionals, educators and parents focus on different aspects of the skills and attributes important for early school success.

- Currently, influences on school readiness consider: the health, social, intellectual and developmental aspects of the child; family functioning, practices and status; neighbourhood influences; community services, programs and opportunities; and societal influences and supports.

- Early childhood is a "prime" time for positively influencing a child's physical, social-emotional and mental health and development.

- Families have the greatest influence on a child's school readiness. Caring, secure and stimulating environments have the power to influence neurological development of the brain; with important and lasting implications for children's capacity to learn.

- Living in poverty is one of the greatest predictors of poor school readiness.

- Determinants of early childhood outcomes also include the family's use of available resources, neighbourhood social capital and social support.

- Environmental toxins, noise pollution, crowding, and housing type can all have a negative impact on children's health and well-being. However, natural settings within neighbourhoods have been shown to be more restorative, reduce cognitive fatigue, enhance positive affect, allow more creative play, help children develop better motor skills, enhance attention and reduce symptoms of attention deficit hyperactivity disorder.

- Child outcomes can be positively influenced by access to community resources such as: learning, recreational, social, child care, medical facilities and employment opportunities for parents.

- In Canada, school readiness is assessed and evaluated through a national survey of children's well-being (*National Longitudinal Survey of Children and Youth* (NLSCY); reporting requirements of provinces and territories related to federal transfer payments; and research institute initiatives.

- The United States has legislated the requirement to track and promote school readiness and thus has developed a comprehensive and coordinated system.

- Many countries around the world are collecting longitudinal, national data on their children's well-being.

- School readiness interventions from a health perspective should include consideration of the child's: medical/physical health (lead poisoning, asthma, nutrition, safety from injuries, safety from abuse/neglect); vision; oral health; social-emotional development; and mental health.

- Interventions to address the above should include access to: medical screening and early interventions, a health practitioner, nutritional needs, an integrated approach serving both children and their families; parent education and support and health education for early care and education professionals.

- Nineteen proven interventions were identified that had a health component, addressed prenatal education for children from 0-5 years, identified positive child outcomes and focused on school readiness or healthy/safe children.

- Proven interventions were subdivided into the following categories: developmental assessment and access to early interventions; family support services; early childhood care, education and family support; and early childhood social-emotional interventions.

- All of the interventions in the "proven" category have shown significant differences in the following children's outcomes: cognitive/achievement, behavioural/emotional, educational, child maltreatment, and/or health.

- The following proven interventions have been identified:

Developmental Assessment and Access to Early Interventions

- Developmentally Supportive Care: Newborn Individualized Developmental Care and Assessment Program (NIDCAP)

- The Infant Health and Development Program (IHDP)

- The Healthy Steps Approach

- Reach Out and Read

- Trauma-Focused Cognitive Behavioral Therapy (TF-CBT)

Family Support Services

- Nurse Family Partnership (NFP)

- Healthy Families New York (HFNY)

- DARE to be You

- Triple P--Positive Parenting Program

- Families and Schools Together (FAST)

- Incredible Years

Early Childhood Care, Education and Family Support

- Carolina Abecedarian Project

- Child-Parent Centers

- Perry Preschool Project

- Early Head Start

Early Childhood Social-Emotional Interventions

- Primary Project

- Promoting Alternative THinking Strategies (PATHS)

- Al's Pals: Kids Making Healthy Choices

- Fast Track

- Five promising practices are described and include: comprehensive service programs (health, education, family support); supporting transitions to kindergarten; and promoting child friendly cities and communities.

- The promising practices address neighbourhood and community supports and include:

  o Toronto First Duty

  o Sure Start

  o Smart Start

  o Supporting Transitions from Preschool to Kindergarten

  o Promoting Child Friendly Cities and Communities

- All of the identified interventions and promising practices address health practice, programs, or policy.

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Introduction

In 2009, early child development was a major area of focus for the National Collaborating Centre for Determinants of Health (NCCDH). The first part of this environmental scan was conducted to clarify the definition of school readiness, explore how it is being evaluated and identify best practices for public health practitioners and communities/populations in the promotion of school readiness. Consideration was given for the following public health practitioner roles: public health nurses, nutritionists, medical officers of health, epidemiologists, health promoters, dental hygienists, community developers and environmental public health practitioners. Scientific and organizational sources, nationally and internationally, were reviewed to present the definitions, determinants, indicators and interventions associated with school readiness.

Methodology

This document presents the results of the first stage of an environmental scan of school readiness and health. The objectives of both stages were:

> 1) Using scientific and organizational sources, nationally and internationally, identify the interventions and indicators associated with school readiness and health; and,

> 2) Determine the feasibility of implementing the identified interventions by public health practitioners in Canada through surveys, forums, and/or key informant interviews.

In order to determine what programs and policies were successful for promoting school readiness within a health policy context, it was necessary to identify the necessary domains for inclusion in the scan. To that end, a broad scientific literature review was conducted to ascertain the current definitions and determinants of school readiness.

Scientific Review

The following databases were used for the review of the scientific research: Academic Search Complete, CINAHL, Education Research Complete, ERIC, Family & Society Studies Worldwide, MEDLINE with Full Text, PsycARTICLES, PsycINFO, Social Work Abstracts and Teacher Reference Center (see box below for a description of the databases).

Academic Search Complete is the world's most valuable and comprehensive scholarly, multi-disciplinary full-text database, with more than 8,500 full-text periodicals, including more than 7,300 peer-reviewed journals. In addition to full text, this database offers indexing and abstracts for more than 12,500 journals and a total of more than 13,200 publications including monographs, reports, conference proceedings, etc. The database features PDF content going back as far as 1887, with the majority of full text titles in native (searchable) PDF format. Searchable cited references are provided for more than 1,400 journals.

CINAHL® with Full Text is the world's most comprehensive source of full text for nursing & allied health journals, providing full text for more than 610 journals indexed in *CINAHL®.* This authoritative file contains full text for many of the most used journals in the *CINAHL* index - with no embargo. Full-text coverage dates back to 1981.

Education Research Complete is the definitive online resource for education research. Topics covered include all levels of education from early childhood to higher education, and all educational specialties, such as multilingual education, health education, and testing. *Education Research Complete* provides indexing and abstracts for more than 2,100 journals, as well as full text for more than 1,200 journals, and includes full text for nearly 500 books and monographs.

ERIC, the Education Resource Information Center, contains more than 1.3 million records and links to more than 323,000 full-text documents dating back to 1966.

Family & Society Studies Worldwide™ is a core resource providing the most comprehensive coverage of research, policy, and practice literature in the fields of Family Science, Human Ecology, Human Development, and Social Welfare. FSSW is an anthology of 4 database files providing access to more than 1.3 million records. Coverage spans from 1970 to the present.

MEDLINE with Full Text is the world's most comprehensive source of full text for medical journals, providing full text for more than 1,470 journals indexed in *MEDLINE.* Of those, more than 1,450 have cover-to-cover indexing in *MEDLINE,* and of those, 551 are not found with full text in any version of *Academic Search,* Health Source or *Biomedical Reference Collection.*

PsycARTICLES®, from the American Psychological Association (APA), is a definitive source of full text, peer-reviewed scholarly and scientific articles in psychology. It contains more than 153,000 articles from nearly 80 journals published by the American Psychological Association (APA), its imprint the Educational Publishing Foundation (EPF), and from allied organizations including the Canadian Psychological Association and the Hogrefe Publishing Group. It includes all journal articles, book reviews, letters to the editor, and errata from each journal. Coverage spans 1894 to the present and nearly all APA journals go back to Volume 1, Issue 1.

The *PsycINFO ,* database, American Psychological Association's (APA) renowned resource for abstracts of scholarly journal articles, book chapters, books, and dissertations, is the largest resource devoted to peer-reviewed literature in behavioral science and mental health. It contains over 3 million records and summaries dating as far back as the 1600s with one of the highest DOI matching rates in the publishing industry. Journal coverage, which spans from the 1800s to the present, includes international material selected from around 2,500 periodicals in dozens of languages.

Social Work Abstracts offers extensive coverage of more than 450 social work and human services journals dating back to 1965. Produced by the National Association of Social Workers (NASW), the database provides citations and abstracts dealing with all aspects of the social work field, including theory and practice, areas of service and social issues and problems.

Teacher Reference Center provides indexing and abstracts for 280 of the most popular teacher and administrator journals and magazines to assist professional educators.

Criteria for the search included scholarly peer-review articles from 1985 to the present, written in English, using the keyword _school readiness_. A total of 2170 articles were found from the following databases: PsycINFO (N= 862), Education Research Complete (N=668), Academic Search Complete (N=483), ERIC (N=460), Family & Society Studies Worldwide (N=232), Teacher Reference Center (N=80), and CINAHL with Full Text (N=70).

All abstracts were scanned for relevancy to children, school readiness, and health. The World Health Organization's definition of health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" [1] was used. Papers were excluded if they did not focus on children (0-6 years), did not address outcomes associated with school readiness and health or were not scientifically rigorous. Article types were predominantly limited to randomized control trials, meta-analyses, controlled clinical trials, systematic reviews, literature reviews and government publications.

The resulting research review supported the use of an ecological model for school readiness. The child's health and "readiness to learn", along with their family environment and practices, neighbourhood influences such as the physical and social environment, community resources and distribution and societal factors, all influence how well a child will do as they enter school. The following table details the number of scientific articles used by domain area:

TABLE 1. RESULTS OF THE SCIENTIFIC REVIEW OF SCHOOL READINESS AND HEALTH

Domain related to School Readiness and Health	Number of articles
Theory/Definition/Determinants of school readiness	23
Child Characteristics	21
Family Influences	8
Neighborhood Influences	31
Community Influences	6
Societal Influences (e.g., public health initiatives)	7

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The results from the scientific research review were used to develop a *Conceptual Framework of School Readiness and Health* (see below) in order to:

- Systematically search for and retrieve evidence;

- Assess the quality of and summarize the body of evidence of effectiveness;

- Identify and summarize research gaps;

- Identify school readiness indicators used nationally and internationally; and,

- Organize, group, and select appropriate interventions and to choose the outcomes used to define success for each intervention.

Conceptual Framework for School Readiness and Health
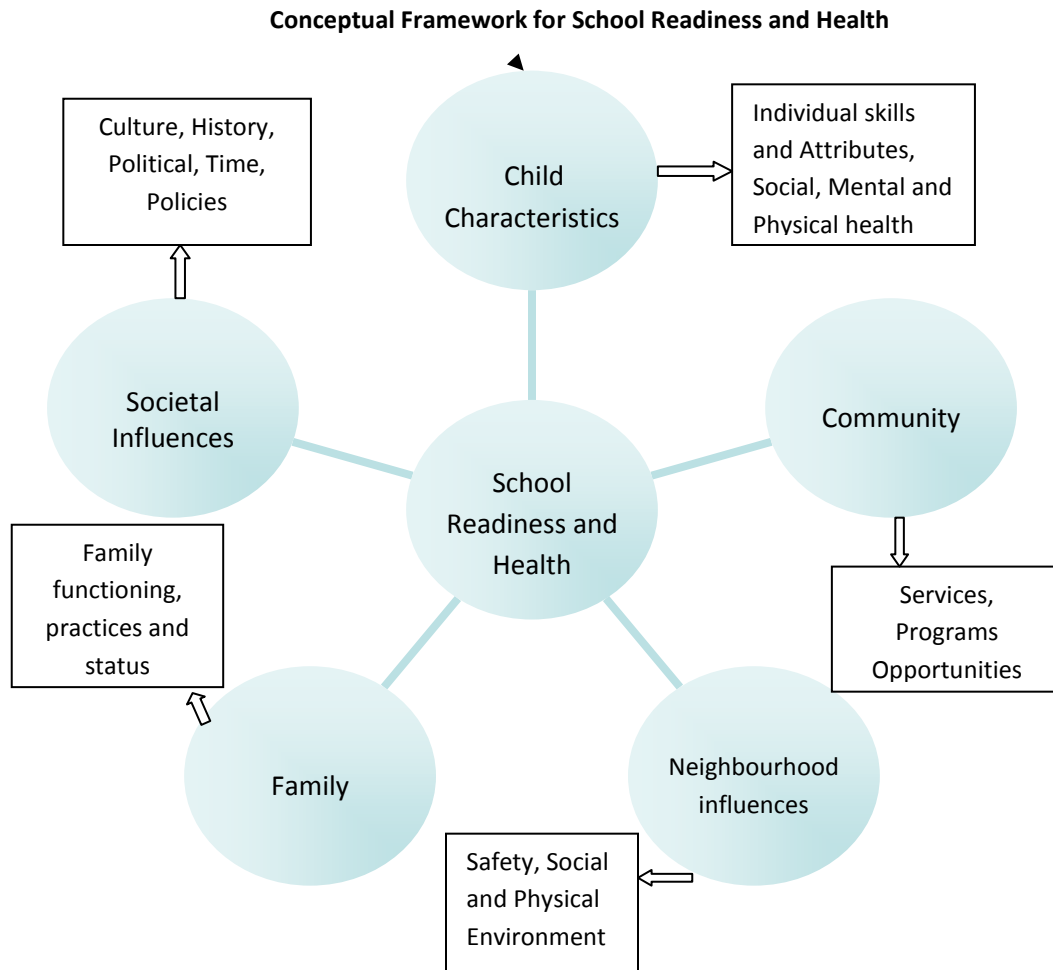
Thus, this first part of the environmental scan focused on interventions or practices which:

- Have a health component (program or practice) or is applicable to health policy

- Are based on children 0-6 years or pre-natal maternal education

- Include child, family, neighborhood or community components

- Have identified positive child outcomes

- Are evidence-based using randomized control trials and/or well conducted quasi-experimental research for the "proven" category

Internet Data Sources

Along with a scan of the scientific literature, a search of the grey literature and organizational sources was conducted. The Internet review used the following key search terms: school readiness AND health AND determinants OR indicators OR early health interventions OR early childhood education/care OR school transitions OR environmental health OR health promotion/prevention.

Appendix 1 lists the forty-two internet sites that were chosen which address health based interventions and practices for promoting school readiness. The list is broken down into the following categories: clearinghouses and databases, associations and institutions promoting school readiness, early intervention and education, indicators and school readiness initiatives, and environmental influences on school readiness.

The following describes the results of both the scientific and Internet scan of school readiness from a health perspective. **This environmental scan adds to the school readiness knowledge base by identifying those interventions which include a health component, expands the definition of school readiness to include child health, safety, social-emotional development and mental health, and presents new trends and programs being considered for enhancing school readiness from an ecological framework.**

RESULTS

Definition of School Readiness

Broadly speaking, school readiness is a marker for early child development in developed countries. Understanding the interconnectedness between health, well-being, learning and behavior in children provides a launch for exploring school readiness. As Michael and Elliot succinctly describe,

> Health and learning are intertwined; in order to grow and learn very young children need a healthy beginning. The early years are a time of rapid growth and development and can be a time for establishing a healthy base for learning. Nutrition, physical activity, mental ability, and amount of stress, all interact to affect learning. Understanding the intertwined health, social development and learning requirements of young children can guide parents, practitioners, and policy-makers in planning for early childhood. Nurturing relationships, good nutrition, exercise, and rich environments enhances early brain growth and development. Learning language depends on conversations and interactions with a variety of people. Children are nested within families and families within communities. Information concerning young children's health, well-being and their active growth and learning benefits families and communities (p. 4).[2]

Viewing child development within an ecological framework is the predominant thinking of researchers, educators, health professionals and policy makers today. As such, how well a child develops and learns is influenced by individual, familial, neighbourhood, community and societal factors.[3] Thus, promoting school readiness requires a comprehensive, collaborative, and transdisciplinary approach, with health professionals playing a key role.

This shared responsibility brings with it different perspectives, often determined by ones' role (policy maker, researcher, educator, health professional, parent). However, until recently, most definitions of school readiness focused on the child's "readiness to learn". For example, according to the _Understanding the Early Years Initiative_, a pan-Canadian **government** initiative, school readiness is defined as "a child's ability to meet the various demands of learning in a classroom and school environment, to benefit from the educational activities at school, as well as the ability to interact with and get along with others, including teachers and other children. School readiness refers to a child's readiness for grade one (and thus, is measured in kindergarten)".[4]

Leaders in the field of school readiness and **education**, the _American National Education Goals Panel_,[5] added more child-focused criteria based on emerging research on child development and well-being. In 1997, school readiness was defined as encompassing:

Physical well-being and appropriate motor development

- Includes **adequate levels of energy** to enable the child to concentrate
  on school activities and the ability to resist common infections.

- Includes sufficient **physical coordination** to complete common kindergarten and grade one tasks

Emotional health and a positive approach to new experiences
- Includes **emotional maturity** to: a) defer immediate gratification, for example, to resist talking with another child instead of doing an assigned task; b) persist in repetitive but necessary exercises, such as sounding out words; and c) cope with momentary failures without an outburst of weeping or intense anger that prevents continued concentration and learning from mistakes.

Age-appropriate social knowledge and competence
- Includes an awareness of the general standards of acceptable behaviour in a public place, the ability to control one's own behaviour, the ability to cooperate with others in working together on assignments, appropriate respect for adult authority, and the skills to communicate feelings and wants in socially acceptable ways. Includes the social skills necessary for **positive peer interactions.**

Age-appropriate language skills
- Includes the ability to **understand adults' and other children's verbal communication**; and to be able to verbally communicate experiences, ideas, wishes, and feelings in a way that can be understood by others.

Age-appropriate general knowledge and cognitive skills
- Includes the ability to **understand similarities and differences** between groups of objects and the ability to **remember and recite back** specific pieces of information.

Using the same categories but from a more **child developmental perspective**, Doherty identified the following criteria for school readiness based on her review of the research. This included:

Physical well-being and appropriate motor development
Assuming normal birth weight and the absence of any major disability or sensory impairment, children's physical well-being and motor development unfolds as it should as long as the child:

- has adequate **nutrition**;

- is **protected** against accidents or the experience of neglect, abuse, or violence;

- is protected against preventable diseases through **immunization;** and

- has ample opportunity to **exercise** large muscles through running, jumping and climbing, and to develop fine motor coordination through manipulation of various objects.

Emotional health and a positive approach to new experiences
Child has developed a **secure attachment** with a caregiver which allows them the skills in regulating their emotions and to develop competence and self-confidence through environmental exploration.

Social knowledge and competence
Through 'secure attachment' with a caregiver and via direct instruction, the child has learned to be cooperative, empathetic and responsive with their peers. Positive interactions with peers results in greater **social competence** with other children.

Language skills

Language development requires: a) gaining **control over the speech apparatus** in order to produce specific sounds intentionally; b) being **exposed to language**; and c) being **actively encouraged to use language**.

> "Children who are being readied for future learning (and, therefore, for school) are spoken and listened to; have their questions answered; are offered explanations; and are encouraged to try new words and ideas, to imagine, to guess, to estimate, to draw, and to observe…." Ontario Royal Commission on Learning (p.14) [6]

General knowledge and cognitive skills

The rate of development and the formation of the cognitive skills required for school readiness depends upon anatomical maturation of the **central nervous system** and the child's **physical and social experiences**.

These five skills and attributes (physical well-being and motor development; emotional health and a positive approach to new experiences; age-appropriate social knowledge and competence; age-appropriate language skills; and age-appropriate general knowledge and cognitive skills) have been used widely by **researchers** across Canada and internationally. For example, these domains are the basis for many school readiness research initiatives using the _Early Development Instrument_ (EDI) in Canada and abroad. [7-10]

Teachers, on the other hand, have focused on different child skills and attributes. According to a national survey of 1448 kindergarten teachers, school readiness means that children are physically healthy, rested and well nourished; able to communicate needs, wants and thoughts; and are enthusiastic and curious in approaching new activities. [8] Teachers have also identified the importance of socialization, friendship, communication, dealing with conflict and general life skills as critical factors in learning and living with others. [9]

Parents' definition of school readiness has also shown to identify different issues. McAllister, Wilson, Green and Baldwin [10] explored the definition of school readiness with families participating in the Early Head Start Program. The parents identified the importance of social and emotional health in relation to their child's and their own readiness for their child to begin school. Specifically, these parents were concerned with: 1) strengthening their children's social capacities and ensuring their emotional health in preparation for school entry; 2) the challenging and potentially threatening school environment; and 3) the transition that parents themselves undergo in preparation for their children's school entry.

These different definitions of school readiness all focus on the child and address conditions of skill, development and maturity considered important for school success. Recently, and likely due to the greater understanding of distal and proximal influences of family, community and society on children's development, the definition of school readiness has broadened. Americans have taken a lead role in legislating and supporting national efforts at promoting school readiness for its children. For example, the _School Readiness Indicators Initiative_ is a 17 state

program that tracks and evaluates school readiness [11] where school readiness includes child, family and community components. Called the *Ready Child Equation*, important conditions for school readiness include:

A. **Children's** readiness for school.

B. **School's** readiness for children.

C. The capacity of families and communities to provide developmental opportunities for their young children.

i) **Ready Families**: Describes children's family context and home environment.

ii) **Ready Communities**: Describes the community resources and supports available to families with young children.

iii) **Ready Services**: Describes the availability, quality and affordability of proven programs that influence child development and school readiness.

iv) **Ready Schools**: Describes critical elements of schools that influence child development and school success.

From a **health perspective,** Emel and Alkon [12] present an ecological model of school readiness based on their review of large studies evaluating health and child development. As seen below, the important domains of school readiness include: the child's physical health, socioemotional and intellectual development; family well-being (socioeconomic status, demographics, family functioning, and parental health); family supports; paediatric health care receipt; and child care and education.

Model of Early Child Development
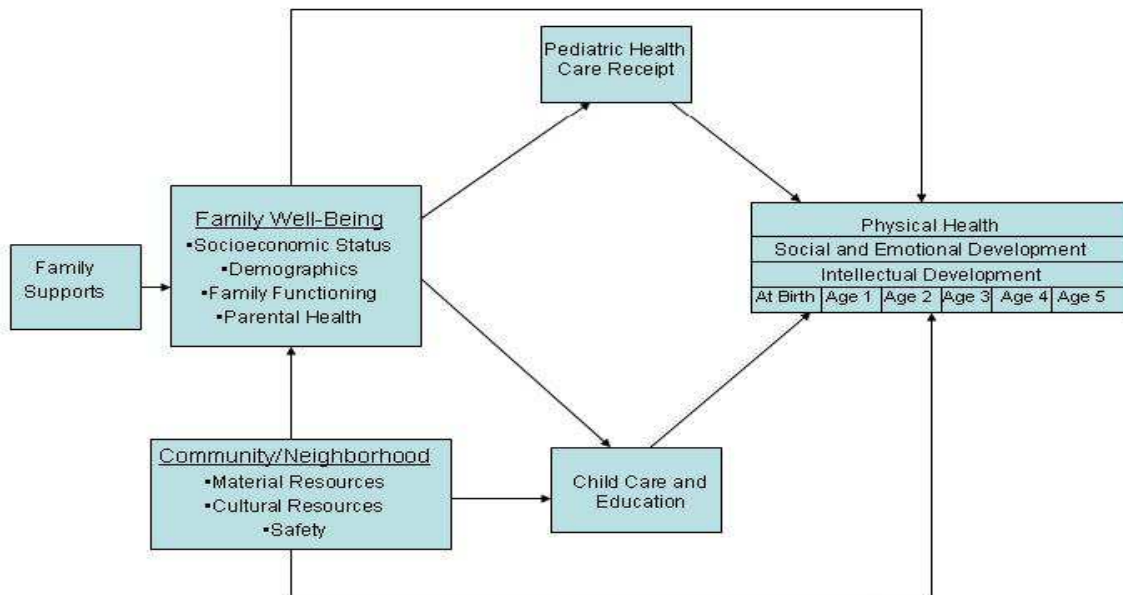
Source: Child Trends, Inc.

As shown, over time and as new research has emerged, there has been an expansion of the definition of school readiness. The initial focus was on the child's cognitive abilities. This was extended to include a broader description of child developmental areas (health and physical development, social and emotional development, approaches to learning, language development, cognitive development and general knowledge). More recently, the inclusion of family, neighbourhood, community and societal influences have been added to the definition of school readiness. Finally, recent thinking suggests that school readiness is influenced by culture and time. [13]

For the purposes of this report, school readiness encompasses the following conceptual considerations: (1) readiness resides within the child and unfolds in stages until the child reaches maturation; (2) readiness can be supported or accomplished through environmental interventions; (3) readiness must take into account both child characteristics and experiences in the child's environment; (4) readiness represents a set of ideas or meanings constructed by communities and schools; and (5) readiness is multi-dimensional, highly variable, and culturally and contextually influenced over time.

Source: Wesley, P. & Buysse, V. (2003). Making meaning of school readiness in schools and communities. *Early Childhood Research Quarterly, 18* 351–375. [14]

Although there are differences across the multiple perspectives in relation to school readiness, commonalities also exist. These include health, social, intellectual, and developmental aspects of the child; family functioning, practices and status; neighbourhood influences; community services, programs and opportunities; and societal influences such as public policy. These commonalities of school readiness definitions are predicated by and tied to the research on the determinants of child development.

Determinants of School Readiness

Individual Child Characteristics

Although each child is unique, typical developmental patterns also occur. Recent child development research has coined early developmental growth as "windows of opportunity". [15,16] Individual child determinants of school readiness include physical and social-emotional opportunities for growth as well as the physical and mental health of the child.

Key **physical** "windows of opportunity" relate to how the child sees, moves and interacts within its world. Nash [17] has identified the sensitive period for visual acuity to be at its strongest between birth and age five or six and gradually waning toward age eight. The sensitive period for gross motor control (walking, climbing and jumping), is at its maximum from birth to age five then gradually wanes around age eight. Fine motor control development is

believed to start around age two and begin to wane at about age ten [18] and has been shown to be a predictor of later mathematics achievement. [19] Between nine months and five years of age has been identified as the sensitive period for acquiring language and language skills, [20, 21] which has been found to be a significant predictor of school readiness. [22]

The child also has "windows of opportunities" related to **social and emotional development**. The sensitive period for learning emotional control is between birth and age two [23] and is likely related to the ability to regulate stress responses. [24] Research has also indicated that the extent of children's eagerness and willingness to explore new experiences and their general trusting or wary approach to life, is established as early as age two. [25] The general consensus on the antecedents of these social/emotional abilities is *Attachment Theory*. [26]

Essentially, the child instinctually seeks out a secure relationship with an adult caregiver(s), particularly during stressful situations. The response style of the caregiver influences how the child will develop both social and emotionally. Sensitive and responsive caregivers provide the child the sense of security he/she seeks and later serves as the touchstone for exploration of their world. [27] If secure attachment doesn't occur (typically between six months to two years), other patterns are likely to result, such as avoidant, anxious or disorganized attachment. It is believed that these patterns of attachment develop into an internal working model that influences the child's feelings, thoughts and expectations in later relationships.[28]

Relatedly, an important skill for school readiness is peer social competence, where the child begins to actively engage in play with other children. This play activity usually starts around age three until age six or seven. [29, 30] Recent Canadian research has found that children's social and emotional development serves as both an indicator of school success and a predictor of later school success. [31]

Early childhood **mental health** refers to the social, emotional, and behavioural needs of children from birth to age six. [32] The promotion of good mental health during the first six years of life can help facilitate the establishment of developmental competencies that will positively contribute to children's school readiness as well as positive lifelong development. [33, 34, 35 36] According to the *National Research Council and Institute of Medicine*, [37] untreated mental health problems in childhood are likely to continue into adolescence and young adulthood, worsen over time and create significant and costly burdens for families, schools, and society.

Child health factors also influence development and school readiness. Halle, Zaff, Calkins and Geyelin Margie, [38] in their review of contributing factors to school readiness, identified the following as important influences: low birth weight, immunizations, poor nutrition, unintentional injury, lead exposure, dental decay and emotional and behavioural problems. Data from the *Early Childhood Longitudinal Study-Birth Cohort study* has found that poor infant health explains a significant portion of ethnic disparities in math and reading skills at age four. [39]

According to Canadian statistics for 2002/03, collected by the Federal Government in their report _The Well-Being of Canada's Young Children_, [40] the statistics in Table 2 apply to these categories and as shown, represent a significant number of children.

TABLE 2. HEALTH INDICATORS AND STATISTICS OF CANADA'S YOUNG CHILDREN (BIRTH – 5 YEARS)

Indicator	2002/03 unless otherwise indicated
Percentage of Young Children **NOT** Born at a Healthy Birth Weight	19% (2002)
Pre-term Birthrate — Percentage of Children Born at 37 Weeks of Gestation or **EARLIER**	7.5 % (2002)
Number of Cases of Haemophilus Influenzae-b Among Young Children	9 (2003)
Number of Cases of Meningococcal Group C Disease Among Young Children	5 (2003)
Number of Cases of Measles Among Young Children	6 (2003)
Infant Mortality Rate — Number of Deaths per 1,000 Live Births	5.4 (2002)
Injury Mortality Rate — Proportion of all Deaths Among Young Children as a Result of Injury (per 1000)	Data not yet available
Percentage of Young Children Displaying LESS than Average to Advanced Levels of Motor and Social Development (MSD)	13.6%
Percentage of Young Children Displaying Behaviors Associated with Emotional Problem Anxiety	16.7%
Percentage of Young Children Displaying Behaviours Associated with Hyperactivity-Inattention	5.5%
Percentage of Young Children Displaying Behaviors Associated with Aggression-Conduct Problem	14.6%
Percentage of Children **NOT** Displaying Age Appropriate Personal-Social Behavior	15.7%

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Adapted from _Monitoring the Well-being of Canada's Young Children 2006-_ See
http://www.socialunion.gc.ca/well_being/2007/en/well_being.pdf

Along with physical health issues, cognitive differences found in young children have been associated with school readiness. Recent research has explored the relationship between executive functioning in young children and academic and social competence. Executive functioning typically relates to prefrontal cortex activity associated with planning and problem solving as well as monitoring behavior (e.g., using working memory, attention and inhibitory control).

Even though individual differences are normal in children's executive functioning, research is now finding that certain interventions can improve these cognitive skills and abilities. Fuhs and Day [41] found preliminary evidence of improved executive functioning in children who attended a Head Start preschool and they propose that it is related to increased expressive and receptive verbal ability. In another Head Start study, Welsh, Nix, Blair, Bierman, and Nelson [42] explored the relationship between working memory and attention control for literacy and numeracy for at risk preschoolers. This longitudinal study found that working memory and attention control predicted growth in emergent literacy and numeracy skills during the prekindergarten year and that growth in these cognitive skills made unique contributions to the prediction of kindergarten math and reading achievement.

Thus, individual child factors promoting or hindering development are influenced by both genetics and experiences within the world. Current research suggests that although "windows of opportunity" are usually prime times for further development, they are not the only times that children can learn and develop. [43] However, caring, secure, stimulating environments in early childhood have the power to influence neurological development of the brain, with important and lasting implications for children's capacity to learn. [44, 45]

Family Influences on School Readiness

For young children, familial environments have the greatest influence on development and school readiness. [46, 47] In a seminal Canadian study looking at family characteristics and neighbourhood effects for school readiness, Kohen, Hertzman and Brooks-Gunn [48] evaluated data from the *National Longitudinal Survey of Children and Youth* (NLSCY; a cross sectional sample of 22,831 children aged 0-11 years). They focused on school readiness in toddlers (aged 2-3 years) and preschoolers (aged 4-5 years). For the younger children, the authors examined reports of motor and social development as well as reports of behaviour problems from the person most knowledgeable about the child (PMK-usually the mother). For the preschoolers, receptive verbal abilities--a proxy measure for cognitive competence-- was assessed by interviewers and mothers' reports of behaviour problems. These outcome measures were examined in relation to various neighbourhood and family characteristics. For both toddlers and preschoolers, family characteristics were identified as the primary influence in promoting children's school readiness. Especially relevant was maternal education and family income in predicting children's competencies.

Access to learning resources, expectations and practices can also make a difference for children's school readiness. Children living in poverty typically have fewer children's books,[49, 50] are less likely to have a computer [51] and tend to watch more television. [52, 53] Further, parents living in poverty are less likely to read to their children on a daily basis, visit the library,[54, 55] volunteer, attend school functions or monitor homework compared with the parents of children from middle and upper-income communities.[56] Along with these background characteristics, other family attributes that are reported to influence school readiness are "parents' emotional well-being, positive inter-parental relations, and consistent parental support, sensitivity, and discipline practices" (p. 889). [57] Researchers from the UK Millennium Cohort Study [58] found that although poverty has a significant effect on children's health and school readiness, home learning, family routines and psychosocial environmental factors can mitigate income gaps.

The *National Center for Family and Community Connections with Schools* provides a useful description of the positive roles that parents can play in promoting their child's school readiness. [59]

> **Families as nurturers and supporters**—the family's most basic role is to provide for their children's health, safety, security, and emotional well-being.

> **Families as teachers**—families can do many things to support children's learning and their motivation to learn. Family teaching roles include:

>> • establishing an at-home learning environment for the whole family,

>> • expressing high expectations and encouraging learning,

>> • providing opportunities for learning and development within the community,

>> • providing books and other learning materials,

>> • reading and telling stories, and,

>> • practicing and transmitting cultural traditions.

> **Families as intermediaries**—family members help negotiate and oversee their children's ties to neighbours, friends, and the broader community, helping children learn and observe social protocols and function safely and productively within their spheres of existence.

> **Families as advocates**—in helping their children move beyond the home, families select from the range of choices available, depending on the family's resource and location, the environments they believe will be most supportive. They seek out and advocate for services and opportunities, and intervene on their children's behalf when problems arise.

Neighbourhood Influences on School Readiness

> Striking disparities in what children know and can do are evident well before they enter kindergarten. These differences are strongly associated with social and economic circumstances and they are predictive of subsequent academic performance" (p. 5). [60]

Different theories have been promoted for explaining neighbourhood effects on children's health and well-being. For example, Jencks and Mayer [61] suggest that the availability of and competition for neighbourhood resources, peer, familial and outside adults may influence child and youth outcomes. Connor and Brinks [62] also suggest social contagion, collective socialization, resources and add competition influences, while Shonkoff and Phillips [63] add environmental conditions such as toxins and safety (stress model).

Poverty. A large body of evidence from the population health research has identified poverty as one of the greatest predictors of child well-being and school readiness. [64, 65, 66, 67] Children living in poor neighbourhoods have a multitude of disadvantages facing them and their families. These include poorer physical health, increased social stressors, greater incidences of emotional, behavioural and cognitive problems and more difficulties in school. [68, 69, 70, 71, 72] Specific to school readiness, Oliver, Dunn, & Hertzman [73] found that although family characteristics were important in their study of 468 neighbourhoods in Vancouver, BC., neighbourhood-level factors were independently associated with physical health and well-being, language and cognitive development, and communications skills and general knowledge in kindergarteners. The strongest neighbourhood characteristics associated with readiness to learn was median family income and the percentage of single-parent families. As well, whether or not a family had moved in the past 5 years and the percentage of the population whose first language was non-English influenced school readiness scores on the *Early Development Instrument*-- a population level measurement of school readiness.

Similar results were found in a population based study of school readiness in Saskatoon, Saskatchewan. [74] Neighborhoods that had a higher rate of mobility, lower employment levels and higher rates of English as a Second Language (ESL) students reported lower school readiness scores. Interestingly, ESL children from neighbourhoods with a high degree of ethnic diversity had higher school readiness scores than those ESL students in neighbourhoods with low ethnic diversity.

Social relationships. A Canadian national initiative, *Understanding the Early Years*, has also provided valuable insights into the neighbourhood factors influencing early child development. [75] Wilms [76] in his evaluation of four Canadian communities concluded that along with family income, parental education, employment, approaches to parenting and engagement in learning activities, determinants of early childhood outcomes also include the family's use of available resources, neighbourhood social capital and social support. Social capital or the social relationships among community members have been the focus of recent neighbourhood impact research on children's well-being. Connor and Brink [77] define social capital as "shared norms, reciprocal obligations and opportunities for sharing information and relationships within the community" (p. 8). Runyan et al. [78] found that the perception of personal support, neighbourhood support and social affiliation (defined as church attendance) was positively associated with developmental and behavioural well-being in preschoolers, and particularly salient

for "families who have fewer financial and educational resources" (p.46). Sampson, Morenoff and Gannon-Rowley have concluded that neighbour supportiveness can influence children's development through social connections, role models, trust, and help. [79]

Relatedly, the term, collective efficacy is being studied in relation to child outcomes. Collective efficacy relates to the willingness of adults to intervene in the lives of neighbourhood children, helping each other, having shared values and being close-knit. A Neighborhood Support Index is now being used by Americans in their _National Survey of Children's Health_, to explore the influence of social cohesion, social control and safety on school readiness. [80] It consists of six questions posed to parents: 1) my child is safe in our neighborhood; 2) people in the neighborhood watch out for each other's children; 3) people in the neighborhood help each other out; 4) there are people I can count on in this neighborhood; 5) there are adults nearby who I trust to help my child if he/she got hurt playing outside; and 6) there are people in the neighborhood who might be a bad influence on my children. In the associated study, Wilkenfeld, Lippman, and Anderson Moore found that in the United States, 13 percent of children reside in neighborhoods perceived as most supportive, 62 percent of children live in neighborhoods with moderately high support from neighbors, 20 percent of children live in neighborhoods with moderately low support, and 6 percent live in least supportive neighborhoods.

**Physical environment.** A relevant direction of research applicable to public health is the association between the physical environment and children's well-being. At the most basic level, environmental toxins such as lead, mercury, and PCBs have been shown to negatively affect children's growth and development. For example, lead poisoning has been shown to result in such social-emotional consequences as hyperactivity, impulsivity, elevated aggression and distractibility [81, 82] and reduced IQ. [83] Maternal mercury exposure has been associated with lower language development and IQ [84] as well as worsened hand-eye coordination, motor speed, visual attention and memory. [85] Adverse cognitive deficits have also been associated with maternal ingestion of PCBs associated with contaminated fish, resulting in poor attention regulation, lower IQ, and reading deficits. [86] Within one's neighbourhood, the negative effect of noise pollution and crowding on child development has been studied extensively. Evans and colleagues have found that children exposed to airport noise have difficulty reading compared to their peers located in quiet neighbourhoods—a finding associated with impaired long term memory. [87] As well, chronic noise exposure has shown to have a negative influence on visual search performance and speech perception, [88, 89] and is believed to increase hyperactivity. [90] Along with noise pollution, crowding has been shown to negatively impact social-emotional behaviour in children. Children in crowded conditions exhibit more social withdrawal, [91] elevated aggression and diminished cooperation. [92] As well, crowding has shown to be associated with greater attentional deficits, [93] lower IQ scores, [94] and greater psychophysical stress. [95, 96]

The physical layout of the environment within neighbourhoods can also negatively influence children. Children living in high-rise buildings vs. low-rise have shown to exhibit more behavioural problems [97] and worse academic performance; [98] however, these results have not been replicated. [99] As well, there has been some evidence of increased psychological distress [100] and impaired cognitive functioning [101] in poor quality housing. Housing in close proximity to street traffic has also been correlated with restrictions in outdoor play, smaller social networks and reduced social and motor skills for 5-year-olds. [102] Unsafe environments have also been linked to reduced physical activity and play. [103, 104]

One positive aspect of the environment for children is the availability of natural settings within neighbourhoods. Seminal work by Kaplan and Kaplan [105] found that natural settings are restorative, reduce cognitive fatigue and enhance positive affect. In natural settings, children engage in more creative play[106, 107] and develop better motor skills. [108] Natural settings have also been shown to enhance attention [109] and reduce symptoms of attention deficit disorder. [110] The research clearly indicates that consideration of the effects of the physical environment is an important component for investigating child health and development. According to Evans, [111]

> Among the potentially developmentally salient physical characteristics of neighbourhoods are residential instability, housing quality, noise, crowding, toxic exposure, quality of municipal services, retail services (e.g., bars, liquor stores, and nutritional foods), recreational opportunities, including natural settings, street traffic, accessibility of transportation, and the physical qualities of both educational and health care facilities (p. 435).

Community Influences on School Readiness

Community factors which have been shown to influence school readiness are the availability and usage of community services and resources, a comprehensive system of developmental assessment and access to early interventions, quality early childhood care and education and school transitional practices.

Availability and Usage of Community Services and Resources. The Neighbourhood Resource Theory [112] (also called the Institutional Model by Jencks and Mayer [113]) purports that the quality and availability of programs, resources and services within a community may influence developmental opportunities and child experiences. According to their review of neighbourhood effects on children and youth outcomes, Leventhal and Brooks-Gunn [114] concluded that " … several types of resources in the community: learning; recreational and social activities; child care; schools; medical facilities; and employment opportunities, could influence child and adolescent outcomes" (p. 322). Determining the usage of these resources is equally important as their availability, where accessibility may be limited by income[115], age of the child/youth[116], cultural/ethnic considerations [117] or physical access[118]. It is also important to determine whether parents access resources outside their neighbourhoods as Jarrett has found. [119]

Thus, as the research shows, the ecological model of child development applies to school readiness. The child's health and "readiness to learn", along with their family environment and practices, neighbourhood influences such

as the physical and social environment, and community resources and distribution, all influence how well a child will do as they enter school. These determinants of school readiness are reflected in the indicators used to assess and evaluate school readiness.

School Readiness Indicators

Examining school readiness indicators in Canada and abroad provides a picture of how nations are addressing the health and well-being of their young children and speaks to the macro system of Bronfenbrenners' *Ecological Systems Theory* [120] (e.g., the cultural/societal influences).

Canada

This scan for school readiness indicators in Canada shows tracking and assessment occurring through a national survey of children's well-being, reporting requirements of provinces and territories related to federal transfer payments and research institute initiatives. The federal government does not track school readiness per se but does measure children's well-being, using the *National Longitudinal Survey of Children and Youth* (NLSCY).

The National Longitudinal Survey of Children and Youth (NLSCY). The NLSCY is a longitudinal study that is following a sample of Canadian children until adulthood. Through a partnership between Human Resources Development Canada and Statistics Canada, the survey is conducted mostly with the person most knowledgeable (PMK- usually the mother) of the selected children. As the list of indicators in Table 3 shows, many of the determinants of school readiness reviewed earlier are being assessed.

TABLE 3. INDICATORS OF CHILD WELL-BEING FROM THE NATIONAL LONGITUDINAL SURVEY OF CHILDREN AND YOUTH (NLSCY)

The Motor and Social Development (MSD) scale consists of a set of 15 questions in the NLSCY that measure dimensions of the motor, social and cognitive development of young children from birth through 3 years of age; the questions vary by age of the child. These questions are asked of the PMK.

The Peabody Picture Vocabulary Test - Revised (PPVT-R) is designed to measure receptive or hearing vocabulary in either English or French. The test is administered by the interviewer directly to children 4 to 5 years of age. The PPVT-R is only administered to children who's PMK provided consent for the test to be administered to their child.

"Who Am I?" is designed to assess the ability to conceptualize and to reconstruct a geometrical shape (copying skill), and the ability to use symbolic representations (writing task) such as numbers, letters and words. Because "Who Am I?" assesses nonverbal language, it can be used to assess children whose knowledge of English or French is limited. These children could be allowed to complete tasks in their mother tongue as well as in English and French. The assessment consists of an appealing booklet in which the child completes the tasks as the assessor turns the pages and gives instructions.

Number Knowledge. Four developmental levels have been established for children's understanding of numbers — predimensional (level 0), unidimensional (level 1), bidimensional (level 2) and integrated bidimensional (level 3). Knowledge at each level of the test is a prerequisite, or provides the conceptual building block, for knowledge at the next level of the test. As the NLSCY captures responses from children 4–5 years of age, only the predimensional and unidimensional levels are considered for this developmental stage. The predimensional level assesses children's ability to count by rote and to quantify small sets, using concrete objects, and is important for the next level where children deal with changes in quantity without objects than can be touched or seen. The unidimensional level assesses children's knowledge of the number sequence and ability to handle simple arithmetic problems. To solve the items, children must rely on a "mental counting line" in their heads. The test is administered orally by the assessor, and the child must respond verbally. The child may not use paper and pencil to figure out answers.

Emotional Problem-Anxiety, Hyperactivity and Physical Aggression-Conduct Problem measures are key behaviour scales examined in the NLSCY. For each behaviour, a set of questions is used and the answers combined into a scale to give a more valid representation of the different types of behaviour. The questions associated with the behaviour scales are asked of the PMK and do not represent professionally diagnosed problem behaviours.

Emotional Problem-Anxiety. Respondents were asked about the frequency with which their child appears to be unhappy, depressed, worried, nervous or anxious. A child classified as having high anxiety was, in the parent's opinion, unhappy, fearful and tense.

Hyperactivity is characterized by restlessness, fidgeting, lack of concentration and inability to wait for his or her turn.

Physical Aggression-Conduct Problem. The PMK is asked a series of questions about the frequency with which his/her child engages in _physical aggression_ such as fighting, bullying or threatening people. These responses were combined to form a global scale for this type of behaviour, which ranged from 0 (those with the lowest reported

Ages and Stages — Personal-Social Score is one of a number of behaviour scales examined in the Ages and Stages questionnaire, a supplement to the NLSCY. The Ages and Stages questionnaire is designed to identify children who show potential development problems. The scale for personal/social behaviour comprises several questions capturing different age-relevant aspects of this behaviour, such as how the baby interacts with him/herself, with

strangers, with the parent and with objects such as toys. The questions associated with the behaviour scales are asked of the PMK and do not represent professionally diagnosed problem behaviours.

Parental Depression. The depression scale in the NLSCY represents a condensed version of the Depression Rating Scale (CES-D). This scale measures the occurrence and severity of symptoms associated with depression in the public at large and does not represent the occurrence of clinically diagnosed depression. The scale ranges in value from 0 to 36 with high scores indicating the presence of depressive symptoms. This scale is administered to the PMK.

Family Functioning. The family functioning scale provides a global assessment of family functioning (including problem-solving, communication, roles, affective involvement, affective responsiveness and behaviour control) and indicates the quality of relationships between family members. This scale is administered to either the PMK or spouse/partner of the PMK. The scale ranges in value from 0 to 36 with higher scores indicating family dysfunction. The scale does not reflect a clinical diagnosis. To identify the presence of family dysfunction, thresholds (or cut-off points) were established by taking the scale score that is closest to the 90th percentile based on NLSCY Cycle 3 data for children in all provinces. The variable represents the proportion of children whose family exhibits higher levels of family dysfunction and those whose family does not.

Positive Parenting. Positive interaction is a parenting style that is captured in the NLSCY. The purpose of the parenting scales is to measure certain parental behaviours. The scale ranges in value from 0 to 20, with high scores indicating positive interaction with the child. The questions assessing parenting styles were administered to the PMK or spouse/partner of the PMK.

Reading by an Adult. This indicator refers to the exposure of the child to reading activities with a parent or another adult. Therefore, this indicator should not be interpreted to refer specifically to parent-child interactions.

Neighbourhood cohesion scale. The purpose of the neighbourhood scales is to assess the extent of the presence/absence of certain neighbourhood characteristics. In particular, the neighbourhood cohesion scale can be used to measure the social unity of a neighbourhood (the extent to which the PMK feels that there is cohesion in the neighbourhood). Adult respondents are asked whether people in their neighbourhood are willing to help each other, deal with local problems, keep an eye open for possible trouble, and watch out for the safety of neighbourhood children, and whether they are people that their children can look up to. Responses to these questions were combined, resulting in a scale ranging from 0 (those reporting the lowest level of social cohesion) to 15 (those living in the most cohesive neighbourhoods). All questions about the neighbourhood were administered to the PMK or spouse/partner of the PMK. To identify low levels of neighbourhood cohesion, thresholds (or cutoff points) were established by taking the scale score that is closest to the 10th percentile based on Cycle 3 data for children in all provinces. The variable represents the proportion of children whose neighbourhoods exhibit lower levels of cohesion (as reported by the PMK) and those whose neighbourhoods do not.

The **neighbourhood safety scale** is used to measure the extent to which the PMK feels that there is a sense of safety in the neighbourhood. All questions about the neighbourhood were administered to the PMK or spouse/partner of the PMK. The scale ranges in value from 0 to 9 with higher scores indicating a greater sense of safety in the child's neighbourhood. The variable represents the proportion of children living in neighbourhoods with a lower sense of safety (as reported by the PMK) and those who do not.

Provincial/territorial reporting related to federal transfer funds. Two Canadian federal agreements are applicable to school readiness: *The Multilateral Framework on Early Learning* [121] and *The Child Care and Early Childhood Development Agreement.* [122] Human Resources and Social Development Canada introduced the *Multilateral Framework for Early Childhood Development* in 2003, which identified guiding principles for supporting young children. These included early learning and child care services that are: available and accessible, affordable, quality-based to promote development, supports parental choices and are inclusive. *The Child Care and Early Childhood Development Agreement* addresses conditions of risk for children in the earliest stages of life. The principles guiding this initiative include: prevention, promotion, protection and partnership and are focused on integrated community-based initiatives supporting healthy child development. Significant transfer payments are made to the provinces and territories to fulfill these agreements, which have reporting requirements that monitor progress of the well-being of our children. These governments have identified a common set of 11 indicators of well-being in four key areas of action: 1) promotion of healthy pregnancy, birth and infancy; 2) improvement in parenting and family supports; 3) strengthening of early childhood development, learning and care; and 4) strengthening of community supports. Table 4 lists the 11 early childhood well-being indicators that the provinces and territories track for *The Early Childhood Development Agreement.* The indicators presented pertain to the prenatal period through age 5. [123, 124]

TABLE 4. COMMON INDICATORS OF EARLY CHILDHOOD WELL-BEING RELATED TO THE EARLY CHILDHOOD
DEVELOPMENT AGREEMENT

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Physical Health and Motor Development	**Emotional Health**
Healthy Birth weight	Emotional Problem-Anxiety
Incidence of Meningococcal	Hyperactivity-Inattention
(Group C Disease)	Physical Aggression-Conduct Problem
Incidence of Measles	**Social Knowledge and Competence**
Incidence of Haemophilus	Personal-Social Behaviour
Influenzae–b (Hib)	**Cognitive Learning and Language**
Infant Mortality Rate	_Communication_
Motor and Social Development	Language

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Boyd [125] indicates that some jurisdictions report on additional indicators of child well being, including: family and community influences, preterm birth weight, child injury hospitalization, child injury mortality, prevalence and duration of breastfeeding, parental education, family income, parental depression, tobacco use during pregnancy, family functioning, positive parenting, reading by adult, neighbourhood social cohesion. Canada also reports on measures related to families with children living in core housing and alcohol use during pregnancy.

Canadian Research Initiatives. Early child development is also being evaluated across Canada through major research initiatives. A workshop of _the Early Childhood Learning Knowledge Centre's Monitoring Committee_ in 2008 describes these activities. [126] Essentially four different approaches are being used to monitor children's well-being. The first is the "social indicators" approach, conducted by the Canadian Council on Learning, which collects data from a variety of sources in order to provide a national and regional snapshot of trends and determinants. Called the _Composite Learning Index_, the data is derived from Statistics Canada and includes the indicators listed in Table 5. [127]

TABLE 5. COMPOSITE LEARNING INDEX INDICATORS, CANADIAN COUNCIL ON LEARNING

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Learning to Know	**Learning to Live Together**
Student skills (reading, mathematics, and problem solving)	Charitable giving
	Volunteerism
High-school dropout rates	Participation in social clubs and other organizations
Young adults' participation in post-secondary schooling	Access to community institutions, such as social clubs
Post-secondary attainment among working-age Canadians	**Learning to Be**
	Exposure to media
Learning to Do	Exposure to sports and recreation
Participation in job-related training	Exposure to cultural events and activities (e.g., museums)
Availability of work training	Festivals and the performing arts
Access to learning institutions	Access to resources, such as libraries

The second approach is a longitudinal survey, specifically the *Québec Longitudinal Study of Child Development*. It is a collection of developmentally appropriate information taken at regular intervals from a birth (or even pre-birth). The objectives of the study are to: 1) identify factors occurring during early childhood which influence social adaptation, school achievement; and 2) enhance knowledge of the role of certain social programs such as daycare, public health prevention initiatives and physical activity programs. This approach is used to study individual life course determinants of development, establish the timing and sequencing of key developmental events, and evaluate factors related to child development. Table 6 presents the indicators being evaluated. [128]

TABLE 6. INDICATORS FOR THE QUÉBEC LONGITUDINAL STUDY OF CHILD DEVELOPMENT
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Cognitive Development (based on cognitive tasks)
Mental Attention (FIT, IST)
Working Memory (VCR, ROST, NEPSY)
Visual Coordination (IST)
Literacy and Language (PPVT, NEPSY, K-ABC, RAN)
Numeracy (NKT, CAT/2 MOD)
Analytical Processing (WWPSI-R, WISC-III, PEFT)
Spelling
School Readiness (Lollipop)
Other Direct Observations and Measurements of the Children
Motivation for Learning
Relations with Peers
Physical Condition (weight, height, endurance, strength, adiposity)
Psychomotor Development
Relations with the Teacher
Environmental factors (parents' questionnaires)
Family Demographics
Socioeconomic Conditions
Social Capital

Parent/Child Interactions
Mother/Father Relations
Health Condition
Child Care Services Use
Physical, Social, and Artistic Activities
Reading Habits and Computer Use
Nutrition Habits
Sleep Habits
Child Behaviour
Tobacco, Alcohol, and Drug Use Etc.
Environmental factors (teacher's questionnaire)
Academic Aptitude
Relations with Peers
Child Behaviour
School Atmosphere
Child's Best Friend's Behaviour
Administrative data
Medical Record at Birth
Dental Health (RAMQ)
Enrolment Record (MELS)
Report Cards (School Boards)

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The final two approaches use the *Early Development Instrument* (EDI), a 104-item questionnaire completed by kindergarten teachers or early childhood educators. The EDI assesses children's development in five key domains: physical, social, emotional, language/cognitive, and communication skills. The EDI incorporates major developmental areas, provides data that can be aggregated to various group and geography levels, and has established validity and reliability. [129, 130] Collected on all kindergarten children across a jurisdiction, the EDI provides detailed information at the local neighbourhood and community levels.

The School Readiness to Learn Project conducted by the Offord Centre of Child Studies in Ontario is coordinating the evaluation of kindergarten children's EDI results in the following counties: Australia, Canada, Chile, Egypt, England, Holland, Jamaica, Kenya, Kosovo, Mexico, Moldova, Mozambique, New Zealand, and the USA. According to their website, "Much of our work centres around population-based surveys conducted over several decades. This longitudinal research allows us to identify those children who are at risk, and devise effective strategies and programs to improve their chances of success. Antisocial behaviour and conduct disorder, early risk factors, autism, child and adolescent depression, child physical abuse and neglect, bullying, the health of First Nations and disadvantaged children, school-based prevention programs, school readiness to learn and community report cards are just some of the interests being pursued by our research faculty". [131]

In British Columbia, _The Human Early Learning Partnership_ collects data on all kindergarten children from 469 neighbourhoods and links that data with census, health and educational sources. [132] This extensive population health data allows the mapping of school readiness across the entire province and provides information for researchers, policy makers, social, health and educational professionals and community organizations to determine needed services. See Table 7 for an example of the indicators used to compare with the EDI domains in British Columbia. [133]

TABLE 7. INDICATORS USED TO EXPLAIN SCHOOL READINESS IN BRITISH COLUMBIA BY THE HUMAN EARLY
LEARNING PARTNERSHIP, 2005
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Population 5 Years of Age:	Percent of population aged 5 years or under
Foreign Mother Tongue:	Percent of population whose mother tongue is neither English nor French
Foreign Home Language:	Percent of population whose mother tongue is neither English nor French
Linguistic Isolation:	Percent of population that does not speak either English or French fluently
Recent Immigration:	Percent of population that immigrated to Canada during 1996 – 2001
Residential Mobility:	Percent of population that changed address in the past year 2000-2001
Aboriginal Population:	Percent of population reporting any aboriginal status (self-identified)
No Grade Nine Education:	Percent of population aged 20 years and above that do not have grade nine completion
No High School Education:	Percent of population aged 20 years and above that do not have high school completion
University Education:	Percent of population aged 20 years and above that have any university degree
Unemployment Rate:	Seasonally-adjusted unemployment rate for all individuals ages 25 and over

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Youth Unemployment:	Seasonally-adjusted unemployment rate for all individuals aged 15 through 24
Unemployment, Families with Young Children:	Seasonally-adjusted unemployment rate for all individuals aged 25 and over in households with children under the age of six
Lone-parent Families:	Estimate of the percentage of census families headed by a lone parent
Median Family Income:	Median annual family income
Average Employment Income:	Average annual employment income
Income From Government Transfers:	Percent of all income in this region that is derived from any government transfer
Persons Below LICO:	Percent of individuals living in households below LICO (low-income cutoff)
Unpaid Child Care:	Percent of individuals over the age of 15 who are spending 15 or more hours per week engaged in unpaid child care
Homeownership Rate:	Percent of occupied private dwellings that are owner-occupied (this excludes farm and on-reserve dwellings)
Housing Stress Index:	Percent of households that are spending 30% or more of their gross income on shelter costs
Social Index:	A measure of socioeconomic risk scored from 0 to 9, where 0 has the least amount of risk while 9 has the greatest.

Similar efforts are being conducted in Manitoba by the Manitoba Centre for Health Policy (MCHP) where a _Population Health Research Data Repository_ has been established. The repository is a comprehensive collection of administrative, registry, survey, and other databases of Manitoba residents. It was developed to describe and explain patterns of health care and profiles of health and illness, facilitating intersectoral research in areas such as health care, education, and social services. [134]

United States

A comprehensive and coordinated school readiness initiative is taking place in the United States with the *National School Readiness Indicators Initiative*: A 17 State Partnership. [135, 136] The school readiness indicators that are included in this initiative were selected because they have the power to inform state policy action on behalf of young children, emphasizing physical health, economic well-being, child development and supports for families. This multi-state initiative involves teams from 17 states, including Arizona, Arkansas, California, Colorado, Connecticut, Kansas, Kentucky, Maine, Massachusetts, Missouri, New Hampshire, New Jersey, Ohio, Rhode Island, Vermont, Virginia and Wisconsin. Using the *Ready Child Equation* mentioned earlier, the set of core indicators collected by each state can be found in Table 8.

TABLE 8. CORE INDICATORS OF THE AMERICAN NATIONAL SCHOOL READINESS INDICATORS INITIATIVE

Ready Children

Physical Well-Being and Motor Development % of children with age-appropriate fine motor skills **Social and Emotional Development** % of children who often or very often exhibit positive social behaviors when interacting with their peers **Approaches to Learning** % of kindergarten students with moderate to serious difficulty following directions **Language Development** % of children almost always recognizing the relationships between letters and sounds at kindergarten entry **Cognition and General Knowledge** % of children recognizing basic shapes at kindergarten entry

Ready Children

Mother's Education Level % of births to mothers with less than a 12th grade education **Births to Teens** # of births to teens ages 15-17 per 1,000 girls **Child Abuse and Neglect** Rate of substantiated child abuse and neglect among children birth to age 6 **Children in Foster Care** % of children birth to age 6 in out-of-home placement (foster care) who have no more than two placements in a 24-month period

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Ready Communities

Young Children in Poverty
% of children under age 6 living in families with income below the federal poverty threshold

Supports for Families with Infants and Toddlers
% of infants and toddlers in poverty who are enrolled in Early Head Start

Lead Poisoning
% of children under age 6 with blood lead levels at or above 10 micrograms per deciliter 20

Ready Services – Health

Health Insurance
% of children under age 6 without health insurance

Low Birthweight Infants
% of infants born weighing under 2,500 grams (5.5 pounds)

Access to Prenatal Care
% of births to women who receive late or no prenatal care

Immunizations
% of children ages 19-35 months who have been fully immunized

Ready Services - Early Care and Education

Children Enrolled in an Early Education Program
% of 3- and 4-year-olds enrolled in a center-based early childhood care and education program (including child care centers, nursery schools, preschool programs, Head Start programs, and pre-kindergarten programs)

Early Education Teacher Credentials
% of early childhood teachers with a bachelor's degree and specialized training in early childhood

Accredited Child Care Centers
% of child care centers accredited by the National Association for the Education of Young Children (NAEYC)

Accredited Family Child Care Homes
% of family child care homes accredited by the National Association for Family Child Care (NAFCC)

Access to Child Care Subsidies
% of eligible children under age 6 receiving child care subsidies

Ready Schools

Class Size
Average teacher/child ratio in K-1 classrooms

Fourth Grade Reading Scores
% of children with reading proficiency in fourth grade as measured by the state's proficiency tests

Although each state has agreed to collect this core set of indicators, most actually collect more. As an example, Colorado tracks 62 school readiness indicators (see Table 9). [137]

TABLE 9. COLORADO'S SCHOOL READINESS INDICATORS (2004)

Ready Child

Physical Well Being and Motor Development
1 Percent of low birth weight births
2 Percent of children with up-to-date immunizations by 2 years of age
3 Percent of overweight or obese children
Developmental Physical Well Being and Motor Development Indicators
4 Percent of children with health insurance
5 Percent of children who have health care needs that were not met
6 Percent of children who have oral health needs that were not met
7 Percent of 3rd graders with untreated tooth decay
8 Percent of children achieving developmental milestones

Social Emotional

9 Child abuse and neglect rate
Developmental Social Emotional Indicators
10 Percent of children with social/emotional difficulties
11 Percent of children with ability to have secure attachment
12 Percent of children able to participate in group
13 Percent of preschool-3rd grade children who are disruptive in class/overly aggressive
14 Percent of children who act isolated and withdrawn
15 Percent of children who have the ability to self-regulate
16 Percent of children who demonstrate prosocial behavior
17 Number of children expelled or suspended from child care
Language and Cognitive Development
18 Proficiency in third grade reading test
19 Achievement gap in 3rd grade reading test
20 Percent of English language learners in elementary schools
21 Percent of infants with newborn hearing screening
22 Proficiency in 5th grade math test
Developmental Language and Cognitive Development Indicators
23 Percent of infants and children read to on regular basis
24 Percent of K-3 students absent more than 10 days in a school year

Ready Family

25 Percent of children living in poverty
26 Percent of children in low-income families (below 200% of the
federal poverty level)
27 Percent of infants born to a high-risk mother
28 Out-of-home placement mobility rate
29 Number of homeless students
Developmental Ready Family Indicators
30 Percent of families with children who are achieving economic
self-sufficiency
31 Percent of families with children experiencing
hunger/food insecurity

32 Percent of parents with poor mental health
33 School change rate

Ready School

34 Average elementary school class size
35 Full-day kindergarten availability rate
36 Number of elementary schools with a school-based health center
37 Percent of underperforming elementary schools
38 Percent of schools with identified construction needs exceeding
local resources
Developmental Ready School Indicators
39 Percent of children entering kindergarten with individual transition plan
40 Percent of K-3 teachers with early childhood credential
41 Parent involvement rate
42 Percent of K-3 classrooms with appropriate class size
43 Percent of elementary schools offering family and community services

Ready Community

Early Care and Education
44 Number of credentialed early care and education educators
45 Capacity of licensed child care programs
46 Child care subsidy enrollment rate
Developmental Early Care and Education Indicators
47 Percent of high-quality child care programs
48 Capacity rate of publicly funded preschool programs
49 Percent of Colorado counties identified as having a shortage of primary health care providers
50 Percent of primary care physicians willing to accept Medicaid and/or CHP+
Developmental Health Care Indicators
51 Percent of Colorado counties identified as having a shortage of oral health providers
52 Percentage of Colorado counties identified as having a shortage of mental health providers
Quality of Life
53 Rate of unemployment among people with children
54 Housing affordability for low-income families
55 High school drop out rate
56 High school graduation rate
57 Juvenile violent crime arrest rate
58 Violent crime rate
Developmental Quality of Life Indicators
59 Percent of children who have been exposed to violence
60 Availability rate of public amenities and community resources
61 Availability and access to family literacy services
62 Number of families receiving structured family literacy services

Another American initiative is the _National Household Education Survey,_ which collects descriptive educational data with a special focus on school readiness, including home literacy activities, school adjustment, and early school experiences. This repeated cross-sectional survey focused on children 3-7 years old (n=10,888) and was conducted in 1993, 1999, and 2007, with the adult most knowledgeable about the sample child. This survey information is included in this review because it has an extensive health component. Table 10 lists the indicators used. [138]

TABLE 10. NATIONAL US HOUSEHOLD EDUCATION SURVEY-SCHOOL READINESS INDICATORS

Socioemotional Development	Parental warmth and affection
Problem behaviors	Language stimulation
Social competence	Available learning materials (books computers) in the home
Attachment	
Self-regulation	Developmentally inappropriate expectations of child's behavior
Post-traumatic stress	
Peer relationships	Harsh parenting
Positive affect	Abuse/neglect of child
Internalizing behaviors (sad, unhappy or depressed)	Parental stress
Mastery motivation	Aggravated Parenting
ADHD, attentional issues, hyperactivity	Parental domestic violence
Cooperation/compliance	Regular bed time
Intellectual Development	Regular meal time with family
Verbal proficiency	Regular seat belt use
Quantitative proficiency	Adequate childproofing of the home
Expressive language	Health/Safety issues in home environment (lead, medicine)
Receptive language	
Fine and gross motor skills	Parenting style
Basic concepts mastery	Parental responsivity
Approaches to learning	Contact with noncustodial parent
Pre-reading behaviors	Variety of experience
Stammering/stuttering	HOME scale
Received early intervention or special education services	Parent conflict resolution styles
	Exercise
Health	Unmet health needs
Blood lead level	TV and video time
Obesity	Food insecurity
Low/very low birth weight, and medical follow-up	Family participation in religion
Chronic illness/disability	**Health Care Receipt and Coverage**
Failure to thrive	Usual source of care
Premature birth	Developmental screening
Asthma	Health insurance coverage, and % eligible but not enrolled
Iron deficiency	
Vision problems	S-CHIP coverage
Nutritional status	Screening for hearing and vision problems
Hearing problems	Dental care receipt
Head injuries	Office visits
Breastfeeding	Well-child visits
Immunizations	Hospitalization (accident)
Treatment for emotional/mental health problems	Hospitalization (injury)
Family Functioning, Parent/Child	Hospitalization (illness)
Interactions and Health Practices	Medical home
Parent reads to child	**Parental Health**

Parental depression

Parental drinking (pre and post-natal)

Parental smoking (pre and post-natal)

Parental drug use

Regular physical activity

Overall health rating

Parental disability or chronic health condition

Parental sense of social support

Community/Neighborhood

Violence levels

Poverty rate

Perceived safety levels

Neighbors can be counted on to help

Neighbors intervene with children's misbehavior

Adult unemployment

Crime rates

Clean and safe playgrounds

Housing stock quality

liquor licenses

Employers with maternity leave

Percentage of single mothers

Child Care Participation and Quality

Hours spent in care each week

Type of care

Teacher/child ratio

Primary care source

Use of multiple arrangements

Teacher education levels

ECE specific training or education for teachers

Parental involvement in care

Parent-caregiver/teacher communication

Staff years of experience

Health and safety of care (sanitation, safe play)

Presence of curriculum

ITERS/FDCRS/ECERS or other observational quality measures

Stability of care

Parental Satisfaction with care

Demographics

Race and Hispanic origin

Language spoken in home

Family structure

Income

Income by source

Parental employment

Immigrant status (1st and 2nd generation)

Parental educational attainment

Non-resident parent information

Poverty status

Children in foster care

Homeless children

Linguistic isolation

Parental illiteracy

Births to single teen mothers

Children w/ parents in prison

Food stamp receipt

Geographic location

Siblings

TANF receipt

WIC receipt

Child care subsidy receipt

Number of young children in family

Urban/rural marker

MSA/non-MSA area

International

A number of countries are collecting longitudinal, national data on their children's well-being.[139] The following is a list of some of the major evaluations worldwide:

- Birth to Twenty (South Africa)
- Born in Bradford (UK)
- Children and Young Adults of the 1979 National Longitudinal Survey of Youth
- Danish Longitudinal Survey of Children
- ELFE (Growing up in France),
- Growing Up in Australia
- Growing Up in Ireland
- Growing Up in Scotland
- Korea Youth Panel Survey
- The National Longitudinal Survey of Children & Youth (CAN), Québec Longitudinal Study of Child Development.

For more information on early childhood development projects occurring internationally, please see the _World Bank's Directory of supported programming_

http://siteresources.worldbank.org/INTECD/Resources/Globaldirectory03.pdf

In 2007, an evaluation of child development across five developed English speaking countries (Canada, US, Australia, New Zealand and the United Kingdom) was conducted by _The Foundation for Child Development_.[140] Table 11 presents the indicators examined (_The Child and Youth Well-Being Index_).

TABLE 11. CHILD AND YOUTH WELL-BEING INDEX (CWI) PROJECT. INTERNATIONAL COMPARISONS REPORT (2007). THE FOUNDATION FOR CHILD DEVELOPMENT

Child Poverty	Percentage of children ages 0-17 living below 50% of the median adjusted disposable income
Secure Parental Employment	Percentage of working-age households with children without an employed parent
Single Parent Families	Percentage of all children ages 0-17 living in single-mother families
Low Birth Weight	Percentage of infants with low birth weight
Infant Mortality	Number of deaths before age 1 per 1,000 live births
Child and Adolescent Mortality	Number of deaths per 1,000 children ages 1-19
Overweight	Percentage of young people who are overweight according to BMI, ages 13 and 15
Subjective Health	Percentage of young people rating their health as "fair or poor", ages 11, 13 and 15
Teen Births	Number of births per 1,000 girls ages 15-19
Smoking, and Drinking	Percentage of young people reporting smoking daily, ages 11, 13, and 15 Percentage of young people reporting ever been drunk twice or more times, ages 11, 13, and 15
Drugs	Percentage of young people who have used cannabis in the last 12 months, age 15
Reading and Mathematics Achievement	Math and reading score for young people age 15 based on OECD's Programme for International Student Assessment (PISA)
High School Completion	Percentage of persons ages 25-34 who have completed high school
Not Working or in School	Percentage of young people ages 15-19 not working or in school
Bachelor's Degree	Percentage of persons ages 25-34 who have received a bachelor degree
Preschool Enrollment	Percentage of children ages 3-4 enrolled in preschool programs
Suicide	Number of suicides per 100,000 persons, ages 15-24

Since this environmental scan is focused on health and school readiness, a category of health indicators for school readiness is presented.

Health Indicator Recommendations for School Readiness

Emel and Alkon conducted a review of school readiness initiatives across the United States and focused on the health component of these programs. They provide the following recommendations of specific health components that should be included in school readiness initiatives. [141]

Children need to be healthy in these areas:
a. Medical/physical, specifically:

> ii. lead poisoning
> iii. asthma
> iv. nutrition
> v. safety from injuries
> vi. safety from child abuse/neglect

b. Vision
c. Oral health
d. Social and emotional development
e. Mental health

In order to address these issues, programs should provide or facilitate easier access to:
a. Screenings for medical, oral, vision, and mental health issues
b. A medical home or regular place of medical care
c. A Child Care Health Consultant
d. Access to health insurance for children and mothers
e. Nutrition assistance such as WIC and Food Stamps
f. An integrated approach that serves **both** children and parents/caregivers
g. Parent education regarding children's health issues and developmental milestones
h. Health education for early care and education professionals

Programs _may_ also want to address these issues:
a. Maternal health
b. Educating pediatricians, dentists, and other child health care providers about the importance of health to school readiness
c. Collaborating with other agencies to achieve the above recommendations

Associated with school readiness determinants and indicators are interventions and promising practices that are used to promote learning, health and the well-being of young children.

Health Interventions for School Readiness

Rationale

Interventions for school readiness from a health perspective can range from assessing and treating children to public health policies that support children and their families. One way to determine which interventions are needed is to explore why some children do not do well in their early schooling. The health and social factors associated with grade retention in kindergarten and grade 1 identified in a large study (n= 9996) provides direction for intervention efforts. Byrd and Weitzman [142] found that the following factors were independently associated with increased risk of grade retention: poverty, male gender, low maternal education, deafness, speech defects, low birth weight, enuresis and exposure to household smoking. As well, low maternal education and not living with both biological parents at age 6 years was independently associated with an increased risk of retention. Recurrent otitis media, race, low maternal age and child behavior problems were also was associated with early grade retention. The common child health problems identified by this study led the authors to recommend increased surveillance by health professionals. Also recommended, and consistent with later research, includes early health interventions, family support programs, and early childhood education programs. This review also presents promising research associated with comprehensive community-based services, transitional practices that support school readiness and broader community-based public health policy initiatives.

The conclusions of Emel and Alkon and Byrd and Weitzman mentioned above, informed the inclusion criteria decisions in this environmental scan for identifying proven interventions for school readiness. Please note that the interventions and promising practices identified are not considered an exhaustive list but rather, reflective of the areas identified as important for school readiness from a health perspective. In order to identify the most relevant health based interventions and practices for promoting school readiness, the following primary data sources were used:

1) **Internet review** using the following keywords: school readiness, health, determinants, indicators, early health interventions, early childhood education/care, school transitions, environmental health, health promotion/prevention, young children.

Searchable databases on evidence-based practice

2) **The Promising Practices Network (PPN)** is dedicated to providing quality evidence-based information about what works to improve the lives of children, youth, and families. The PPN site features summaries of programs and practices that are proven to improve outcomes for children. All of the information on the site has been screened for scientific rigor, relevance, and clarity. See http://www.promisingpractices.net/default.asp

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3) **National Registry of Evidence-based Programs and Practices (NREPP)** is a searchable database of interventions for the prevention and treatment of mental and substance use disorders. See http://nrepp.samhsa.gov

4) **The Office of Juvenile Justice and Delinquency Prevention's Model Programs Guide (OJJDP)** is designed to assist practitioners and communities in implementing evidence-based prevention and intervention programs that can make a difference in the lives of children and communities. The MPG database of evidence-based programs covers the entire continuum of youth services from prevention through sanctions to re-entry. The MPG can be used to assist juvenile justice practitioners, administrators, and researchers to enhance accountability, ensure public safety, and reduce recidivism. See http://www.dsgonline.com/mpg2.5//mpg_index.htm

 5*)* **Coalition for Evidence-Based Policy: Social Programs that Work (CEBP)** seeks to identify those social interventions shown in rigorous studies to produce sizable, sustained benefits to participants and/or society. The purpose is to enable policymakers and practitioners to readily distinguish the few interventions that are truly backed by rigorous evidence from the many that claim to be, so that they can use such knowledge to improve the lives of the people they serve. See http://www.evidencebasedprograms.org

Expert reviews and syntheses

6) **The Rand Corporation.** *Proven benefits of early childhood interventions* (Rand Labor and Population Research Brief, RB-91450PNC). Santa Monica, CA: Rand Corporation. See http://www.rand.org

7) **Child Trends, What Works Database**. Programs and interventions that may influence outcomes for youth and young children. See http://www.childtrendsdatabank.org/WhatWorks.cfm

8) **Encyclopedia on Early Childhood Development**, Centres of Excellence for Children's Well-being. See http://www.child-encyclopedia.com/en-ca/home.html

9) **Human Early Learning Partnership**, University of British Columbia, The Human Early Learning Partnership (HELP) is an interdisciplinary research network of faculty, researchers and graduate students from British Columbia's six major universities. HELP facilitates the creation of new knowledge, and helps apply this knowledge by working directly with government and communities. See http://www.earlylearning.ubc.ca/SDPP/generalresources.htm

10) **Canadian Council on Learning's Early Childhood Learning Knowledge Centre** (ECLKC) is a national, independent, and non-profit corporation that is committed to improving learning across the country and across all walks of life. See http:// www.ccl-cca.ca/childhoodlearning

11) **International Society on Early Intervention**

The primary purpose of the ISEI is to provide a framework and forum for professionals from around the world to communicate about advances in the field of early intervention. The membership of ISEI is composed of basic and clinical researchers relevant to the field of early intervention representing a diverse array of biomedical and behavioural disciplines, as well as clinicians and policy-makers in leadership positions. See http://depts.washington.edu/isei/

There exists ample information on evidence-based interventions and practices for school readiness through these databases, clearinghouses, meta-analyses and systematic reviews.

Identified interventions and practices which had a health component, addressed prenatal education or children from 0-6 years, identified positive child outcomes and focused on school readiness or healthy/safe children were categorized into proven or promising practices. Proven practices were further subdivided into: developmental assessment and access to early interventions; family support services; early childhood care, education and family support; and early childhood social-emotional interventions. The promising practices section includes comprehensive service programs (health, education, family support) as well as practices on supporting transitions to kindergarten and promoting child friendly cities and communities. In total, 19 proven interventions were identified and five promising practices. See below for the names of the programs or interventions:

<div align="center">

Proven Interventions

</div>

Developmental Assessment and Access to Early Interventions
- Developmentally Supportive Care: Newborn Individualized Developmental Care and Assessment Program (NIDCAP)

- The Infant Health and Development Program (IHDP)

- The Healthy Steps Approach

- Reach Out and Read

- Trauma-Focused Cognitive Behavioral Therapy (TF-CBT)

Family Support Services
- Nurse Family Partnership (NFP)

- Healthy Families New York (HFNY)

- DARE to be You

- Triple P--Positive Parenting Program

- Families and Schools Together (FAST)

- Incredible Years

Early Childhood Care, Education and Family Support
- Early Head Start

- Carolina Abecedarian Project

- Child-Parent Centers

- Perry Preschool Project

Early Childhood Social-Emotional Interventions
- Primary Project

- Promoting Alternative THinking Strategies (PATHS)

- Al's Pals: Kids Making Healthy Choices

- Fast Track

Promising Practices

- Toronto First Duty

- SmartStart

- Sure Start

- Supporting Transitions from Preschool to Kindergarten

- Promoting Child Friendly Cities and Communities

All of the interventions in the "proven" category have shown significant differences in children's outcomes in one or more of the following categories: cognitive/achievement, behavioural/emotional, educational, child maltreatment, and/or health. Although the criteria and methods differed slightly between the first four searchable databases (see Appendix 2 for a description of the criteria), all required well designed randomized control trials or quasi experimental methods, adequate sample sizes and significant differences on child outcomes between the experimental and control group, to be included as a "proven" intervention.

More latitude was given in the "promising practices" section to ensure an inclusive view of emerging interventions. All sources in this section have research backing the intervention but the studies may still be on-going, have smaller sample sizes or include mixed methods such as qualitative and quantitative approaches. Appendix 3

provides detail on each intervention or practice chosen, contact information, and which source(s) supports it. The following is a summary of characteristics and child outcomes of each intervention by category.

<div align="center">**Proven Interventions**</div>

Developmental Assessment and Access to Early Interventions

There is a large body of evidence that shows that early identification of health issues through screening, along with appropriate services, is beneficial to children. [143, 144, 145, 146, 147] Both the *Newborn Individualized Developmental Care and Assessment Program* (NIDCAP) and *The Infant Health and Development Program* (IHDP) involve primary health care for low birth-weight babies. As well, both programs are family-centered, child-focused, developmentally-based and include family support services such as home visiting and parent education (IHDP also includes centre-based early care). Finally, both proven programs use multidisciplinary teams and continued surveillance over an extended period. The NIDCAP has shown to assist with children's health outcomes (shorter stays on respirators, supplemental oxygen and feeding tubes), improved behavioural outcomes,[148, 149] and a lower incidence of developmental delay. [150] Positive cognitive effects (IQ, vocabulary, receptive language, and visual-motor skills) have been identified for the IHDP,[151, 152] particularly in the heavier birth-weight babies.

The other early health interventions identified by this scan also include primary health care and parent support services. *The Healthy Steps for Young Children Program* is a universal, multidisciplinary approach that incorporates developmental specialists and enhanced developmental services into paediatric care in the first 3 years of life. Also provided is home visitation, referrals for other medical services, well baby and family health visits and resources on child development and parenting. A large randomized control trial found improved parenting practices five and a half years later. Specifically, families that had received *Healthy Steps* services were more satisfied with care (agreed that the paediatrician/nurse practitioner provided support and more likely to receive needed anticipatory guidance), used less severe discipline, and often/almost always negotiated with their child. As well, these parents were more likely to report a clinical or borderline concern regarding their child's behavior and to read with their child. [153] *Healthy Steps* has also been associated with positive outcomes in timely well-child care, immunization rates, breastfeeding, television viewing, injury prevention, and discipline strategies. Prenatal initiation of services was associated with larger child expressive vocabularies at age 2 years. [154]

During well-baby visits in the *Reach Out and Read (ROR)* program, doctors and nurses provide developmental information and resources to parents and new books for children. Research of the ROR program indicates a significant effect on parental behavior, beliefs, and attitudes towards reading aloud, [155, 156] as well as improvements in the language scores of young children receiving the intervention. [157, 158]

The final early health intervention involves intensive case management services targeted to address emotional and behavioural problems in children (*Trauma-Focused Cognitive Behavioral Therapy –TF-CBT*)*.* TF-CBT is a psychosocial

treatment model that focuses on both children and their parents/guardians. It addresses a wide range of child traumatic experiences such as sexual abuse, domestic violence, post traumatic stress syndrome, depression and traumatic loss. The treatment has shown to be effective for addressing child behavior problems, symptoms of posttraumatic stress disorder, child depression, feelings of shame and parental emotional reaction to child's experience of sexual abuse. [159, 160, 161, 162]

Family Support Services

The family support services identified are all prevention programs with the goal of enhancing parental skills and behaviors and hence improving children's environments, experiences and developmental outcomes. Although we know that helping families directly influences children's outcomes, the interventions chosen were restricted to those that had evidence of positive outcomes for children.

As mentioned, all of the identified programs are preventive in nature and focused on the parent (knowledge, behavior, attitudes, mental health, substance abuse, child maltreatment) and/or the child (social, emotional, behavioural, health or academic competencies). The first four programs (*Nurse-Family Partnership, Healthy Families New York, Incredible Years, Dare to be You*) specifically target high risk parents, i.e., those who have low SES, young in age, or identified mental health, substance abuse, or child maltreatment histories.

The Nurse-Family Partnership Program (NFP) focuses solely on first-time mothers and has the following goals: 1) to improve pregnancy outcomes by promoting health-related behaviors; 2) to improve child health, development and safety by promoting competent care-giving; 3) to enhance parent life-course development by promoting pregnancy planning, educational achievement, and employment; 4) enhance families' material support by providing links with needed health and social services; and 5) promote supportive relationships among family and friends. Through home visits with a registered nurse, the program has shown to be effective for better prenatal care (e.g., attended childbirth classes, accessing community services, and reduced smoking), [163] safer home environments and less emergency room visits for the child. [164, 165] At age 15 years, the child whose mother participated in NFP had significantly fewer arrests, convictions, and violations of probation. As well, they were less likely to run away, had fewer sexual partners and drank less alcohol. [166, 167]

Another proven home visiting program, *Healthy Families New York* (HFNY), also targets parents at risk. The goals of the program are to: 1) promote positive parenting skills and parent-child interaction; 2) prevent child abuse and neglect; 3) ensure optimal prenatal care and child health and development; and 4) increase parents' self-sufficiency. Home visitors encourage healthy prenatal behavior, offer social support, and provide a link to medical and other community services. Visits by trained paraprofessionals have shown to result in mothers who are less

likely to deliver low birth weight babies, [168] and report less child neglect, severe physical abuse, minor physical aggression, or psychological aggression. [169]

A community-based prevention program, *Dare to be You,* also has shown significant positive parent and child outcomes for families at risk. The goals of the program are to: 1) improve parents' self-esteem; 2) increase parents' realization that consequences are brought about by their actions, rather than by fate, chance or a "powerful other," thereby changing the "locus of control" of consequences from an external source to an internal source; 3) enhance decision-making skills through effective reasoning; 4) increase communication skills between parents and children, particularly to improve children's self-esteem, decision making, and problem-solving skills; 5) learn effective stress management; 6) learn the speed at which children should develop in order to decrease unrealistic expectations; and, 7) strengthen peer support and reduce isolation. Using a workshop format (2 hours for 10-12 weeks) for parents, their young children, and the children's siblings (together and separately), different parenting techniques are taught. A randomized control trial found that those parents participating in the program had significantly increased feelings of confidence in their parenting skills and higher levels of self-esteem, a greater sense of personal control, greater reasoning skills and better communication between themselves and their child. As well, their children exhibited significant increases in their development and age-appropriate behaviors and exhibited fewer "oppositional behaviors" compared with the control group. [170]

Another community-based intervention, *Triple P,* provides five modules or levels for preventing or treating social, emotional, behavioral, and developmental problems in children (0-12 years) by enhancing their parents' knowledge, skills and confidence. The first method is a universal program designed to increase community awareness of parenting resources, encourage parents to participate in programs, and communicate solutions to common behavioral and developmental concerns using a media-based information strategy. The next four modules all use face-to-face consultations or group sessions to: a) provide advice on child development and solutions for mild behavioral problems (Selected Triple P); b) address mild to moderate behavior difficulties (Primary Care Triple P); c) teach positive parenting skills for more severe behavior difficulties such as aggressive or oppositional behavior (Standard Triple P and Group Triple P); and, d) address severe child behavior problems as well as other family issues such as relationship conflict, parental depression or high levels of stress (Enhanced Triple P). Evaluations of the program have shown decreased child disruptive behavior[171, 172, 173, 174] and fewer child conduct problems, peer problems, emotional symptoms and hyperactivity. [175]

The last two family support interventions are provided in educational or early care settings (*Family and Schools Together* and *Incredible Years*). *Family and Schools Together* or FAST is also a universal, selected and indicated program whose goal is to promote mental health and family functioning as well as prevent youth substance abuse, school failure and stress. The universal component consists of parent outreach. In the parent education

component, parents/caregivers, professionals (e.g., substance abuse or mental health professionals) and school personnel meet after school to discuss parent-child bonding, parent involvement in schools, parent networks, family communication, parental authority, and social capital over an 8 week period with an option of monthly group reunions for 2 years. Evaluation of the program has indicated a positive effect for teacher-reported externalizing behaviors, teacher-reported aggressive behaviors, and parent-reported withdrawal symptoms, with positive behavioural effects sustained 1 year later. [176, 177] As well, children of parents who attended the FAST program showed greater academic competence 1 year later according to their teachers. [178, 179]

The final family support intervention, _The Incredible Years_, is a set of comprehensive curricula for children ages 2 to 8 and their parents and teachers. It targets high-risk children or children displaying behavior problems. The curricula are designed to work jointly to promote emotional and social competence and to prevent, reduce, and treat children's behavioural and emotional problems. The Incredible Years parent training involves 12 to 14 weekly sessions, emphasizing such parenting skills as how to set limits, how to play with children, and how to handle misbehaviour, incorporating videotaped scenes to encourage group discussion and problem solving. The child-training program uses a small-group curriculum for children exhibiting conduct problems, and is offered in weekly sessions for 18 to 20 weeks by counsellors or therapists. Entitled the _Incredible Years Dinosaur Social Skills and Problem-Solving Child Training Program_, it teaches skills such as emotional literacy, empathy or perspective taking, friendship and communication skills, anger management, interpersonal problem solving, and how to be successful at school. Studies indicate that significantly fewer problem behaviors have been reported by parents, [180, 181, 182] teachers and independent raters [183] for those children whose parents completed the parent training component. As well, the child-training component has shown to be effective for parent-reported total problem behaviors, teachers' reports of aggression toward peers, and independent observations of child deviance, noncompliance and social problem-solving ability. [184]

Early Childhood Care, Education and Family Support

Programs which incorporate quality early childhood care, education and family support have been shown to be effective in enhancing the cognitive, emotional, and social development of preschoolers, [185, 186] with longer-term gains seen in cognitive test scores, lower rates of grade retention, special education placement and higher rates of high school graduation. [187] The programs identified by this scan have all shown effectiveness on children's outcomes related to school readiness and have a large amount of research supporting their programming. All of these earlier programs were developed to ameliorate the effects of poverty and thus focused on disadvantaged children and families. As well, all provided child-centered, family focused comprehensive services that included a health component.

The goal of _The Carolina Abecedarian Project_ was to provide a comprehensive early education program for young children at risk for developmental delays and school failure. Typical characteristic of evaluation families included

young single African-American (98 percent) mothers with a low education and IQ level (M = 85). The preschool intervention component (available to infants from 6 weeks until entry into kindergarten) provided a stimulating daycare setting 6-8 hours a day, 5 days per week, and 50 weeks per year. The curriculum was focused on promoting school readiness, specifically enhancing cognitive and linguistic development while providing an enriched language environment that was responsive to children's needs and interests. In addition, children received nutritional supplements and disposable diapers, along with paediatric care and supportive social work services. After the children turned 3 years old, they received a more structured set of educational curricula, which increasingly became similar to programs in the local public kindergarten.

As well as the preschool intervention, some children were provided the opportunity for extended care to grade 3, which included a resource teacher who conducted home visiting, provided parent and child tutoring, developed an individualized set of home activities to supplement the school's basic curriculum in reading and math, and liaised and advocated for the family at school and in the community. Children were followed for 21 years, with the evaluation focused on cognitive development, school performance, physical health, substance abuse and juvenile justice. The preschool intervention was shown to be effective for significantly increasing mental development, cognition, language, perceptual performance, memory, and IQ compared to controls after 12 months. [188] Significant IQ gains were still identified at 54 months even after controlling for maternal IQ and home environment. [189] Children attending both the early intervention and the after school enrichment program scored higher in academic achievement compared to the early intervention alone, while those in only the after school program did better than the controls but not as well as the centre-based program. [190] Perhaps the reason that this demonstration study is so often identified as exemplary is the fact that the preschool intervention has shown lasting effects on intelligence scores, reading, and math up to age 21 years. [191, 192]

Another centre-based intervention, the *Child–Parent Center Program (CPC)* [193] also demonstrates the effectiveness of a quality early childhood education program for children at risk. The CPC program provides comprehensive health, educational and family-support services to economically disadvantaged children from preschool to third grade. The focus of the program is to promote children's academic success, particularly reading/language skills,[194] provide comprehensive services and to facilitate parent involvement in children's lives. Comprehensive services include: a) attending to their nutritional and health needs (i.e. free breakfasts, lunches and health screening); b) coordinated adult supervision, including a CPC head teacher, parent resource teacher, school-community representative, and a teacher aide for each class; c) funds for centralized in-service teacher training in child development as well as instructional supplies; and d) an emphasis on reading readiness through reduced class size, reading and writing activities in the learning center, reinforcement and feedback.[195]

The effectiveness of the program has been examined over an 18 year period. [196, 197] Nine hundred and ninety-eight children who participated in the CPC program were compared to 550 children in kindergarten programs also located in low SES neighbourhoods. Along with long term benefits, the CPC program found significant associations between program participation and higher school achievement, lower rates of grade retention and placement of special education at age 15, lower rates of child maltreatment, lower dropout rates and higher high school completion rates at age 20. [198, 199] By providing early literacy support, enough resources both physical and human, mandated parental involvement and comprehensive nutritional and health services, this program has shown to be a model for ameliorating the negative effects of poverty on children's well-being.

Another centre-based program considered a model for the enduring and long lasting effects of early intervention is *The Perry Preschool Project*. This project also targeted at-risk students (3- and 4-year-old African-American children living in poverty who had low IQ scores). The teachers conducted daily two and one-half hour-long classroom sessions on weekday mornings for children and weekly one and one-half hour-long home visits to each mother and child on weekday afternoons over a 30 week school year. The focus of the centre-based curriculum was to promote intellectual, social and emotional learning and development through child initiated activities and play. The goal of the home visits was to involve the mother in the educational process in order to help her provide education support and implement the curriculum within the home. The Perry Preschool Project study followed the children until the age of 27, documenting the long-term effects of program participation on their lives. Below lists the large number of key research outcomes reported by the *Promising Practices* website (see http://www.promisingpractices.net/program.asp?programid=128). These data are summarized from two longitudinal studies conducted when the children were 19 years old [200] and at age 27. [201]

Scholastic Outcomes

- Program participants scored significantly higher on nonverbal intellectual performance tests at the end of their first preschool year (a group average score of 97.0 versus 72.0 for the control group) and second preschool year (89.8 versus 77.9). In subsequent years, the control population narrowed this gap; however, the program participant group continued to maintain a slight edge and the difference again achieved statistical significance at age 9, the final year of this type of testing, with the program group scoring 89.3 and the control group scoring 84.8.

- Program participants significantly outscored their control counterparts on vocabulary tests at the end of the first preschool year (a group average score of 74.5 versus 63.6 for the control group) and the second preschool year (81.0 versus 62.9). The program group maintained a slight edge in subsequent years; however, the difference was not significant.

- At age 19, a significantly higher percentage of program students (38 percent versus 21 percent of control students) were receiving postsecondary academic or vocational training.

- Program participants' high school grade-point averages were significantly higher than those of the control group (2.08 versus 1.71), and control students received nearly twice as many failing grades per year as did their program counterparts.

- Perry participants spent a significantly lower percentage of all their years of education in special education (16 percent for program participants versus 26 percent for control students), and participation in the program reduced the likelihood of being classified as mentally retarded by more than half.

- Perry participants spent a significantly higher percentage of all their years of education receiving remedial services (such as speech/language services) other than special education services (8 percent for program participants versus 3 percent for the control population).

- Program participants at age 14 significantly outscored their control counterparts in the total score and all subtests of the California Achievement Tests. The effect size for each of the score differences was moderate to large.

- Program students gave a positive response more frequently than did control students on 14 of 16 items measuring the student's attitudes toward high school.

- On the age-19 Adult Performance Level (APL) Survey, the program group significantly outscored the control group in general literacy (which indicates total score), occupational knowledge, health information, and reading skills. On the age-27 APL survey the program group significantly outscored the control group in health information and problem-solving but not general literacy. This is reflective of larger gains in general literacy on the part of the control population as compared with the program participant group.

- By age 27, the program group had completed a significantly higher level of schooling than had the control group (11.9 years for the program group versus 11.0 years for the control group), and had a sizably higher rate of high school graduation or its equivalent than did the control participants. Seventy-one percent of program participants versus 54 percent of control participants had earned a high school diploma or GED.

- The group differences in levels of schooling completed and high school graduation rates are primarily due to differences between females in the two groups. By age 27, as compared with control females, program females completed a significantly higher level of schooling (12.5 years versus 10.5 years) and had a significantly higher rate of regular high school graduation or its equivalent (84 percent versus 35 percent).

Socioeconomic Outcomes

- A significantly higher percentage of program students were working at the time of their age-19 follow-up interview (50 percent of program students versus 32 percent of control students).

- The control population had spent on average twice as many months without work since leaving school than had the program population.

- Program participants were nearly twice as likely to be economically self-sufficient and nearly half as likely to be receiving money from welfare at the time of the age-19 follow-up interview.

- At age 27, as a group, program participants had average monthly earnings of $1,219, versus $766 average monthly earnings among the control group. In addition, 29 percent of the program population versus 7 percent of the control population had monthly earnings in excess of $2,000.

- At age 27 there were no significant differences between the groups in terms of employment over the previous five years or in months of unemployment in the previous two years.

- At age 27, a significantly lower percentage of program males had received social services (such as welfare assistance services and public housing) in the previous ten years (52 percent of program males versus 77 percent of control males).

- Nearly three times as many program participants owned their own homes at age 27 (36 percent versus 13 percent of the control population).

Life- and Health-Risk Outcomes

- At age 19, as a group, the program population had a total of 47 property or violence arrests versus 74 such arrests among the control population.

- At age 19, program participants were half as likely to have been arrested for a non minor offense.

- At age 19, program participants were nearly half as likely to have been involved in a serious fight, caused someone an injury requiring medical attention, or have been in trouble with the police. The control population was more than twice as likely to have been involved in a group or gang fight.

- By age 27, as compared with the control group, the program participants averaged a significantly lower number of lifetime arrests (2.3 versus 4.6) and a significantly lower number of adult arrests (1.8 versus 4.0).

- By age 27, 7 percent of program participants versus 35 percent of control participants had been arrested five or more times in their lifetimes. This difference is primarily due to differences between males in the two groups. Among males only, 12 percent of program males versus 49 percent of control males had been arrested five or more times in their lifetimes.

Clearly, this early intervention has had a powerful effect on school readiness, academic achievement and scholastic outcomes; with lasting influences to their socioeconomic status and life/health risk circumstances. This program was included in this scan because of its focus on promoting social/emotional health and development.

The final proven program that includes parental involvement, education and comprehensive services is also the newest, *Early Head Start* (EHS). From a health perspective, this program is also the most comprehensive as its services include: child development services delivered in home visits (pre-natal care), child care, comprehensive health and mental health services, parenting education, nutrition education, health care and referrals, and family support. This community-based prevention program targets low-income pregnant women and families with infants and toddlers up to age 3 and have served 61,500 children (2003 statistics) in 708 communities. Families can receive one of three program options: 1) center-based, 2) home-based, and 3) combination programs (in which families receive both home visits and center experiences).

In a national randomized control study (treatment group = 1,513 families, control group = 1,488 families), Love et al. [202] found that participation in EHS enhanced children's cognitive and language development as well as their social-emotional learning and behavior by age 3. Non-significant results were found for child-parent engagement and for a child's emotional regulation or orientation/engagement as indicated by ratings of trained observers on the Bayley Behavior Rating Scale. Roggman et al. [203] found that changes in cognitive skills over time were different for those in EHS than for those in the comparison group. EHS children maintained stable test scores at 14, 24, and

36 months, whereas the comparison group children exhibited statistically significant decreases in their standardized cognitive skill scores between the initial and final measurement points.

As a preventative measure, the interventions identified were all shown to positively influence at-risk children and their families. All of these programs took a holistic view of the child and supported their physical and/or social-emotional health as well as providing support for their families. Providing medical, social and developmental assessment, treatment and referrals was one of the main recommendations for improving school readiness, according to a review of 40 child development research initiatives that involved a health component. [204] These authors found that comprehensive early childhood education programs that had a health surveillance component resulted in children with improved health and dental status, fewer emergency visits, improved behavioural skills, increased cognitive and social skills, improved maternal education and fewer incidents of juvenile delinquency, special educational placement and grade retention.

Early Childhood Social-Emotional Interventions

The three interventions presented in this category are all preventive strategies for enhancing pre-kindergartener's social-emotional development. As the *National Institute for Early Education Research* concludes "A child's ability to learn and to function as a contributing member of society rests heavily on the development of social competency and emotional health that begins at birth and is greatly influenced during the preschool years" [205] (p. 15). As well, there is ample evidence of the relationship between social-emotional development and school readiness. [206, 207, 208] According to the Collaborative for Academic, Social, and Emotional Learning (CASEL), "Social-emotional learning (SEL) is the process of acquiring the skills to recognize and manage emotions, develop caring and concern for others, make responsible decisions, establish positive relationships, and handle challenging situations effectively and ethically" (see http://www.casel.org/basics/definition.php).

Research has shown that SEL is not only fundamental to children's social and emotional development but also their health, ethical development, citizenship, academic learning, and motivation to achieve. For example, Guerra and Bradshaw [209] found that SEL increases a student's positive sense of self, self control, decision-making skills, moral system of belief, and prosocial connectedness. Emotional disturbances such as anxiety, if not addressed, can result in poor social and coping skills, reduced social interactions, low self-esteem and lower academic achievement. [210, 211]

The Primary Project is a targeted mental health intervention for children (aged 4-9 years) who have been screened and found to have early school adjustment difficulties such as mild aggression, withdrawal and learning difficulties. A series of one-on-one sessions are then provided for 30-40 minutes for up to 14 weeks. The curriculum consists of developmentally appropriate child-led play and relationship techniques to learn increased task orientation,

behavior control, assertiveness, and peer social skills. Evaluations of the program [212, 213, 214] have indicated its effectiveness for improving:

- Task orientation (e.g., learning difficulty, tolerance for frustration, willingness to follow school rules, and disruptive behavior);

- Behavior control incorporated such factors as aggression, tolerance for frustration, willingness to follow school rules, and disruptive behavior;

- Peer sociability, and;

- Adaptive assertiveness in social situations (including sharing opinions) and in comparison with shyness and anxiety.

Another preventative school-based intervention focused on social-emotional development is the _Promoting Alternative THinking Strategies_ (PATHS). The PATHS Preschool-grade 6 curriculum provides 30-45 lessons per year designed to promote social and emotional competence, prevent violence, aggression, and other behavior problems, improve critical thinking skills, enhance the classroom climate, promote emotional and social competencies and to reduce aggression and behavior problems among elementary school-aged children. It is a universal program provided by educators and counsellors with information and activities available for parents. Indicators of success include children not: engaging in violent behavior, displaying serious conduct problems, experiencing anxiety or mood disorders, such as depression. Although many studies have confirmed the effectiveness of the PATHS intervention for elementary students, [215, 216, 217] recent research has evaluated the curriculum with preschool students. Domitrovich, Cortes, and Greenberg [218] in their randomized experimental study found that the intervention showed a significant effect on children's: receptive emotion vocabulary, identification of feelings, anger attribution bias, anxiety and social withdrawal. Further, compared to children in the comparison group, those who had the PATHS intervention were rated by their teachers as more cooperative, emotionally aware and interpersonally skilled and by their parents as more socially and emotionally competent.

The final proven social-emotional intervention is also an early childhood prevention program, _Al's Pals: Kids Making Healthy Choice (_Al's Pals). This universal program, designed for children ages 3 to 8, seeks to promote social emotional competence and to decrease the risk factors of early and persistent aggression or antisocial behaviors. Specifically, it is designed to help children gain the skills to express feelings appropriately, relate to others, accept differences, use self-control, resolve conflicts peacefully, cope, and make safe and healthy choices. As well, the curriculum includes a parent education component to promote positive relationships between parents and children and provide ways to reinforce Al's Pals concepts at home. Evaluations of the program have shown its efficacy for increasing social competence (social independence, social interaction) and prosocial behaviors and decreasing antisocial/aggressive behaviors as reported by their teachers. [219, 220]

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Promising Practices

Over the past decade, early childhood programming and services have become more comprehensive and community-based, due in part to a focus on *how* past programs were effective (process research) and an understanding of the many community influences impacting children. Three main areas for promoting early childhood school readiness were identified as promising practices or future trends. These include integrated early childhood service models, a focus on practices that support transitions and the promotion of community/environmental supports entitled *The Child Friendly Cities/Communities Movement*.

Integrated Early Childhood Service Models

The new wave of delivery models for enhancing early child well-being and school readiness share many similar characteristics. They are comprehensive in nature; addressing the whole child's needs such as physical, mental and dental health, nutrition, developmental screening, and early intervention. They include the opportunity for early childcare and education as well as family education and supports services. Based in the community, these centres or hubs are often more accessible to the people they serve and tailored to the specific needs of a community. Finally, these programs have many different groups working together and have developed networks to support the child and family. Three examples are provided and come from Canada, Britain and the United States.

In Canada, *Toronto First Duty* (TFD) was a demonstration project, which typifies an effective early childhood service integration model. TFD was initiated based on the recommendation from the *Early Years Study*, [221] that existing community services for children and families be consolidated in order to provide an early learning, care, and parenting program for every young child in Ontario. The model has now been adopted as the official operational standard and prototype for early childhood services in Toronto (entitled *Toronto Best Start*). The goal of Toronto First Duty was to develop a universally accessible service that promotes the healthy development of children from conception through primary school, while at the same time, facilitating parents' work or study and offering support in their parenting role. Key components of TFD include: regulated child care, kindergarten and family support services that are consolidated into a single, accessible program, located in primary schools and coordinated with early intervention, social and family health services. In this delivery model, a professional team of kindergarten teachers, early childhood educators, family support staff and teaching assistants plan and deliver the program. Each of the five demonstration sites provided a platform for more specialized services including early intervention/identification and family health. Public health and other professionals delivered programs in the schools. Where indicated, families were linked to specialized services through the TFD sites. For each family, there was a single intake procedure and flexible enrolment options.

Preliminary data examining the impact of the program on children's school readiness found significant differences for language development (vocabulary), print awareness and comprehension, number knowledge and all five domains of the Early Development Instrument (physical, language, social, emotional, communication) across 2 years. [222] Replication with a larger sample of children is recommended to confirm these results.

In Britain, an early childhood integrated service delivery program called *Sure Start* has become their national model. According to their website (see http://www.surestart.gov.uk/surestartservices/settings/introduction/), Sure Start (SSLP) brings together childcare, early education, health and family support services for families with children under 5 years old. It is the cornerstone of the Government's drive to tackle child poverty and social exclusion by working with parents-to-be, parents/carers and children to promote the physical, intellectual and social development of babies and young children so that they can flourish at home and when they get to school. *Sure Start* brings together service providers – health, social services and early education, voluntary, private and community organizations and parents, to provide integrated services for young children and their families based on what local children need and parents want. A core set of services are provided at each site and include: home visiting, family supports, learning and childcare facilities, primary and community health, advice about child and family heath, support for people with special needs and good quality play opportunities.

A national evaluation of the program used a quasi-experimental, cross-sectional design that interviewed mothers (SSLP=12,575; comparison=1101) and conducted cognitive assessments on 3 year olds. After controlling for pre-existing family and areas characteristics, the study found positive impacts for both children and their families. Three-year-old SSLP children exhibited better social development (prosocial skills, independence and self-regulation). Their families also exhibited less negative parenting styles, had a better home learning environment and were more likely to use community services designed to support child development. [223] For a small sub-sample, there was a negative effect of the program. Families who had teen-aged mothers (14%) were more likely to have children with lower behavioral, social and verbal scores. Lower verbal scores were also found for lone parent families (33%) and those not employed (38%). Interestingly, programs, which were led by health services, were more effective and showed better outcomes (greater father involvement, less child accidents, higher ratings of programs by parents). [224]

The final program presented, *Smart Start,* is also a comprehensive, universal program that includes childcare and education, health care and information, and family support and education. Like the previous two programs, additional programming reflects local needs, goals and plans. This community-based initiative is available to all children in North Carolina, U.S. (although efforts are made to reach children from low SES backgrounds in particular). All sites have the goal of providing quality early childhood education and center-based care.

Evaluations of the program have focused on school readiness using the Kindergarten Teacher Checklist (KTC), which asks teachers to rate the child's cognitive, language, social, and motor skills on a scale of 1 to 5, with a higher score indicating greater skill. Outcome analysis compared Smart Start children to those who had attended some type of other childcare prior to kindergarten entry, and to those who had no previous childcare experience. Compared to children who had not received any previous childcare, children who had attended Smart Start scored significantly higher on the KTC, indicating an increased readiness for kindergarten. When compared against children who had attended other childcare centres (not Smart Start), children from low-income families scored higher on the school readiness scale; however this effect was not seen for children of higher SES families. [225, 226] Recent research has shown that children who are attending Smart Start centres to do better on measures of cognitive, language and social skills, regardless of family or cultural background. [227]

Supporting Transitions from Preschool to Kindergarten

Another community-based effort, which is being explored as a method for enhancing school readiness, is the provision of transitional services from kindergarten to grade 1. Transitions are defined by Kraft-Sayre and Pianta as a shared and dynamic process between children, family, teachers, and community as a child moves from preschool to kindergarten. [228] As Bohan-Baker and Little [229] conclude in their review of the current research and promising practices for involving families in the transition to kindergarten:

> A body of evidence is building that underscores the importance of creating transitional mechanisms and practices in order to sustain and build on children's social, emotional, and academic competencies. Early intervention cannot be viewed as an "inoculation" that ensures continued school success (Ramey & Ramey, 1999). As Ramey and Ramey's findings from the Abecedarian Project indicate, children who received additional environmental support as they moved into and through kindergarten and the early elementary grades performed better in reading and math (p. 2).

Further, these authors consider transitional practices as important mediators to sustaining early intervention gains in children's social, emotional, and academic competencies that were acquired in preschool programs and provide the following recommendations (see Table 12):

TABLE 12. SUMMARY OF PROMISING PRACTICES TO INVOLVE FAMILIES IN TRANSITIONS TO KINDERGARTEN

Transition Practices

- Contact with preschool families
- Contact with preschool children
- Kindergarten visits
- Home learning activities
- Informational meetings
- Partner with local PTAs
- Information dissemination
- Home visits
- Parent support groups
- Maintain informal contact with preschool "graduates"
- Facilitate early registration
- Staff ECE and kindergarten with bilingual teacher aides as needed

Core Partners

- School personnel (teachers, principals, superintendents)
- Parents and children
- Preschools/Head Start personnel
- Community groups

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Source: Bohan-Baker, M., & Little, P. M. D. (2002). The transition to kindergarten: A review of current research and promising practices to involve families. Cambridge, MA: Harvard Family Research Project. Available at www.gse.harvard.edu/hfrp/projects/fine/resources/research/bohan.html.

Although research is ongoing on the effectiveness of school transitional practices on school readiness, focus groups conducted with teachers, principals and parents confirms its value. [230] _Child Trends,_ [231] a nonprofit, nonpartisan research center dedicated to child development, further recommends: 1) contact between kindergartens and preschools so that kindergarten teachers can plan for individual students and so that children know what to expect during the transition; 2) contact between schools and homes, before and after entry into school, so that parents can be actively involved in their children's education; and, 3) connections between schools and community resources so that children can receive services they need as soon as possible.

Promoting Child Friendly Cities and Communities

The effects of the physical and social environment on children's well-being cover many areas and apply to health policy, environmental health, health promotion and prevention. The last decade has seen a world-wide movement to research, build and evaluate environments that support child health and well-being. [232] Entitled the _Child Friendly Cities Movement,_ it was launched in 1996 based on a resolution passed during the second United Nation's Conference on Human Settlements (see www.unhabit.org) to make cities liveable places for all, particularly children. A Child Friendly City has been defined as

"a local system of good governance committed to fulfilling children's rights, specifically:

- Influence decisions about their city
- Express their opinion on the city they want
- Participate in family, community and social life
- Receive basic services such as health care and education
- Drink safe water and have access to proper sanitation
- Be protected from exploitation, violence and abuse
- Walk safely in the streets on their own
- Meet friends and play
- Have green spaces for plants and animals
- Live in an unpolluted environment
- Participate in cultural and social events
- Be an equal citizen of their city with access to every service, regardless of ethnic origin, religion, income, gender or disability" [233]

Three defining features intrinsic to this movement and associated research are: 1) a focus on positive environmental features; 2) consideration of sociocultural differences of children in the natural and built environment; [234] and, 3) that children and youth are involved in planning and decision-making in compliance with the United Nation's Convention on the Rights of the Child (1989).

Environmental Child-friendliness (ECE) is the term given by leading researchers studying child-environment congruence. [235, 236, 237, 238, 239] According to Horelli [240]

> Environmental child-friendliness is a community product developed from local structures beyond the individual level. It comprises a network of places with meaningful activities, where young and old can experience a sense of belonging whether individually or collectively. The participation of children and youth in the shaping of their settings plays a central role in the creation of child friendly environments (p. 225).

In a study looking at the environmental impacts on children's health and well-being, Pivik, [241] explored child-environment congruence from the perspective of children and youth. Using a multi-method design that included interviews, cognitive mapping, asset mapping, and group discussions, 82 children and youth aged 4-15 years living on a coastal island identified important features of the environment from their perspective. The data was divided by epoch groups and included young (aged 4-8), middle (aged 9-11) and older (aged 12-15) children. Three broad categories emerged as important for nurturing environments across all groups. These included the physical environment, the social environment and available resources. Specifically, positive benefits of the community for all of children/youth included: a high sense of safety, the positive influence of the natural environment, a close-knit community and available resources, programs and services.

The majority of responses by the younger and middle groups reported some aspect of the physical environment as a positive element of their community. The younger children reported the importance of: lots of nature, lots of

trees, can play on street, can fly kites, and can go fishing. Children in the middle group also focused on how the physical environment assisted in play, such as: lots of places and spaces to play; swimming at the beach, safe to play on the road, great biking trails, nice and quiet and lots of trees. The older group felt the community was good for kids because it provided the chance to see lots of wild animals, had wide open spaces, where nature was very calming and there was no pollution.

A sense of safety was another major theme of a good community, often combining aspects of both the physical and social environment. All groups but particularly the older youth highlighted the importance of the social environment. Overall, this community was identified as good for kids because people are nice and friendly, they look out for each other and due to the small size of the community, most people are familiar. Finally, in the category of resources, the younger children felt that the island had good schools, fun things to do, a toy store and for some, swimming in at a private neighbourhood pool. The middle and older children mentioned the schools, nature trails, the youth centre and arts and recreational programs.

Negative elements of the environment included: 1) the lower level of resources, particularly for youth; 2) the impact of commuting by ferry; and 3) concern about substance abuse. All children reported wanting more recreational opportunities such as a public swimming pool, a recreational centre, and more organized sports. The younger and middle groups also wanted more play structures and parks. Older youth wanted more and different programs, as well as places to gather as a group, play music or do pick-up sports. As well, the older youth wanted a high school on island, a hospital or medical clinic and more shops directed at their age group.

These results are consistent with other research examining environmental child friendliness, which also used child and youth reports. For example, Haikkola, Pacilli, Horelli and Preeza [242] asked children, their parents, the elderly and professionals about those features that were positive for children in two different urban neighbourhoods (Helsinki and Rome). The most important features of the Finish neighbourhood, according to its children, were recreational services, public areas, the social environment and a sense of safety. These 12 year olds either preferred resources that promoted recreation (playgrounds, sports facilities, youth centre) or the social environment (familiarity, social security, friendliness). Negative features of the environment related to a sense of safety in one area (junkies, alcoholics) which effectively limited their autonomy. Ideal environments from these children's perspective would include a swimming place (pool or lake) and an amusement centre. Children from Rome (11-12 years) indicated that services (e.g., stores, game center, school) were important to them and also indicated the importance of green spaces (e.g., providing clean air, doing group sports, socializing with friends). Two other factors were identified as important: proximity- ease of reaching a specific place; and spaciousness-the largeness of spaces.

Negative elements included traffic; urban decay (garbage, pollution) and boredom (lack of things to do). Ideal environments would include recreational opportunities/services, less pollution, green spaces to play, less crowding and opportunities for greater independence such as using streets for bicycles only. The over-riding features of both neighbourhoods from the children's perspective were the need for settings which allowed for safe play and social interactions with peers.

Lynch, [243] Chawla, [244] and Horelli [245] have also examined child-friendly environments from the perspective of children and found similarities across different cultures. Children value independent mobility, opportunities for action, places to meet friends, green areas, basic services, safety and continuity. Horelli [246] has developed a *Framework for Environmental Child Friendliness* that includes 10 normative dimensions complimented by both person-environment fit and collective environment fit criteria. Based on a content analysis of research on child involvement with their environments and studies exploring youth feedback, she identified the following dimensions as critical for good environments for children and youth (see Table 13):

TABLE 13. FRAMEWORK FOR ENVIRONMENTAL CHILD FRIENDLINESS- HORELLI (2007)
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1) Housing and dwellings that are flexible and secure;

2) The availability of basic services, e.g., health, education and transport, that facilitate everyday life;

3) Opportunities for children to participate in planning and development within their environments;

4) Feelings of physical and psychological safety and security;

5) Opportunities for close social relationships with family, kin, peers and community;

6) Environments which are functional, aesthetic and cultural that provide a variety of interesting affordances and arenas for activities;

7) Resource provision and distribution and poverty reduction;

8) Elements of nature and sustainable development;

9) A sense of belonging and continuity;

10) Good governance that includes and acts on youth decision-making about their environments.

Added to these dimensions are the need to ensure that the environment provides supports or perceived support for one's goals and needs [247,248,249] and community supports such as social networks [250] and supportive collective infrastructures. [251,252] Tied to all of these criteria are the need to ensure that children and youth are legitimately involved in the planning and evaluation of these environments in a culturally-sensitive manner.

Pivik, Herrington and Gummerum [253] have linked children's physical, social and emotional health and well-being to environmental features. Three studies are discussed which explored environmental features and child well-being, social-emotional development, physical development, a sense of safety, physical activity and varying levels of independence. Recommendations from these authors suggest adding the following dimensions when considering child friendly congruence:

- Environmental features that promote play/activity and reduce obesity

- Environmental features which provide stimulation and the opportunity for developmentally safe risk taking in order to develop competencies

- Play spaces that address different developmental needs and levels of independence

Conclusion

This environmental scan identified an important role for health professionals in promoting school readiness. Good physical, social-emotional and mental health are important considerations for children's well-being and readiness to learn. Healthy families and neighbourhoods also impact school readiness. Interventions that have been the most successful have addressed all of these influences on child well-being. This scan differed from other reviews in that a broad definition of child health was used (physical, developmental, mental, social-emotional), resulting in the inclusion of some interventions not normally associated with school readiness (e.g., social-emotional interventions). As well, situating school readiness within an ecological framework offers the opportunity to include the effects of the social and physical environment on children's well-being and relatedly, promising practices such as the promotion of child friendly cities. Health policies that support access to health screening and early intervention, early care and education, family education and support and safe and healthy communities will yield the most significant gains in promoting school readiness.

Appendix 1: Internet links for School Readiness and Health

Clearinghouses and databases

❖ Promising Practices Network
    The PPN site features summaries of programs and practices that are proven to improve outcomes for children. All programs have been screened for quality and to ensure that they have evidence of positive effects. As well, the site offers a searchable database, reports, resources and policy briefs of effective practices for children.
    C.A.R.T.
    The Compendium of Assessment and Research Tools (CART) is a database that provides information on instruments associated with youth development programs. CART includes descriptions of research instruments, tools, rubrics, and guides and is intended to assist those who have an interest in studying the effectiveness of service-learning, safe and drug-free schools and communities, and other school-based youth development activities.

❖ Child Trends
    Child Trends is a nonprofit, nonpartisan research center that studies children at all stages of development. Includes publications and the What Works Clearinghouse, a searchable database of evidence-based educational practices.

❖ NREPP: National Registry of Evidence-based Programs and Practices
    NREPP is a searchable database of interventions for the prevention and treatment of mental and substance use disorders. This site has been developed to help people, agencies, and organizations implement effective programs and practices in their communities.

❖ The Canadian Best Practices Portal for Health Promotion and Chronic Disease Prevention This portal helps develop and disseminate best practices information for chronic disease prevention and control interventions, provide decision makers with a comprehensive and standardized resource about best practices for chronic disease prevention and control, and to create awareness of the overall Canadian Best Practices System.

❖ CASEL
    The Collaborative for Social and Emotional Learning is a leading site for the promotion of social emotional development. The site includes a searchable database of effective practices, publications and resources.

❖ National Governor's Association Center for Best Practices
    The NGA Center for Best Practices' Education Division provides information on best practices in early childhood, elementary and secondary, and postsecondary education, including teacher quality, high school redesign, reading, access to and success in postsecondary education, extra learning opportunities, and school readiness.

❖ Evidence for Policy and Practice Information and Coordinating Center (EPPI-Centre)
    The Centre provides review of evidence-based policy and practice related to social interventions. The site provides systematic reviews, databases and an evidence library related to education and health promotion, among other public policy areas.

❖ Campbell Collaboration (C2)   The Campbell Collaboration disseminates systematic reviews of existing interventions related to social welfare, education and crime.

❖ OJJDP Model Programs Guide
    The Office of Juvenile Justice and Delinquency Prevention's Model Programs Guide (MPG) is a database of evidence-based programs that address issues such as substance abuse, mental health, and education programs.

Associations and institutions promoting school readiness

❖ UNESCO
UNESCO advocates for Early Childhood Care and Education (ECCE) programmes that attend to health, nutrition, security and learning and which provide for children's holistic development. ECCE is part of a range of programmes that promote inclusive education. Web page includes policy briefs, publications and country profiles.

❖ Centre for Excellence for Children's Wellbeing
Canadian site focusing on child development. Includes the Encyclopedia of Early Childhood Development, publications and bulletins related to early childhood development.

❖ Public Health Agency of Canada
The Chief Public Health Officer's Report on The State of Public Health in Canada (2008). Chapter 4 focuses on the social and economic factors that influence health in relation to child development. The agency also houses the Canadian best practices portal.

❖ Statistics Canada
Research paper on the readiness to learn at school among five-year-old children in Canada. The report used data from the National Longitudinal Survey of Children and Youth (NLSCY) to describe the readiness to learn at school of Canadian children who were 5 years old in 2002/2003.

❖ Canadian Institute of Child Health
CICH focuses on research, policy recommendations and community development related to child health in Canada, specifically: 1) monitoring our children's health; 2) educating professionals, caregivers and policy-makers; and 3) advocating for legislation and policies that improve child health.

❖ Canadian Policy Research Networks
Canadian social policy think tank provides publications on public policy issues in health care, supports to families, learning opportunities, job quality, and sustainable cities and communities.

❖ National Association for the Education of Young Children
The National Association for the Education of Young Children (NAEYC) is dedicated to improving the well-being of all young children, with particular focus on the quality of educational and developmental services for all children from birth through age 8. Site provides research publications, position papers and resources to support the education of young children.

❖ Early Childhood Research Collaborative
Research collaborative focused on early childhood development. Provides publications, resources and links.

❖ National Institute for Literacy
The Institute provides information to educators and families about teaching and learning the components of reading using findings from scientifically based research. Includes publications and information about teaching approaches.

❖ RAND Research Briefs
Research brief entitled "Early childhood interventions: Benefits, costs and savings". Site also has research briefs, publications, technical reports and databases covering many public fields including education.

❖ Canadian Task Force on Preventive Health Care
This site provides information on a wide variety of preventive health interventions, using the evidence-based recommendations of the Canadian Task Force on Preventive Health Care.

❖ Future of Children
The Future of Children is a collaboration of the Woodrow Wilson School of Public and International Affairs at Princeton University and the Brookings Institution. The mission of The Future of Children is to translate the best social science research about children and youth into information that is useful to policymakers, practitioners, grant-makers, advocates, the media, and students of public policy. The site offers publications, resources and policy briefs of research focused on children's well-being.

Early Intervention and Education

❖ Early Intervention Canada
   This site describes a 3 year project to study the effects of early intervention for children at risk or identified as having developmental delays.

❖ International Society on Early Intervention
   The site provides information on the effects of early intervention, publications and a list of international links of those focused on early intervention efforts for vulnerable children.

❖ National Scientific Council on the Developing Child
   National Scientific Council is a multi-disciplinary collaboration of scientists and scholars from universities across the United States and Canada designed to bring the science of early childhood and early brain development to bear on public policy decision-making. The mission of the Council is to synthesize and communicate science to help inform policies that promote successful learning, adaptive behavior, and sound physical and mental health for all young children. Includes publications and descriptions of current research initiatives.

❖ National Institute for Early Education Research
   The National Institute for Early Education Research (NIEER) conducts and communicates research to support high quality, effective, early childhood education for all young children. Site includes publications and current research initiatives.

❖ National Centre for Early Development and Learning
   NCEDL focuses on enhancing the cognitive, social, and emotional development of children from birth through age eight. Site provides links to research reports & publications for the national research and development centers of the Institute for Education Sciences (IES), USA.

❖ Family Village School
   A list of resources for special education and early interventions for children 0-3 years with disabilities or developmental delays.

❖ Toronto Best Start
   Example of an early learning and care program project that uses a community/neighbourhood hub delivery system which allows collaboration between the service providers and provides clustered service care.

Indicators and School Readiness Initiatives

❖ Offord Centre for Child Studies
   Associated with McMaster University, this site offers publications and information related to school readiness, the *Early Development Instrument* and The School Readiness to Learn Project.

❖ Human Early Learning Partnership
   Network of individuals interested in child development across six universities in B.C. Provides research reports, publications, and resources.

❖ Centre for Longitudinal Research
   Site describes international studies which follow large numbers of individuals from birth and throughout their lives, collecting information on education and employment, family and parenting, physical and mental health, and social attitudes.

❖ Getting Ready
   American School Readiness Initiative. Site describes the indicators used, publications and current research examining school readiness.

❖ The Pathways Mapping Initiative
   A collaboration between Harvard University and the Annie E. Casey Foundation, this site provides a map of indicators for school readiness and family economic success that contribute to child and youth outcomes.

❖ The Search Institute
Research-based list of developmental assets for early childhood. Site includes resources and research for community development supporting children and youth.

❖ National Children's Agenda (Canada)
Backgrounder on Canada's National Children's Agenda and measures used to track readiness to learn.

❖ Canadian Council on Learning
Provides references and resources on early childhood learning, in Canada and abroad. New document describing databases on early childhood development.

Environmental Influences

❖ American Academy of Pediatrics
Policy statement from the Committee on Environmental Health on the built environment and designing communities to promote physical activity in children.

❖ Children & Nature Network
Research, resources and publications addressing the connection between child development and exposure to the natural world.

❖ Child Friendly Cities/Communities
This site describes The Child Friendly City Initiative whose aim is to guide cities and other systems of local governance in the inclusion of children's rights as a key component of their goals, policies, programmes and structures. Tools, frameworks and research are provided to assist cities or communities in this effort.

❖ Active Living Research
Active Living Research, a national program of the Robert Wood Johnson Foundation, contributes to the prevention of childhood obesity in low-income and high-risk racial/ethnic communities by supporting research to examine how environments and policies influence active living for children and their families.

❖ Safe Routes to School
Site provides research and information for promoting safe passage of children walking and cycling in communities.

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Appendix 2: Inclusion Criteria for Databases and Clearinghouses

All of the information presented below comes directly from their websites.

1.   Promising Practices Network

From website: http://www.promisingpractices.net/criteria.asp

Evidence Levels:
Proven and Promising Programs
Programs are generally assigned either a "Proven" or a "Promising" rating, depending on whether they have met the evidence criteria below. In some cases a program may receive a Proven rating for one indicator and a Promising rating for a different indicator. In this case the evidence level assigned will be Proven/Promising, and the program summary will specify how the evidence levels were assigned by indicator.

Screened Programs

Some programs on the PPN site are identified as "Screened Programs." These are programs that have not undergone a full review by PPN, but evidence of their effectiveness has been reviewed by one or more credible organizations that apply similar evidence criteria. Screened Programs may be fully reviewed by PPN in the future and identified as Proven or Promising, but will be identified as Screened Programs in the interim.

Evidence Criteria

Type of Information	Proven Program	Promising Program	Not Listed on Site
	Program must meet all of these criteria to be listed as "Proven".	Program must meet at least all of these criteria to be listed as "Promising".	If a program meets any of these conditions, it will not be listed on the site.
Type of Outcomes Affected	Program must directly impact one of the indicators used on the site.	Program may impact an intermediary outcome for which there is evidence that it is associated with one of the PPN indicators.	Program impacts an outcome that is not related to children or their families, or for which there is little or no evidence that it is related to a PPN indicators (such as the number of applications for teaching positions).
Substantial Effect Size	At least one outcome is changed by 20%, 0.25 standard deviations, or more.	Change in outcome is more than 1%.	No outcome is changed more than 1%.
Statistical Significance	At least one outcome with a substantial effect size is statistically significant at	Outcome change is significant at the 10% level (marginally significant).	No outcome change is significant at less than the 10% level.

the 5% level.

Comparison Groups	Study design uses a convincing comparison group to identify program impacts, including randomized-control trial (experimental design) or some quasi-experimental designs.	Study has a comparison group, but it may exhibit some weaknesses, e.g., the groups lack comparability on pre-existing variables or the analysis does not employ appropriate statistical controls.	Study does not use a convincing comparison group. For example, the use of before and after comparisons for the treatment group only.
Sample Size	Sample size of evaluation exceeds 30 in both the treatment and comparison groups.	Sample size of evaluation exceeds 10 in both the treatment and comparison groups.	Sample size of evaluation includes less than 10 in the treatment or comparison group.
Availability of Program Evaluation Documentation	Publicly available.	Publicly available.	Distribution is restricted, for example only to the sponsor of the evaluation.

*Additional considerations play a role on a case-by-case basis. These may include attrition, quality of outcome measures, and others.

Currently, we do not require programs to do the following:

- Be currently implemented in some location and provide technical assistance or support.

- Have been replicated numerous times. (While we recognize the importance of program replication and fidelity to program success, we believe there is value to including information about programs that have successfully improved outcomes for children and families but have not been replicated.)

- Have articulated as program goals the outcomes they impact. (For example, if a program was designed to reduce violence, but met the criteria for a proven program because it reduced drug use, we would list the program as a "proven" program under the drug use reduction indicator, even though the program did not intend to reduce drug use.)

- Evaluation to have appeared in a peer-reviewed journal. Nor do we count as "proven" every evaluation that has been published in a peer-reviewed journal.

2. National Registry of Evidence-based Programs and Practices (NREPP)
Web site at http://nrepp.samhsa.gov. of the National Clearinghouse for Alcohol and Drug Information. Information from website.

Peer reviewed process using the following criteria:

NREPP's Quality of Research ratings are indicators of the strength of the evidence supporting the outcomes of the intervention. Higher scores indicate stronger, more compelling evidence. Each outcome is rated separately

because interventions may target multiple outcomes (e.g., alcohol use, marijuana use, behavior problems in school), and the evidence supporting the different outcomes may vary.

NREPP uses very specific standardized criteria to rate interventions and the evidence supporting their outcomes. All reviewers who conduct NREPP reviews are trained on these criteria and are required to use them to calculate their ratings.

Criteria for Rating Quality of Research

Each reviewer independently evaluates the Quality of Research for an intervention's reported results using the following six criteria:

1. Reliability of measures
2. Validity of measures
3. Intervention fidelity
4. Missing data and attrition
5. Potential confounding variables
6. Appropriateness of analysis

Reviewers use a scale of 0.0 to 4.0, with 4.0 being the highest rating given.

1. Reliability of Measures

Outcome measures should have acceptable reliability to be interpretable. "Acceptable" here means reliability at a level that is conventionally accepted by experts in the field.

0 = Absence of evidence of reliability or evidence that some relevant types of reliability (e.g., test-retest, interrater, interitem) did not reach acceptable levels.

2 = All relevant types of reliability have been documented to be at acceptable levels in studies by the applicant.

4 = All relevant types of reliability have been documented to be at acceptable levels in studies by independent investigators.

2. Validity of Measures

Outcome measures should have acceptable validity to be interpretable. "Acceptable" here means validity at a level that is conventionally accepted by experts in the field.

0 = Absence of evidence of measure validity, or some evidence that the measure is not valid.

2 = Measure has face validity; absence of evidence that measure is not valid.

4 = Measure has one or more acceptable forms of criterion-related validity (correlation with appropriate, validated measures or objective criteria); OR, for objective measures of response, there are procedural checks to confirm data validity; absence of evidence that measure is not valid.

3. Intervention Fidelity

The "experimental" intervention implemented in a study should have fidelity to the intervention proposed by the applicant. Instruments that have tested acceptable psychometric properties (e.g., inter-rater reliability, validity as shown by positive association with outcomes) provide the highest level of evidence.

0 = Absence of evidence or only narrative evidence that the applicant or provider believes the intervention was implemented with acceptable fidelity.

2 = There is evidence of acceptable fidelity in the form of judgment(s) by experts, systematic collection of data (e.g., dosage, time spent in training, adherence to guidelines or a manual), or a fidelity measure with unspecified or unknown psychometric properties.

4 = There is evidence of acceptable fidelity from a tested fidelity instrument shown to have reliability and validity.

4. Missing Data and Attrition

Study results can be biased by participant attrition and other forms of missing data. Statistical methods as supported by theory and research can be employed to control for missing data and attrition that would bias results, but studies with no attrition or missing data needing adjustment provide the strongest evidence that results are not biased.

0 = Missing data and attrition were taken into account inadequately, OR there was too much to control for bias.

2 = Missing data and attrition were taken into account by simple estimates of data and observations, or by demonstrations of similarity between remaining participants and those lost to attrition.

4 = Missing data and attrition were taken into account by more sophisticated methods that model missing data, observations, or participants, OR there were no attrition or missing data needing adjustment.

5. Potential Confounding Variables

Often variables other than the intervention may account for the reported outcomes. The degree to which confounds are accounted for affects the strength of causal inference.

0 = Confounding variables or factors were as likely to account for the outcome(s) reported as were the hypothesized causes.

2 = One or more potential confounding variables or factors were not completely addressed, but the intervention appears more likely than these confounding factors to account for the outcome(s) reported.

4 = All known potential confounding variables appear to have been completely addressed in order to allow causal inference between the intervention and outcome(s) reported.

6. Appropriateness of Analysis

Appropriate analysis is necessary to make an inference that an intervention caused reported outcomes.

0 = Analyses were not appropriate for inferring relationships between intervention and outcome, OR sample size was inadequate.

2 = Some analyses may not have been appropriate for inferring relationships between intervention and outcome, OR sample size may have been inadequate.

4 = Analyses were appropriate for inferring relationships between intervention and outcome. Sample size and power were adequate.

3. The Office of Juvenile Justice and Delinquency Prevention's Model Programs Guide (OJJDP).
See http://www.dsgonline.com/mpg2.5//mpg_index.htm

Description from website: http://www2.dsgonline.com/mpg/ratings.aspx

Ratings
The MPG evidence ratings are based on the evaluation literature of specific prevention and intervention programs. The overall rating is derived from four summary dimensions of program effectiveness: 1) The conceptual framework of the program; 2) The program fidelity; 3) The evaluation design

The empirical evidence demonstrating the prevention or reduction of problem behavior; the reduction of risk factors related to problem behavior; or the enhancement of protective factors related to problem behavior

The effectiveness dimensions as well as the overall scores are used to classify programs into three categories that are designed to provide the user with a summary knowledge base of the research supporting a particular program. A brief description of the rating criteria is provided below.

Exemplary
In general, when implemented with a high degree of fidelity these programs demonstrate robust empirical findings using a reputable conceptual framework and an evaluation design of the highest quality (experimental).

Effective
In general, when implemented with sufficient fidelity these programs demonstrate adequate empirical findings using a sound conceptual framework and an evaluation design of the high quality (quasi-experimental).

Promising
In general, when implemented with minimal fidelity these programs demonstrate promising (perhaps inconsistent) empirical findings using a reasonable conceptual framework and a limited evaluation design (single group pre- post-test) that requires causal confirmation using more appropriate experimental techniques.

4. Coalition for Evidence-Based Policy: Social Programs that Work
See http://www.evidencebasedprograms.org

Description from website: http://www.evidencebasedprograms.org/

Criteria: Must be randomized controlled trials (RCTs) that:

1. Are well-designed and implemented; and
2. Have significant policy implications-- because they show, for example, that (a) a social intervention has an important effect on life outcomes and, preferably, can be readily replicated at modest cost; or (b) a widely-used intervention has little or no effect.

To determine whether an RCT is well-designed and implemented, we use the criteria in the U.S. Office of Management and Budget (OMB) document What Constitutes Strong Evidence of a Program's Effectiveness

Regarding the overall study design:

- Adequate sample size -- one large enough to detect meaningful effects of the intervention.
- Random assignment conducted at the appropriate level -- either groups (e.g., classrooms, housing projects), or individuals (e.g., students, housing tenants), or both.
- Preferably, evaluation of the intervention in the real-world community settings and conditions where it would normally be implemented.

Regarding whether the intervention and control groups remained equivalent during the study:

- Few or no systematic differences between the intervention and control groups prior to the intervention (e.g., in age, sex, income, education).

- Few or no control group members who participated in the intervention, or otherwise benefited from it (i.e., there is minimal "cross-over" or "contamination" of controls).
- Outcome data collected in the same way, and at the same time, from the intervention and control groups.
- Outcome data obtained for a high proportion of sample members originally randomized (i.e., there is low sample "attrition").
- Sample members retained in the original group to which they were randomly assigned, when analyzing study outcomes (i.e., an "intention-to-treat" analysis). This is done even for intervention group members who fail to participate in or complete the intervention.
- If needed, "placebo" treatment for the control group (i.e., an ineffectual but harmless treatment, to ensure all sample members believe they are receiving treatment).

Regarding the study's outcome measures: "Valid" outcome measures (i.e., measures that are highly correlated with the true outcomes that the intervention seeks to affect) -- preferably well-established tests and/or objective, real-world measures (e.g., arrest rates for a crime intervention).

- Outcome measures that are of policy or practical importance (e.g., for a pregnancy prevention program, actual pregnancies or unprotected sex, not just attitudes toward sex).
- Where appropriate, "blinding" of the study team members who collected outcome data (i.e., they are kept unaware of who is in the intervention versus control group).
- Preferably long-term follow-up (e.g., a year after the intervention ended, preferably longer).

Regarding the study's reporting of the intervention's effects: Reporting of the intervention's effects on all outcomes that the study measured, not just those for which there are positive effects.

- For each claim of a positive effect, a reporting of (i) the size of the effect, and whether it is of policy or practical importance; and (ii) tests showing that the effect is statistically significant (i.e., unlikely to be due to chance). These tests should take into account key features of the study design, such as whether individuals or groups were randomized.
- If possible, corroboration of reported effects in more than one implementation site and/or population.

Each of our study summaries includes a short section -- "Discussion of Study Quality" -- detailing how the study measures up to the above criteria, including any flaws or limitations.

How this site relates to other "what works" sites: Our site focuses on the few studies across the spectrum of social policy that meet the top-level criteria above. We estimate that only 40-50 such studies exist. The site thereby seeks to complement the excellent existing "what works" sites that provide in-depth coverage of specific policy areas, or systematic evidence reviews. Our site links to such sites.

How we seek to ensure, for each intervention on our site, that we've identified all well-designed RCTs:
For each intervention we summarize, we--

1. Do a comprehensive search of the academic literature and world wide web for such RCTs (using PsycINFO, ProQuest, PubMed, ERIC, C2-SPECTR, Google, Social SciSearch, Dissertation Abstracts, Wilson Social Sciences Abstracts, and similar resources); and
2. Specifically ask researchers and practitioners with expertise in the relevant literature if they know of any such RCTs that we are missing.

Through this process, we seek to identify all well-designed RCTs on the intervention, including those showing null effects that might not otherwise have come to our attention.

5. Child Trends, What Works Database. See http://www.childtrendsdatabank.org/WhatWorks.cfm

What Works Clearinghouse (WWC; see http://ies.ed.gov/ncee/wwc/), an initiative of the U.S. Department of Education's Institute of Education Sciences. Amongst other topics, The WWC evaluates beginning reading interventions and instructional strategies for students in grades K-3. The WWC reviews each study that passes eligibility screens to determine whether the study provides strong evidence (_Meets Evidence Standards_), weaker evidence (_Meets Evidence Standards with Reservations_), or insufficient evidence (_Does Not Meet Evidence Standards_) for an intervention's effectiveness. Currently, only well-designed and well-implemented randomized controlled trials (RCTs) and regression discontinuity studies that provide the strongest evidence of causal validity are considered _Meeting Evidence Standard._ Those studies which _Meets Evidence Standards with Reservations_ include all quasi-experimental studies with no design flaws and randomized controlled trials that have problems with randomization, attrition, or disruption. Studies that do not provide strong evidence of causal validity are identified as _Not Meeting Evidence Screens._

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Appendix 3: Description of Interventions

PROVEN

Developmental Assessment and Access to Early Interventions

Newborn Individualized Developmental Care and Assessment Program (NIDCAP)

See http://www.nidcap.org

Support: Promising Practices Network (Proven); Rand Corporation (2005).

The NIDCAP focuses on the needs of infants in neonatal intensive care units (NICUs). It is a relationship-based and family-centered program that relies on neurobehavioral observation to develop an in-depth behavioral developmental profile of preterm low-birthweight infants. NIDCAP encourages parents and other key family members to be constantly present in the NICU and to take charge of the development and nurturing of their infants. An individualized plan is developed for each child based on a structured method of observing and assessing infant behavior. One of the goals of the plan is to reduce sensory overload (high noise levels, constant lighting, frequent medical interventions, and regular handling. As well, biweekly home visits are provided to families post-release from the NICU, up until the child reaches age 2. Comprehensive training is also provided to developmental specialists, **nurse educators**, a multidisciplinary leadership support team, **nursing staff**, and a parent council. Eleven NIDCAP training centers, including ten across the U.S. and one in Europe, provide consultation and training for successful delivery of the program.

The Infant Health and Development Program (IHDP)

See: http://www.promisingpractices.net/program.asp?programid=136
Support: Promising Practices Network (Proven/Promising); Rand Corporation (2005).

IHDP is a comprehensive early childhood intervention for low birth weight (less than or equal to 2,500 grams or about 5.5 pounds), and premature (less than or equal to 37 weeks) infants designed to reduce the infants' health and developmental problems. It combined early child development and family support services with **paediatric follow-up**. The program was initiated upon infants' discharge from the neonatal nursery and continued until 36 months of age (child age was corrected for prematurity). The intervention services, provided free to participating families, consist of three components: home visits, child attendance at a child development center, and parent group meetings. Infants participated in **paediatric follow-up, which was comprised of medical, developmental, and social assessments, with referral for paediatric care and other services as indicated**. Home Visits: The IHDP protocol specified weekly home visits for the first year, and biweekly visits thereafter. The home visitor provided parents with health and developmental information, along with family support. In addition, the home visitor implemented two specific curricula, the first of which emphasized cognitive, linguistic, and social development through games and activities for the parent to use with the child, while the second involved a systematic approach to help parents manage self-identified problems. Child Development Centers: Beginning at 12 months and continuing until 36 months, the IHDP intervention children attended a Child Development Center (see above) five days a week for at least four hours a day. The teaching staff continued to implement the curriculum learning activities used by the home visitors and tailored the program to each child's needs and developmental levels. As well, bimonthly parent group meetings provided parents with information on child rearing, health and safety, and other parenting concerns, along with some degree of social support.

For additional information on screening and surveillance, see http://www.dbpeds.org/learning/

The Healthy Steps Approach
See www.healthysteps.org
Source: http://www.dbpeds.org/articles/detail.cfm?TextID=508

Support: Developmental Pediatrics on-line/ American Academy of Pediatrics Section on Developmental and Behavioral Pediatrics; 6 randomized control studies

Focusing on children from birth to age three, Healthy Steps uses a team approach to **primary health care** for young children. A professional staff member, called a Healthy Steps Specialist, whose background in child development, nursing, or social work is complemented by Healthy Steps training, is the member of the health care team who provides an effective link between the family and the pediatric and family practice. Healthy Steps offers practices the flexibility to customize the following services to best serve their families:

- Home visits offered at birth and at key developmental stages

- Well-child visits with a clinician and Healthy Steps Specialist

- A dedicated parent telephone information line

- Child development and family health check-ups

- English- and Spanish-language written materials on topics such as toilet training, discipline, and nutrition

- Age-appropriate books for mothers and fathers to read to their children

- Parent support groups

- Referrals for children (e.g., speech or hearing specialists) and parents (e.g., maternal depression counselling)

Reach Out and Read

See http://www.reachoutandread.org

Support: Rand Corporation (2005)

Reach Out and Read is a national program that promotes reading aloud to young at-risk children by using the **paediatric office as a site for education and intervention**. Doctors and nurses give new books to children at each well-child visit from 6 months of age to 5 years and accompany these books with developmentally appropriate advice to parents about reading aloud with their child. First implemented in 1989, Reach Out and Read is available in all 50 US states, the District of Columbia, Puerto Rico, and Guam.

Trauma-Focused Cognitive Behavioral Therapy (TF-CBT)

Description from: http://nrepp.samhsa.gov/programfulldetails.asp?PROGRAM_ID=217

Supported by: National Registry of Evidence-based Programs and Practices (NREPP), a service of the Substance Abuse and Mental Health Services Administration (SAMHSA), Office of Juvenile Justice and Delinquency Prevention's Model Programs Guide (exemplary)

Trauma-Focused Cognitive Behavioral Therapy (TF-CBT) is a psychosocial treatment model designed to **treat posttraumatic stress and related emotional and behavioral problems** in children and adolescents. Initially

developed to address the psychological trauma associated with child sexual abuse, the model has been adapted for use with children who have a wide array of traumatic experiences, including domestic violence, traumatic loss, and the often multiple psychological traumas experienced by children prior to foster care placement. The treatment model is designed to be delivered by trained therapists who initially provide parallel individual sessions with children and their parents (or guardians), with conjoint parent-child sessions increasingly incorporated over the course of treatment. The acronym PRACTICE reflects the components of the treatment model: Psychoeducation and parenting skills, Relaxation skills, Affect expression and regulation skills, Cognitive coping skills and processing, Trauma narrative, In vivo exposure (when needed), Conjoint parent-child sessions, and Enhancing safety and future development. Although TF-CBT is generally delivered in 12-16 sessions of individual and parent-child therapy, it also may be provided in the context of a longer-term treatment process or in a group therapy format.

Family Support Services

Nurse Family Partnership (NFP)

Adapted description from *Promising Practices Network*. See http://www.promisingpractices.net/program.asp?programid=16 Ref: www.nursefamilypartnership.org

Support: Promising Practices Network; Rand Corporation, NREPP, OJJDP, CEBP

The Nurse Family Partnership Program provides family support and parent education for young children in their homes. The Nurse Family Partnership program (previously named the Prenatal and Infancy Nurse Home Visitation Program) provides home visits by registered nurses to first-time mothers, beginning during pregnancy and continuing through the child's second birthday. The program has three primary goals: (1) to **improve pregnancy outcomes by promoting health-related behaviors; (2) to improve child health, development and safety by promoting competent care-giving; and (3) to enhance parent life-course development by promoting pregnancy planning, educational achievement, and employment.** The program also has two secondary goals: to enhance families' material support by providing links with needed health and social services, and to promote supportive relationships among family and friends. The nurses are trained to follow a very specific set of protocols and home visit guidelines, which they then adapt to each family's strengths and needs.

Healthy Families New York (HFNY)

See http://www.promisingpractices.net/program.asp?programid=147

Support: Promising Practices Network (proven)

Although not designed specifically for addressing school readiness, HFNY is a community-based prevention program that seeks to improve the health and well-being of children at risk for abuse and neglect by providing intensive home visitation services. Through community health and social service agencies and hospitals, the HFNY program **screens** expectant parents and parents with an infant less than three months of age for risk factors that are predictive of child abuse and neglect, including, but not limited to: single parenthood, teen pregnancy, poverty, poor education, unstable housing, substance abuse, and mental health problems. Specially trained paraprofessionals are assigned to the participating families to deliver home visitation services until the child reaches five or is enrolled in Head Start or kindergarten. Home visitors provide families with support, education, and referrals to community services aimed at addressing the following goals: (1) to promote positive parenting skills and parent-child interaction; (2) to prevent child abuse and neglect; (3) to ensure optimal prenatal care and child health and development; and (4) to increase parents' self-sufficiency.

DARE to be You

See http://www.coopext.colostate.edu/DTBY/index.html

Support: Promising Practices Network (proven); Rand Corporation (2005), NREPP, OJJDP (exemplary)

DARE to be You is a multilevel **prevention program** that targets parents of two- to five-year-olds in high-risk families. Risk factors included foster care, child abuse, a parent who dropped out of high school, low annual income, and family history of mental illness or substance abuse. However, to avoid any stigma being attached to program participants, some families who were not considered to be high risk were also included in the program. The center-based program focuses on parenting skills, and the aspects that contribute to youth's resiliency to substance abuse later in life, such as parents' self efficacy, effective child rearing, social support, problem-solving skills, and children's developmental attainments. The program offers 15 to 18 hours of parent training workshops and concurrent children's programs, preferably in a 10- to 12-week period. Other program elements include training for child care providers and training for social service agency workers who work with families.

Triple P--Positive Parenting Program

See http://www.triplep-america.com/documents/TripleP_Model_Table.pdf

Description from: http://nrepp.samhsa.gov/programfulldetails.asp?PROGRAM_ID=218

Supported by: National Registry of Evidence-based Programs and Practices (NREPP), a service of the Substance Abuse and Mental Health Services Administration (SAMHSA).

The Triple P--Positive Parenting Program is a multilevel system or suite of parenting and family support strategies for families with children from birth to age 12, with extensions to families with teenagers ages 13 to 16. Developed for use with families from many cultural groups, Triple P is designed to **prevent social, emotional, behavioral, and developmental problems** in children by enhancing their parents' knowledge, skills, and confidence. The program, which also can be used for early intervention and treatment, is founded on social learning theory and draws on cognitive, developmental, and public health theories. Triple P has five intervention levels of increasing intensity to meet each family's specific needs. Each level includes and builds upon strategies used at previous levels:

- Level 1 (Universal Triple P) is a media-based information strategy designed to increase community awareness of parenting resources, encourage parents to participate in programs, and communicate solutions to common behavioral and developmental concerns.

- Level 2 (Selected Triple P) provides specific advice on how to solve common child developmental issues (e.g., toilet training) and minor child behavior problems (e.g., bedtime problems). Included are parenting tip sheets and videotapes that demonstrate specific parenting strategies. Level 2 is delivered mainly through one or two brief face-to-face 20-minute consultations.

- Level 3 (Primary Care Triple P) targets children with mild to moderate behavior difficulties (e.g., tantrums, fighting with siblings) and includes active skills training that combines advice with rehearsal and self-evaluation to teach parents how to manage these behaviors. Level 3 is delivered through brief and flexible consultation, typically in the form of four 20-minute sessions.

- Level 4 (Standard Triple P and Group Triple P), an intensive strategy for parents of children with more severe behavior difficulties (e.g., aggressive or oppositional behavior), is designed to teach positive parenting skills and their application to a range of target behaviors, settings, and children. Level 4 is delivered in 10 individual or 8 group sessions totaling about 10 hours.

- Level 5 (Enhanced Triple P) is an enhanced behavioral family strategy for families in which parenting difficulties are complicated by other sources of family distress (e.g., relationship conflict, parental depression or high levels of stress). Program modules include practice sessions to enhance parenting

skills, mood management strategies, stress coping skills, and partner support skills. Enhanced Triple P extends Standard Triple P by adding three to five sessions tailored to the needs of the family.

Variations of some Triple P levels are available for parents of young children with developmental disabilities (Stepping Stones Triple P) and for parents who have abused (Pathways Triple P).

Families and Schools Together (FAST)

Description from: http://nrepp.samhsa.gov/programfulldetails.asp?PROGRAM_ID=169

Supported by: National Registry of Evidence-based Programs and Practices (NREPP), a service of the Substance Abuse and Mental Health Services Administration (SAMHSA); The Office of Juvenile Justice and Delinquency Prevention's Model Programs Guide.

Families and Schools Together (FAST) is a multifamily group intervention designed to build relationships between families, schools, and communities to increase well-being among elementary school children. The program's objectives are to **enhance family functioning, prevent school failure, prevent substance misuse** by the children and other family members, and reduce the stress that children and parents experience in daily situations. Participants in the multifamily group work together to enhance protective factors for children, including parent-child bonding, parent involvement in schools, parent networks, family communication, parental authority, and social capital, with the aim of reducing the children's anxiety and aggression and increasing their social skills and attention spans.

FAST includes three components: outreach to parents, eight weekly multifamily group sessions, and ongoing monthly group reunions for up to 24 months to support parents as the primary prevention agents for their children. Collaborative teams of parents/caregivers, professionals (e.g., substance abuse or mental health professionals), and school personnel facilitate the groups, which meet at the school at the end of the school day. With each cycle of FAST implementation, 30 to 50 students in one grade level and their families can participate. Although versions of FAST have been developed for families with children of all ages (babies through teens).

Incredible Years

See www.incredibleyears.com

Support: Promising Practices Network (proven); Rand Corporation (2005)[254], NREPP, OJJDP

The Incredible Years series is a set of comprehensive curricula for children ages 2 to 8 and their parents and teachers. It targets high-risk children or children displaying behavior problems. The curricula are designed to work jointly to promote emotional and social competence and to **prevent, reduce, and treat children's behavioural and emotional problems**. The Incredible Years parent training involves 12 to 14 weekly sessions, emphasizing such parenting skills as how to set limits, how to play with children, and how to handle misbehavior, and incorporates videotaped scenes to encourage group discussion and problem solving. The child-training program uses a small-group curriculum for children exhibiting conduct problems, and is offered in weekly sessions for 18 to 20 weeks. Entitled the Incredible Years Dinosaur Social Skills and Problem-Solving Child Training Program, it teaches skills such as emotional literacy, empathy or perspective taking, friendship and communication skills, anger management, interpersonal problem solving, and how to be successful at school. The Incredible Years has been in operation since 1980 in multiple sites in the U.S., as well as sites in Canada, the UK, and Sweden.

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Early Childhood Care, Education and Family Support

Carolina Abecedarian Project

See http://www.fpg.unc.edu/~abc/

Support: Promising Practices Network (proven); Rand Corporation (2005), CEBP

The Carolina Abecedarian Project was a comprehensive early education program for young children at risk for developmental delays and school failure. The program operated in a single site in North Carolina between 1972 and 1985, and it involved both a preschool component and a school-age component. Children entered the program from infancy up to 6 months of age. The preschool program offered a full-day, year-round, center-based stimulating and structured environment, along with **nutritional supplements, paediatric care, and social work services**. The type of service included family support, instructional support and risk prevention. Infants began attending the preschool program between 6 weeks and 3 months of age, and continued until entry into kindergarten. Children attended the day care center 6 to 8 hours a day, 5 days per week, 50 weeks per year. After the children turned 3 years old, they received a more structured set of educational curricula, which increasingly became more similar to programs in the local public kindergartens as the children grew older. **Paediatric care was provided by a team of on-site research nurses and paediatricians.**

Child-Parent Centers

See http://www.promisingpractices.net/program.asp?programid=98

Support: Promising Practices Network (proven); Rand Corporation (2005), The Office of Juvenile Justice and Delinquency Prevention's Model Programs Guide (Exemplary)

The Chicago Child-Parent Centers (CPCs) provide comprehensive educational support and family support to economically disadvantaged children and their parents. The guiding principle of the program is that by providing a school-based, stable learning environment during preschool, in which parents are active and consistent participants in their child's education, scholastic success will follow. The program requires parental participation and emphasizes a child-centered, individualized approach to social and cognitive development. CPC programming is currently only available to children in preschool. A full-time staff member provides outreach services to CPC families. This outreach includes (1) recruiting families from the neighborhood who are most in need of CPC programming; (2) conducting home visits to families upon child enrollment and on a continuing as-needed basis; and (3) referring families to community and social services agencies, such as agencies providing employment training, mental health services, and welfare. The outreach worker provides transportation services to the center for families in need. Upon enrollment, all entering children undergo **a physical health screening, during which the child's vision and hearing are tested.** This screening is typically done off-site. All students receive free breakfast and lunch.

Perry Preschool Project

Description from http://www.promisingpractices.net/program.asp?programid=128

Support: Promising Practices Network (proven); Rand Corporation (2005), The Office of Juvenile Justice and Delinquency Prevention's Model Programs Guide (Exemplary), CEBP.

The Perry Preschool Project was designed for at-risk students (low IQ scores from families of low socioeconomic status and who were considered to be at high risk for school failure). Children entered the preschool program at

age 3 or 4. The program uses an open framework of educational ideas and practices based on the natural development of young children. Drawing on the child development work of psychologist Jean Piaget, the program emphasizes an active learning approach (learning through active and direct child-initiated experiences rather than directed teaching), in which children are encouraged to engage in play activities that involve making choices and problem-solving. The goal of the curriculum is to **promote a child's intellectual, social, and emotional learning and development.** The teachers conducted daily two and one-half hour-long classroom sessions on weekday mornings for children and weekly one and one-half hour-long home visits to each mother and child on weekday afternoons during the course of a 30-week school year. The home visits were intended to involve the mother in the educational process and to help her to provide her child with education support and implement the curriculum within the child's home. The Perry Preschool Project study followed the children for nearly three decades, documenting the long-term effects of program participation on their lives.

Early Head Start

See http://www.promisingpractices.net/program.asp?programid=135

Description from: http://www.acf.hhs.gov/programs/hsb/programs/ehs/ehs2.htm

Support: Promising Practices Network (proven); Rand Corporation, The Office of Juvenile Justice and Delinquency Prevention's Model Programs Guide (promising)

Early Head Start (EHS) is an American federally funded community-based program for low-income pregnant women and families with infants and toddlers up to age 3. Its mission is to promote healthy prenatal outcomes for pregnant women, enhance the development of children age 0-3, and support healthy family functioning. Since its inception in 1994, EHS has become a nationwide effort of 708 community-based programs serving 61,500 children in 2003. EHS programs utilize multiple strategies to provide a wide range of services to participants. Services include child development services delivered in home visits, child care, **comprehensive health and mental health services**, parenting education, **nutrition education, health care and referrals**, and family support. EHS offers children and families comprehensive child development services through one or more official program options: (1) center-based, (2) home-based, and (3) combination programs (in which families receive both home visits and center experiences). Children and families enrolled in center-based programs receive comprehensive child development services in a center-based setting, supplemented with home visits by the child's teacher and other EHS staff (a minimum of two home visits a year to each family). In home-based programs, children and their families are supported through weekly home visits and bimonthly group socialization experiences. The EHS program targets primarily low-income pregnant women and families with children up to 3 years of age. No single program model exists, and each site selects delivery options that will best meet the needs of the families and communities it serves. The services that programs must provide directly or through a referral include early-education services in a range of developmentally appropriate settings, home visits, parent education and parent-child activities, **comprehensive health and mental health services**, and high-quality child care services.

Early Childhood Social-Emotional Programs

Primary Project

Description from: http://nrepp.samhsa.gov/programfulldetails.asp?PROGRAM_ID=106

Supported by: National Registry of Evidence-based Programs and Practices (NREPP), a service of the Substance Abuse and Mental Health Services Administration (SAMHSA); The Office of Juvenile Justice and Delinquency Prevention's Model Programs Guide (promising)

Primary Project (formerly the Primary Mental Health Project, or PMHP) is a school-based program designed for **early detection and prevention** of school adjustment difficulties in children 4-9 years old (preschool through 3rd grade). The program begins with screening to identify children with early school adjustment difficulties (e.g., mild aggression, withdrawal, and learning difficulties) that interfere with learning. Following identification, children are referred to a series of one-on-one sessions with a trained paraprofessional who utilizes developmentally appropriate child-led play and relationship techniques to help adjustment to the school environment. Children generally are seen weekly for 30-40 minutes for 10-14 weeks. During the session, the trained child associate works to create a nonjudgmental atmosphere while establishing limits on the length of sessions, aggression toward self or others, and destruction of property. Targeted outcomes for children in Primary Project include increased task orientation, behavior control, assertiveness, and peer social skills. The program is suitable for implementation in a specially designed place on a school campus equipped with expressive toys and materials (art media, building toys, imaginative toys).

Promoting Alternative THinking Strategies (PATHS), PATHS Preschool

Description from: http://nrepp.samhsa.gov/programfulldetails.asp?PROGRAM_ID=127

Supported by: National Registry of Evidence-based Programs and Practices (NREPP), a service of the Substance Abuse and Mental Health Services Administration (SAMHSA); OJJDP; Promising Practices Network (screened); The Office of Juvenile Justice and Delinquency Prevention's Model Programs Guide (Exemplary), CASEL (proven).

Promoting Alternative THinking Strategies (PATHS) and PATHS Preschool are school-based **preventive interventions** for children in elementary school or preschool. The interventions are designed to enhance areas of social-emotional development such as self-control, self-esteem, emotional awareness, social skills, friendships, and interpersonal problem-solving skills while reducing aggression and other behavior problems. Skill concepts are presented through direct instruction, discussion, modeling, storytelling, role-playing activities, and video presentations. The elementary school PATHS Curriculum is available in two units: the PATHS Turtle Unit for kindergarten and the PATHS Basic Kit for grades 1-6. The curriculum includes 131 20- to 30-minute lessons designed to be taught by regular classroom teachers approximately 3 times per week over the course of a school year. PATHS Preschool, an adaptation of PATHS for children 3 to 5 years old, is designed to be implemented over a 2-year period. Its lessons and activities highlight writing, reading, storytelling, singing, drawing, science, and math concepts and help students build the critical cognitive skills necessary for school readiness and academic success. The PATHS Preschool program can be integrated into existing learning environments and adapted to suit individual classroom needs.

Al's Pals: Kids Making Healthy Choices

Description from: http://nrepp.samhsa.gov/programfulldetails.asp?PROGRAM_ID=154

Supported by: National Registry of Evidence-based Programs and Practices (NREPP), a service of the Substance Abuse and Mental Health Services Administration (SAMHSA); The Office of Juvenile Justice and Delinquency Prevention's Model Programs Guide (Exemplary).

Al's Pals: Kids Making Healthy Choices is a school-based **prevention program** that seeks to develop social-

emotional skills such as self-control, problem-solving, and healthy decision-making in children ages 3-8 in preschool, kindergarten, and first grade. The program fosters both the personal traits of resilience and the nurturing environments children need to overcome difficulties and fully develop their talents and capabilities. Through fun lessons, engaging puppets, original music and materials, and appropriate teaching approaches, the Al's Pals curriculum helps young children regulate their own feelings and behavior; creates and maintains a classroom environment of caring, cooperation, respect, and responsibility; teaches conflict resolution and peaceful problem-solving; promotes appreciation of differences and positive social relationships; prevents and addresses bullying behavior; conveys clear messages about the harms of alcohol, tobacco, and other drugs; and builds children's abilities to make healthy choices and cope with life's difficulties. The program consists of a year-long, 46-session interactive curriculum delivered by trained classroom teachers who use Al's Pals teaching approaches to infuse the concepts into daily interactions with the children. Ongoing communication with parents is also part of Al's Pals. Teachers regularly send parents letters to update them about the skills the children are learning, suggest home activities to reinforce these concepts, and inform parents about their child's progress.

PROMISING PRACTICES

Toronto First Duty (TFD)

See http://www.toronto.ca/firstduty/service.htm

Research: http://www.toronto.ca/firstduty/tfd_research_summary.pdf

The integrated early childhood service delivery model pioneered by Toronto First Duty (TFD) envisions regulated child care, kindergarten and family support services consolidated into a single, accessible program, located in primary schools and **coordinated with early intervention and family health services**. In this delivery model, a professional team of kindergarten teachers, early childhood educators, family support staff and teaching assistants plan and deliver the program. Space and resources are combined. There is a single intake procedure and flexible enrolment options. Children and families are linked to specialized resources as required. The goal of Toronto First Duty is to develop a universally accessible service that promotes the healthy development of children from conception through primary school, while at the same time facilitating parents' work or study and offering support to their parenting role. The project is designed to inform public policy by demonstrating the feasibility of the main recommendation of the _Early Years Study_. It allows governments to test-drive the transformation of the existing patchwork of programs into a single, integrated and comprehensive early childhood program. Preliminary data indicates that children in TFD programs had significant improvements in language development (vocabulary), total TERA (measuring dimensions like print awareness and comprehension), and number knowledge as well as school readiness using the EDI. More research is needed as the sample sizes were small.

Sure Start

Source: http://www.surestart.gov.uk/surestartservices/settings/introduction/

Research: National evaluation- See http://www.surestart.gov.uk/research/evaluations/ness/

Sure Start (SSLP) brings together childcare, early education, **health and family support services** for families with children under 5 years old. It is the cornerstone of the Government's drive to tackle child poverty and social exclusion working with parents-to-be, parents/carers and children to promote the physical, intellectual and social development of babies and young children so that they can flourish at home and when they get to school. _Sure Start_ brings together service providers – health, social services and early education, voluntary, private and community organizations and parents, to provide integrated services for young children and their families based on what local children need and parents want. A core set of services are provided at each site and include: home visiting, family supports, learning and childcare facilities, primary and community health, advice about child and family heath, support for people with special needs and good quality play opportunities.

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Smart Start

Description from: http://www.promisingpractices.net/program.asp?programid=116

Support: Promising Practices Network (promising).

Smart Start is a comprehensive public-private community-based initiative to help all North Carolina children enter school ready to succeed. Created in 1993, the primary focus of Smart Start is to provide families with access to high-quality childcare. The program is predicated on the notions that (1) the first six years of life are the most critical; (2) better quality childcare programs can increase a child's ability at school entry; and (3) a child's ability at school entry can often predict later academic success. Currently, 81 local partnerships, encompassing all of North Carolina's 100 counties, have begun implementation of Smart Start to assure that children in their communities begin school healthy and ready to succeed.

Smart Start's approach allows communities to make decisions and plans that are specific to the needs of their young children and families. All Smart Start programs are based on three core areas: (1) child care and education; (2) **health care and education**; and (3) family support and education. The individual services provided by each site under these core areas are tailored to each community depending on its specific needs, goals, and priorities. As such, the full range of services is not likely to be available at all sites. All children with geographic access to a Smart Start program are eligible to participate. Although not specifically aimed toward children of low income, the program does attempt to reach those who would not otherwise necessarily have access to high-quality services such as childcare

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