CORE
Public Health Functions for BC

Model Core Program Paper:

Healthy Infant and Child Development

BC Health Authorities **BC Ministry of Healthy Living and Sport**

This Model Core Program Paper was prepared by a working group consisting of representatives of the BC Ministry of Healthy Living and Sport and BC's health authorities.

This paper is based upon a review of evidence and best practice, and as such may include practices that are not currently implemented throughout the public health system in BC. This is to be expected, as the purpose of the Core Public Health Functions process—consistent with the quality improvement approach widely adopted in private and public sector organizations across Canada—is to put in place a performance improvement process to move the public health system in BC towards evidence-based best practice. Where warranted, health authorities will develop public performance improvement plans with feasible performance targets and will develop and implement performance improvement strategies that move them towards best practice in the program component areas identified in this Model Program Paper.

This Model Program Paper should be read in conjunction with the accompanying review of evidence and best practice.

Model Core Program Paper approved by:
Core Functions Steering Committee (May 2009)
BC Ministry of Healthy Living and Sport (May 2009)

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EXECUTIVE SUMMARY

This paper identifies the core elements that should be provided by British Columbia health authorities to support healthy infant and early childhood development. It is intended, as part of the BC Core Functions in Public Health, to reflect evidence-based practice and support continuous performance improvement.

A Working Group of representatives from the Ministry of Healthy Living and Sport, Provincial Health Services Authority and the health authorities worked together in the development of this paper. The Working Group agreed that the overall goal of the program for healthy infant and child development is to maximize the healthy physical, emotional and social development of infants and children, from 7 days to 5 years of age (up to the 6th birthday). The specific objectives are to:

- Protect, support and enhance infant and child physical health, emotional health, intellectual and cognitive ability, social knowledge and competence, language and communication skills.
- Increase systemic support for promoting and maintaining healthy environments and healthy early childhood development at family, community, school and regional levels.
- Enhance the early identification of infants and children living in conditions of risk.
- Prevent or reduce vulnerabilities and risks that represent a threat to healthy infant and child development, including the prevention of disease, disability and injury.
- Reduce the health disparities experienced by vulnerable populations of children.

Key principles and overarching strategies include:

- A comprehensive and integrated approach using a wide range of strategies.
- Multidisciplinary and multi-sectoral collaboration.
- A population health and determinants of health approach that considers protective factors, risk factors and vulnerable populations.
- Promotion of health and well-being and empowerment of children, families and communities to enhance positive outcomes.
- Support across the continuum of growth and key transition points in early childhood development.
- A combination of universal interventions for early childhood health and development and targeted interventions for vulnerable, at-risk children, families and groups.
- Support for diverse groups including responsiveness to the needs of Aboriginal children and families, and vulnerable ethnic and cultural groups.

The major program components for healthy infant and child development are:

- Leadership and advocacy.
- Health promotion.
- Prevention initiatives and early identification of risk or vulnerability.
- Surveillance, monitoring and program evaluation.

Best practices and promising practices for each program component, based on the evidence and experience of experts in the field are:

- Leadership and advocacy
    - Coordinating the development and implementation of a long-term, comprehensive, multi-sectoral strategy for healthy infant and early childhood development.
    - Identifying key policies and optimal processes for the healthy infant and child development programs.
    - Advocating for healthy public policies on regional early childhood development priorities in collaboration with partners and stakeholders.
- Health promotion
    - Increasing public information and awareness about the importance of and factors that enhance healthy infant and child development.
    - Collaborating with partners and stakeholders in community development and community capacity building to strengthen local services and supports for healthy infant and early childhood development.
- Prevention initiatives and early identification of risk or vulnerability (through well-baby/well-child clinics, group sessions and home visits):
    - Universal or population-based interventions such as proactive support for breastfeeding, education and support for new parents.
    - Ongoing health advice, education and support for infants, toddlers and preschool children and their families, to enhance parent's knowledge and skills and to promote healthy early childhood development.
    - Identifying vulnerabilities and risks (e.g., developmental delays, parenting skills, family dynamics, environment and neighbourhood, socio-economic factors, etc.), through developmental surveillance, eliciting parent concerns, observation, and use of a validated risk assessment tool where indicated.
    - Targeted interventions for at-risk and vulnerable children and their families (in collaboration with other health professionals, partner agencies and other ministries as appropriate), including parent education and support; cognitive,

social and emotional development; nutrition programs; environmental health; specialized services for preterm and low birth weight infants; and collaboration with Aboriginal groups for community-based program delivery.

- Surveillance, monitoring and program evaluation
    - Gathering and analyzing information to identify trends, issues and community risk factors, as a basis for program planning and evaluation.
    - Developing an information system to integrate data on infant and child health and development.
    - Establishing evaluation frameworks and conducting evaluations of new programs.

The Working Group emphasized the importance of recognizing and addressing the determinants of health as they relate to healthy infant and child development core programs. This is reflected throughout the document.

1.0 OVERVIEW/SETTING THE CONTEXT

As demonstrated in recent Canadian reports, public health needs to be better structured and resourced, in order to improve the health of the population. The Framework for Core Functions in Public Health is a component of that renewal in British Columbia. It defines and describes the core public health activities of a comprehensive public health system. This policy framework was accepted in 2005 by the then-Ministry of Health and the health authorities.

Implementation of core functions will establish a performance improvement process for public health, developed in collaboration between the Ministry of Healthy Living and Sport, the health authorities and the public health field. This process will result in greater consistency of public health services across the province, increased capacity and quality of public health services and improved health of the population. To ensure collaboration and feasibility of implementation, the oversight of the development of the performance improvement process is managed by a Provincial Steering Committee, with membership representing all health authorities and the ministry.

What are core programs? They are long-term programs representing public health services that health authorities provide in a renewed and modern public health system. Core programs are organized to improve health; they can be assessed ultimately in terms of improved health and well-being and/or reductions in disease, disability and injury. In total, 21 programs have been identified as "core programs," of which the program for healthy infant and child development is but one.

In a "model core program paper," each program will have clear goals, measurable objectives and an evidentiary base that shows it can improve people's health and prevent disease, disability and/or injury. Programs will be supported through the identification of best practices and national and international benchmarks (where such benchmarks exist). Each paper will be informed by an evidence paper, other key documents related to the program area and by key expert input obtained through a working group with representatives from each health authority and the Ministry of Healthy Living and Sport.

The Provincial Steering Committee has indicated that an approved model core program paper constitutes a model of good practice, while recognizing it will need to be modified to meet local context and needs. While health authorities must deliver all core programs, how each is provided is the responsibility of the health authority, as are the performance improvement targets they set for themselves.

It is envisioned that the performance improvement process will be implemented over several years. During that time the process will contribute to and benefit from related initiatives in public health infrastructure, health information and surveillance systems, workforce competence assessment and development, and research and evaluation at the regional, provincial and national levels.

1.1 An Introduction to This Paper

This model core program paper is one element in an overall public health performance improvement strategy developed by the Ministry of Healthy Living and Sport in collaboration with provincial health authorities and experts in the field of public health. It builds on previous work from a number of sources.

In March 2005, the then-Ministry of Health released a document entitled *A Framework for Core Functions in Public Health*. This document was prepared in consultation with representatives of health authorities and experts in the field of public health. It identifies the core programs that must be provided by health authorities, and the public health strategies that can be used to implement these core programs. It provides an overall framework for the development of this document.

Other documents that have informed this paper include:

- *Core Public Health Prevention Functions: Early Childhood Health and Development, Evidence Paper* (2007), by J. Reiter, D. Leach, and K. Yarker-Edgar, for the Ministry of Health, Population Health and Wellness.

A Working Group on Healthy Infant and Child Development was formed in 2008, of experts from the Ministry of Healthy Living and Sport, the Provincial Health Services Authority and the health authorities. The group provided guidance and direction in the development of the model core program paper during meetings in June and October 2008 and March 2009, as well as through telephone and e-mail discussions.

1.2 Introduction to Healthy Infant and Child Development

Healthy infant and early childhood development is a powerful determinant of health (F/P/T Advisory Committee on Population Health, 1999). There is now substantial evidence to suggest that development of the infant and young child—neurologically, physiologically, psychologically and emotionally—plays a significant role in determining their lifelong physical, mental and social health and well-being. As Wadsworth (1999, as cited in Ministry of Health [MOH], 2005) observed

> research shows that early life health is, for each child, the basis of health in adult life. Therefore investment in health in early life has beneficial effects: it pays off through increased school readiness and school success, future productivity, reduced violence and crime and lower costs for health and public services.

This model core program should be viewed as part of a continuum, along with the programs on reproductive health and prevention of disabilities, and healthy child and youth. Where appropriate this program is aligned with these programs as well as other related core programs.

1.2.1 Protective Factors

There is considerable public health experience in strengthening protective factors for infants and young children. Protective factors such as affectionate and stable relationships, social support and social connectedness are effective in supporting the development of emotional health and

positive relationships (Payton et al., 2000). For example, a loving, secure attachment between parents/caregivers and babies in the first 18 months of life helps children develop trust, self-esteem, emotional control and the ability to have positive relationships with others in later life (F/P/T Ministers of Health, 1999). Stable family and social relationships, effective parenting skills, adequate family income, safe housing, safe neighbourhoods, and healthy supportive community environments are important predictors of healthy development (Payton et al., 2000; World Health Organization [WHO], 2002). Social and emotional health also enables children to cope with adversity and build resilience in dealing with the stresses of life. Conversely, children deprived of attentive and stable care, and safe and adequate housing, and children who experience social isolation, abuse, neglect or violence are at risk for a number of behavioural, social and cognitive problems later in life (Payton et al., 2000).

1.2.2 Risks / Vulnerability Factors

In Canada, inequalities in early child development emerge in a systematic fashion over the first five years of life according to well-recognized risk factors (Hertzman et al., 2004). “Vulnerable populations are those with a greater-than-average risk of developing health problems (Aday, 2001 by virtue of their marginalized sociocultural status, their limited access to economic resources, or personal characteristics such as age and gender” (deChesnay, 2005). The threats to healthy early child development are found across the entire socio-economic spectrum, although at increasing intensity among lower socio-economic levels. While there are no widely accepted determinants of child health, the factors considered by a number of experts (Hertzman et al., 2004; Payton et al., 2000; WHO, 2002), to be important influences in early childhood development are:

- Socio-economic status (e.g., low family income and lower parent education levels are risk factors).
- Parenting style (e.g., positive styles are related to positive outcomes).
- Social and emotional learning and cognitive stimulation (and conversely, social isolation, neglect, abuse and violence).
- Neighbourhood safety, cohesion and socio-economic character.
- Physical characteristics including low birth weight, genetic make-up, hearing, vision and speech abilities.
- Access to quality child care and developmental opportunities.
- Gender, race and ethnicity.
- Environmental conditions (e.g., living close to hazardous waste sites, or smelters).
- Food security.

Childhood vulnerability is frequently assessed in relation to five key domains, measured by BC school districts using the Early Development Instrument (EDI) (Human Early Learning Partnership, n.d.; WHO, 2006):

- Physical health and well-being.

- Social competence.
- Emotional maturity.
- Language and cognitive development.
- Communication skills and general knowledge.

Development across these five domains is influenced by a wide range of factors, including maternal health; genetic make-up; early and ongoing physical, mental and intellectual stimulation of the infant; nutritional quality; stable family and social relationships; and the quality of the physical environment (Mustard & Pickerack, 2002).

1.2.3 Early Childhood Health and Development in BC

Early childhood development issues include:

- The rate of vulnerability among BC children, as measured by the EDI, varies across school districts, from a low of 13 per cent in Kootenay-Columbia to a high of almost 40 per cent in Prince Rupert. Prince Rupert, Vancouver, Vancouver Island North, Stikine and Burnaby are the five school districts with the highest levels of vulnerability on one or more EDI scales (Kershaw, Irwin, Trafford, & Hertzman, 2005).
- BC has the highest rate of childhood poverty in the country, with more than 15 per cent of children in the province living in low-income families (Statistics Canada, Canadian Community Health Survey [CCHS], 2005). New research suggests that living in poverty is linked to considerably higher developmental risks, including social exclusion, shame, and reduced self-esteem and self-respect.
- 46 per cent of low-income and 14 per cent of middle-income individuals are food insecure in BC (Ledrou & Gervais, 2005).
- The BC preterm birth rate in 2005/2006 was 9.7 births per 100, a slight increase over 2004/2005 (BC Perinatal Database Registry, 2007). Preterm infants are at increased risk of short- and long-term pulmonary morbidity, ophthalmologic morbidity, neurologic morbidity and delayed psychomotor development (McCormick, 1985).
- Approximately 3.5 per cent of the BC population under 15 years of age has a disability, and 1.4 per cent of these are severe (2002). For example:
    - 23 children (under 15 years of age) per 1,000 have disabilities such as visual impairments/blindness, epilepsy, mental disability, developmental delays, cerebral palsy, autism, etc. (2002).[1]
    - 9 births per 1,000 are estimated to have fetal alcohol spectrum disorder (FASD) and 3.5 per 1,000 to have fetal alcohol syndrome (FAS).[2]

[1] The BC Health Status Registry Report, produced by BC Vital Statistics Agency, provides data based on voluntary reporting of conditions by health care agencies and providers.
[2] Estimated by the Provincial Health Services Authority.

- 7 per cent of BC children were obese in 2004 (compared to 9 per cent in Canada), and 20 per cent of BC children and youth were overweight, the same rate for Canada as a whole in 2004 (Select Standing Committee on Health, 2006).
- Unintentional injuries have a significant impact on young children:
    - The largest contributor to the death rate of children, age 1–4 years, is unintentional injury (Canadian Council on Social Development et al., 2007); the leading causes among BC children (1989 to 2000) are motor vehicle crashes (61 per cent), drowning (9 per cent), poisoning (8 per cent) and falls (4 per cent).
    - The causes of hospitalization due to children's injuries in BC are falls (33 per cent), motor vehicle traffic (19 per cent), struck by an object (12 per cent), and non-motor vehicle pedal cycle (5 per cent) (BC Injury Research and Prevention Unit [BCIRPU], 2006).
- It is estimated that 7 per cent of children born in BC each year have a visual impairment Canadian Agency for Drugs and Technologies in Health, 2006, as cited in Ministry of Healthy Living and Sport [MHLS], n.d.), and permanent hearing loss affects at least 1 to 6 babies per 1,000 births (Early Hearing Detection and Intervention BC Steering Committee, 2004, as cited in MHLS, n.d.).
- The BC aboriginal population experiences significant health risks compared to the general population. For example:
    - The infant mortality rate, widely accepted as a measure of health status of a population, was 8.6 (per 1,000 live births) among BC Status Indians during 2000–2004 (5-year aggregate) compared to 3.7 (per 1,000) for other BC residents (Provincial Health Officer [PHO], 2007).
    - Aboriginal people are at particular risk for food insecurity and poor nutritional status (Riches, 2004).
    - The percentage of BC teen mothers in the Status Indian population was 16.3 per cent (2004), compared to 2.4 per cent for other BC residents (PHO, 2007).
    - 14 to 24 per cent of Canadian First Nations preschoolers suffer from iron deficient anemia, compared to 4 to 5 per cent of non-Aboriginal preschool children in Canada (BC data is not available) (Zlotkin, Ste-Marie, Kopelman, Jones, & Adam, 1996).
- In 2005, there were 9,080 BC children in care, which is approximately 1 per cent of all children in the province. Of these, 60 per cent were in continuing care and 40 per cent were in temporary care. Forty-nine per cent of children in care are Aboriginal, even though Aboriginal children make up only 7 per cent of the child population in BC (Child and Youth Officer & PHO, 2006).
- Additional at-risk populations include children with chronic diseases.

Also, there are a number of positive early childhood development trends. For example:

- An increasing number of BC mothers breastfeed their babies: in 2003, 93.3 per cent of mothers initiated breastfeeding; 55 per cent breastfed for at least 6 months and 28.8 per cent did so exclusively (Statistics Canada, 2003). Breastfeeding improves infant and child health and prevents a number of diseases such as cardiovascular disease, obesity, diabetes, sudden infant death syndrome, etc. (MOH, Population Health and Wellness [PHW], 2007a).

- Teen pregnancy and birth rates have been declining over the past decade. The rate of teen pregnancies has decreased from 44/1,000 in 1997 to 24/1,000 in 2006.

- In 2002/2003, 49 per cent of BC children aged 6 months to 5 years were in some form of child care: about 30 per cent of these children attended group day care centres (Statistics Canada, 2006). Research has demonstrated significant health and social benefits resulting from quality child care among higher risk populations. These benefits include gains in emotional and cognitive development; improved parent-child relationships; improved health-related indicators, such as maternal reproductive health; decreased child abuse and maternal substance abuse; and long-term outcomes such as improved educational attainment, increased economic self-sufficiency, higher incomes and lower welfare usage, and reduced levels of criminal activity (Appendix 1).

- Overall, the majority of children develop in a healthy manner. For example, of Canadian children in 2002/2003 (BC data not available) (Government of Canada, 2003):

    - 86.4 per cent, from birth to 3 years, show signs of average to advanced motor and social development.

    - 84.3 per cent, age 2 to 5 years, show age-appropriate personal and social behaviours.

    - 83.3 per cent, age 2 to 5 years, do not display signs associated with emotional problems or anxiety.

    - 85.7 per cent, age 4 to 5 years, display average to advanced levels of cognitive development.

    - 86.9 per cent, age 4 to 5 years, display average to advanced levels of verbal development.

1.2.4 Cost-Benefits of Intervention Programs for Children At Risk

A number of longitudinal, controlled studies have been conducted to assess the cost-effectiveness of early childhood intervention programs. The research demonstrates that for every $1 invested in early childhood development programs, the return was at least $4 to $7, representing a benefit to government and to society (Appendix 1 provides additional detail on these findings). In summary:

- The Perry (California) Preschool, a high-quality, active learning preschool program, was studied to assess short- and long-term benefits to children living in poverty. At age 27 years, participants had significantly higher earnings, rates of home ownership, levels of schooling, as well as fewer arrests and social service interventions than a control group. Cost-benefit analysis estimated that for every $1 expenditure in preschool programming, an estimated $7.16 was saved in later costs for special education, social services, justice and remediation (Schweinhart, Barnes, & Weikart, 1993).
- A RAND study in 2005 found a net benefit to society of $34,148 per participant, or a $5.70 return per dollar invested, in early childhood programs (Karoly, Kilburn, & Cannon, 2005).
- The Chicago Child-Parent Center studied effects of educational enrichment and comprehensive family services on preschool low-income minority children, using a longitudinal study and analysis at age 24 years. Researchers concluded that early education programs had enduring effects, and resulted in a return to society of $7.10 for every $1 spent (Wise, da Silva, Webster, & Sanson 2005).
- A cost-benefit analysis of the Carolina Abecedarian Project, an intensive full-time care program for children up to 5 years, found that the benefits outweighed the costs with a return of $4 for every $1 spent
- A study of Elmira Prenatal/Early Infant Project found benefits exceeded the costs only for families where the mother was of low income and unmarried: in these cases the costs of the project per child for 2½ years of service was recovered before the children turned 4 years old and the intervention saved $4 for every $1 spent (Wise et al., 2005).

1.3 Linkages With Other Health Programs

Collaboration and coordination with other key programs is essential to ensure a coordinated cross-disciplinary approach to services for infants and preschool children. Key partners include primary care and acute care providers as well as other core public health programs. In some cases, integration of program planning and delivery systems will be necessary to strengthen services with similar goals and common client groups, overlapping issues and risk factors, or programs that provide a continuum of services (such as reproductive health, healthy infant and child development and healthy child and youth development programs).

As well, collaboration with other ministries is necessary on a provincial regional and local level, in particular the Ministries of Health Services, Children and Family Development, Housing and Social Development, Education, and Aboriginal Relations and Reconciliation. Collaboration and partnerships on a community level are also vital to influence local governments and enhance services provided by child care centres, social service agencies, schools, recreational programs and other initiatives that provide support to children.

Multi-disciplinary and multi-sectoral collaboration is highlighted as a fundamental principle of the healthy infant and early childhood development program and is discussed more fully in Section 4.1.

2.0 SCOPE AND AUTHORITY FOR HEALTHY INFANT AND EARLY CHILDHOOD DEVELOPMENT

In order to implement programs for healthy infant and child development, there must be clarity on the roles and responsibilities of the Ministry of Healthy Living and Sport, the Ministry of Health Services, the Provincial Health Services Authority, the health authorities and other ministries and levels of government.

2.1 National Roles and Responsibilities

The Public Health Agency of Canada (PHAC), Division of Childhood and Adolescence, focuses on policy development, research and strategic analysis of trends related to broad determinants of children and youth health in Canada. It provides

- The Community Action Program for Children (CAPC), a long-term funding program for community coalitions to deliver programs that address health and development of children (0–6 years) living in conditions of risk.

- Four Centres of Excellence for Children's Well-Being across the country, each of which focuses on a specific topics: Centre of Excellence for Child Welfare located at the University of Toronto, Centre of Excellence for Early Childhood Development located at the Universite de Montreal, the Centre of Excellence for Children and Adolescents with Special Needs, sponsored by Lakehead University, and the Centre of Excellence for Youth Engagement based at the Students Commission of Canada.

- A Family Violence Initiative and the National Clearinghouse on Family Violence.

- Health promotion initiatives to protect children from violence, abuse, exploitation, injury and neglect; and promotion of safe, supportive environments for children including safe built environments, safe play spaces, safe transportation, water safety and a safe physical/natural environment.

- Promotion of, and reporting related to, the United Nations Convention on the Rights of the Child.

- Health Canada, First Nations and Inuit Health, provides health promotion and health care services for children and families on reserves. The Aboriginal Head Start program is provided not only on reserves but also in urban and northern communities.

- Human Resources Development Canada provides maternity and parental benefits under the Employment Insurance Program, assistance to communities in implementing capacity building to enhance services for young children (Understanding the Early Years program), and the First Nations and Inuit Child Care Initiative. Other federal government programs include the Canada Child Tax Benefit program through the Canada Revenue Agency.

2.2 Provincial Roles and Responsibilities

2.2.1 Ministry of Healthy Living and Sport Roles and Responsibilities

The mandate of the Ministry of Healthy Living and Sport is to

- Promote health and prevent disease, disability and injury.
- Protect people from harm.
- Facilitate quality opportunities to increase physical activity, participation and excellence in sport.
- Support the health, independence and continuing contributions of women and older people.

In its stewardship role, the Ministry of Healthy Living and Sport provides leadership, strategic policy direction, legislation and monitoring for public health and sports programs to support the delivery of appropriate and effective public health services in the province. The ministry has a role in addressing health inequalities, with a specific focus on the development of policies and programs to close the gap in Aboriginal health status. The Ministry works with the health authorities to provide accountability to government and the public for public health service outcomes.

Specifically in the area of healthy infant and child development, the Ministry of Healthy Living and Sport is responsible for the following:

- Advising the Minister on infant and early childhood health and development policies and legislation.
- Consulting and collaborating with health authorities, clinical and academic partners in the development of plans and strategies to outline provincial priorities and establish policy, best practices and service frameworks to maximize infant and early childhood health and development; prevent disease, disability and injury; and provide early interventions.
- Facilitating collaborative partnerships with other provincial ministries and agencies, the federal government, and federal/provincial forums on infant and early childhood health.
- Planning for human resources in infant and child health and development, including definitions of professional practice competencies.
- Providing a strong leadership and advocacy role in cross-government policy development and long-term planning for infant and early childhood health and development, and related healthy living and Aboriginal infant and child health and development policies and programs.
- Supporting research on prevalence, effective interventions, and estimated costs and benefits to enhance infant and early childhood health and development.
- Providing leadership for Act Now BC with respect to healthy infant and child development.

2.2.2 Other Provincial Ministries Roles and Responsibilities

Ministry of Health Services

The Ministry of Healthy Living and Sport has a unique relationship with the Ministry of Health Services as they are the primary linkage to the regional health authorities and are responsible for service delivery of public health programs. The role and functions of the Ministry of Health Services are predominantly focused on: leadership for the delivery of health services and programs; funding and accountability for regional health authorities; ensuring long-term sustainability of the health care system; improved patient care; leadership, direction and support to health care service delivery partners; setting province-wide goals, standards and expectations for health care service delivery by health authorities; and management of the Medical Services Plan, Pharmacare, Ambulance Services, and BC HealthGuide self care program.

Ministry of Children and Family Development

The Ministry of Children and Family Development (MCFD) provides support to children and their families and plays a major role with respect to healthy infant and child development. It has a lead role in child protection and services for children and youth with special needs, autism spectrum disorder, fetal alcohol spectrum disorder, and mental health disorders, as well as child care, adoption and foster care services. Programs and services include:

- The Infant Development Program, offered through 52 locations across BC, provides services to children from birth to 3 years old who are at risk for, or who already have, a delay in development. It links families to special needs services.

- The Early Intervention Therapy Program provides community-based physiotherapy, occupational therapy, speech-language pathology and family support worker services to preschool children who have, or are at risk of, a developmental delay or disability. Community agencies provide services in home, preschool, child care and community settings.

- Aboriginal Early Childhood Development is focused on comprehensive, integrated and culturally appropriate community-based programs in BC Aboriginal communities. It aims to increase the health and well-being of Aboriginal children, strengthen the capacity of Aboriginal communities to deliver a full range of services on early childhood development, and increase awareness, outreach and access to a wide range of programs.

- MCFD provides “supported child development” through agencies that offer consulting and support services for children who require extra support in regular child care settings. Families and children are assessed and linked to available resources in their community.

- Other early childhood development initiatives include partnerships, such as Success by 6, a community-driven United Way initiative dedicated to educate the community about the importance of the early years and to mobilize local resources to invest in prevention-focused child-friendly communities that support healthy growth and development. The Children First Initiative is also a community development/capacity building initiative focused on working with local groups to address and plan for the unique needs of children, 0-6 years, in each community.

Other Provincial Ministries

At the provincial level, key partners within government include the Ministry of Education, which has established the Early Childhood Learning Agency, an organization exploring expansion of early learning programs. Other ministries with a role in early childhood development include the Ministry of Housing and Social Development, Ministry of Aboriginal Relations and Reconciliation, Ministry of Environment, Ministry of Attorney General, Ministry of Public Safety and Solicitor General, and the Ministry of Advanced Education and Labour Market Development.

2.2.3 Provincial Health Services Authority Roles and Responsibilities

The Provincial Health Services Authority (PHSA) is responsible for ensuring that high-quality specialized services and programs are coordinated and delivered within the regional health authorities. PHSA operates eight provincial agencies including: BC Mental Health and Addiction Services, BC Children's Hospital, BC Women's Hospital & Health Centre, BC Centre for Disease Control, BC Cancer Agency, BC Renal Agency, BC Transplant and Cardiac Services BC.

One of PHSA's four key strategic directions is population and public health. A steering committee consisting of representation from all PHSA agencies and programs oversees population and public health activity across PHSA. Due to the provincial scope of PHSA's mandate, a dual role for PHSA is emerging: improvements aimed at streamlining population and public health activities within PHSA agencies and programs, as well as potential provincial coordination in areas such as surveillance, consistent messaging, expert advice, and supporting development of healthy public policy.

With respect to infant and early childhood health and development, PHSA's role encompasses a wide range of services and supports:

- The Centre for Community Child Health Research works to improve the health and well-being of children and their families by understanding the determinants of health and applying this knowledge to community-focused prevention, intervention and health promotion. It is linked to the Child and Family Research Institute at the University of British Columbia (UBC), which conducts research to advance knowledge and care related to children's health.

- BC Early Hearing Program provides, through the regional health authorities, screening to check hearing ability in babies.

- The BC Autism Assessment Network (BCAAN) is responsible for assessing and diagnosing children who may have autism, through services provided by regional health authorities (BCAAN ensures standards and guidelines are met).

- BC Mental Health and Addiction Services oversees the delivery of a number of specialized child and youth mental health services.

- BC Women's Hospital and Health Centre provides a number of specialized programs including the Oak Tree Clinic, which offers HIV care for infected women, children and

youth, and support services for affected families; the Fir Square Combined Care Unit delivers specialized care for substance-exposed babies. The BC Perinatal Health Program works to optimize maternal and neonatal health throughout the BC through four key strategies: knowledge transfer and practice support, health promotion and disease prevention, surveillance and data collection.

2.2.4 Other Provincial Agencies Roles and Responsibilities

There are also many other organizations at the provincial level that are active in supporting healthy infant and child development. These include:

- Child Health BC, a network that links the province's health authorities, PHSA, health professionals and care facilities through a collaborative approach to improve services and resources, including development of guidelines, delivery of workshops and provision of other resources.
- The BC Healthy Child Development Alliance, a coalition of about 40 health, social, education, research and community organizations focuses on strengthening healthy early childhood development.
- The British Columbia Council for Families provides parent resources, training, research and a website.
- The BC Baby-Friendly Network, a multidisciplinary committee focuses on protecting, promoting and supporting breastfeeding.
- The Human Early Learning Partnership, a multidisciplinary research institute that involves BC's four major universities.
- Colleges and universities in the province play an important role in educating and training child care workers, nurses, physicians, nutritionists and other health care professionals who provide early childhood development services.
- Other groups include the UBC BC Injury Research and Prevention Unit, the public health professional practice councils, and many non-governmental organizations and private sector groups who work to enhance children's health and development.

2.3 Health Authorities Roles and Responsibilities

The role of health authorities is to identify and assess the health needs in the region, to deliver health services (excluding physician services and BC Pharmacare) to British Columbians in an efficient, appropriate, equitable and effective manner, and to monitor and evaluate the services it provides.

In the area of healthy infant and child development, it should be noted that many factors that impact early childhood development may be outside the direct control of health authorities; thus the role of the health authority includes a number of strategies intended to influence partners and

other sectors to support healthy childhood development. Key roles of the health authorities are summarized below (Section 5.0 provides a more complete description).

- Leadership and Advocacy
    - Coordinating the development and implementation of a long-term comprehensive, multi-sectoral strategy.
    - Identifying key policies and processes for managing the healthy infant and child development functions.
    - Advocating for healthy public policies at the regional, provincial and federal levels for early childhood development priorities, in collaboration with partners and stakeholders.
- Health promotion
    - Enhancing public awareness about healthy infant and child development.
    - Facilitating and collaborating with partners and stakeholders, through community development and community capacity building, to strengthen local services and supports for early childhood development.
- Prevention initiatives and early identification of risk or vulnerability
    - Universal interventions such as ongoing health education, advice and support for parents/caregivers, infants, toddlers and young children through well-child clinics, immunization clinics and groups sessions.
    - Identifying vulnerabilities and risks through developmental surveillance, eliciting parent concerns, observation, and use of a validated risk assessment tool (as necessary).
    - Targeted interventions for at-risk and vulnerable children and their families (in collaboration with other health professionals, partner agencies and other ministries as appropriate).
    - Health protection activities related to maintaining safe food and water as well as licensing of child care facilities and promoting healthy built environments.
- Surveillance and monitoring
    - Gathering and analyzing information to identify trends, issues and community risk factors for program planning and evaluation.
    - Developing an information system to integrate data on early childhood development.
    - Conducting program evaluation.

2.4 Local Roles and Responsibilities

Local governments exert important influence on policy and bylaws for "child-friendly" initiatives in areas such as public and community health, housing, social services, community safety, recreational services and environmental health. As well, many communities have an inter-sectoral early years group, and community organizations provide many services that offer important local access to health support for families with infants and young children.

2.5 Aboriginal Communities

Also on a community level, it is important that Aboriginal groups have full involvement in the planning and delivery of early childhood health and development programs to families on First Nations reserves as well as Aboriginal families in other communities. Capacity building and partnership with Aboriginal communities can strengthen and support the shift toward self governance of the health care system and facilitate the management, planning and delivery of Aboriginal services.

On a provincial level, through the signing of the Transformative Change Accord, the Leadership Council representing the First Nations of British Columbia, the Province of British Columbia and the federal government have agreed to a shared commitment to action on closing health, social and economic gaps between First Nations and other British Columbians. Further work has taken place to develop action plans to close health gaps by 2015. The success of these initiatives will require, in part, ongoing collaboration among various levels of government.

2.6 Legislation and Policy Direction

The overall legislative and policy direction for healthy infant and early childhood development is derived from:

- The following acts and regulations: *Public Health Act, Infants Act, Community Care and Assisted Living Act,* and the *Community Services Act.*
- *A Framework for Core Functions in Public Health* (March 2005).
- ActNow BC policies approved by the Ministry of Healthy Living and Sport.
- WHO/UNICEF Baby-Friendly Initiative
- The United Nations Convention on the Rights of the Child.
- The Transformative Change Accord: First Nations Health Plan.
- Children and Youth with Special Needs Framework for Action.
- Specific policies/priorities that may be established by the health authority, the Ministry of Healthy Living and Sport or the provincial government.

3.0 GOALS AND OBJECTIVES

The goal of the program for healthy infant and child development is to maximize the healthy physical, emotional and social development of infants and children in BC, from 7 days to 5 years of age (up to the 6th birthday). The specific objectives are to:

- Protect, support and enhance infant and child physical health, emotional health, intellectual and cognitive ability, social knowledge and competence, and language and communication skills.
- Increase systemic support for promoting and maintaining healthy environments and healthy early childhood development at the family, community, school and regional levels.
- Enhance the early identification of infants and children living in conditions of risk.
- Prevent or reduce vulnerabilities and risks that represent a threat to the healthy development of infants and children, including the prevention of disease, disability and injury.
- Reduce the health disparities and gaps experienced by vulnerable populations of children.

4.0 PRINCIPLES/FUNDAMENTAL CONCEPTS

Principles and fundamental concepts for a model health authority prevention program for healthy infant and child development are

- A comprehensive and integrated approach using a wide range of strategies.
- Multi-sectoral and multi-disciplinary collaboration, through strengthened partnerships across sectors, issues and levels.
- A population health approach, which takes into account social, economic and environmental determinants of health, including protective factors, risk factors and vulnerable populations.
- Promotion of health and well-being to enhance positive outcomes through broad-based programs at a population level, including empowerment of children, parents, families and communities through information, opportunities, skills and resources.
- A focus on prevention, early identification and early intervention of infant and childhood developmental problems.
- A combination of universal interventions for all infants, young children and their families, as well as selective, targeted interventions for families living in conditions of risk and vulnerable populations.
- Responsiveness to local needs and specific vulnerable populations such as teen mothers, Aboriginal people, immigrant, refugees and diverse cultural groups.
- Accessible services provided in a flexible, respectful manner.
- Leadership, long-term planning and sustainable measures over time.
- Advocacy for strengthened policies and use of best or promising practices by local and regional partners.
- A culture of evidence-based practice, evaluation and continuous quality improvement.

Some of these key principles or fundamental approaches considered by experts in the field to be essential in achieving progress and successful outcomes are described more fully in the following section.

4.1 Multi-Disciplinary/Multi-Sectoral Collaboration and Integration

Collaboration and partnerships in infant and child health and development across a wide range of health programs is necessary to ensure consistent, seamless services, and to build upon, supplement, expand and strengthen initiatives. Some circumstances also require the integration of program delivery strategies to effectively address the interrelatedness of social problems, physical illness and mental health issues. Such situations demand integrated public health policies that target clusters of related problems, common determinants and populations at multiple risk (WHO, 2004). Integration can also facilitate the delivery of a continuum of programs, such as reproductive health, healthy infant and child development and healthy children and youth development.

The following partners are essential for successful delivery of healthy infant and child health and development initiatives:

- *Public health functions*, specifically: Integrated planning and coordinated program delivery will be required with the following core programs:
    - Reproductive health and prevention of disabilities.
    - Healthy living (healthy eating/weights, physical activity and tobacco cessation).
    - Prevention of harm associated with substances (alcohol, tobacco and illicit drug use).
    - Prevention and control of communicable diseases.
    - Mental health promotion and mental disorder prevention.
    - Dental public health.
    - Prevention of violence and abuse.
    - Prevention and control of chronic diseases.
    - Prevention of unintentional injuries.
    - Healthy communities (healthy municipalities, health care facilities, workplaces and schools).
    - Air quality, water quality and healthy community environments.
    - Food security and safety.
- *Community partners*
    - Collaboration with community stakeholders is not only important for addressing and responding effectively to local needs, but also to establish key partnerships for program delivery. These local organizations and agencies may include local governments, family support services, family resource

programs, social services, Aboriginal Friendship Centres, child care agencies, planned parenthood groups, women's centres, transition houses, mental health agencies, recreation and sports programs, multicultural and immigrant agencies, Aboriginal groups and community food committees.

- *Multidisciplinary health care providers*
    - Collaboration by a range of health care providers is important to highlight the preventive health care role in partnership with public health. These partners include primary care practitioners, acute care practitioners, neonatologists, pediatricians, nurses, nutritionists, speech therapists, dental care professionals, infant development program specialists, other health care providers and other specialized practitioners.
- *Other provincial ministries and agencies*
    - Ministry of Children and Family Development (community-based interventions for children with special needs including autism disorders, FASD, developmental delays, mental health services, Aboriginal Head Start, and support for child care services).
    - Ministry of Education (early learning support services).
    - Ministry of Housing and Social Development, and Ministry of Public Safety and Solicitor General.
    - Health professionals in PHSA (expertise, training, and support in best practices, standards and guidelines).
    - Child Health BC, a network linking the province's health authorities, health professionals and care facilities through a collaborative approach.

4.2 A Population Health and Determinants of Health Approach

Population health is an approach to health that aims to improve the health of the entire population and to reduce health inequities among population groups. This broad approach to health recognizes that at every stage of life, health is determined by complex interactions between biological, social, economic and environmental factors that contribute to health and healthy infant and child development. Determinants of health and related risk and protective factors within the regional population need to be taken into account in developing meaningful needs assessment, priorities and program plans.

General determinants of health widely recognized by the Public Health Agency of Canada acknowledge the importance of healthy child development and also recognize that it is influenced by other key determinants such as income and social status, education and literacy, and social support networks. While there are no widely accepted determinants of child health, the factors considered by a number of experts (Hertzman et al., 2004; Payton et al., 2000; WHO, 2002), to be important influences in early childhood development are:

- Socio-economic status (e.g., family income and parent education levels).
- Parenting style.
- Attachment.
- Family structure and social relationships.
- Social and emotional learning.
- Cognitive stimulation (and conversely, social isolation, neglect, abuse and violence).
- Neighbourhood safety, cohesion and socio-economic character.
- Physical characteristics including genetic makeup, hearing, vision and speech abilities.
- Access to quality child care and developmental opportunities.
- Gender, race and ethnicity.
- Environmental conditions (e.g., living close to hazardous waste sites or smelters).
- Food security.

There are complex interactions between protective and risk factors and their influence on either disease risk or opportunities for individual and population health. It is clear that the determinants play a major role, not only in child health but in lifelong health, learning and behaviour; for example, chronic diseases in adult years have recently been linked to childhood risk factors (Ontario Health Promotion E-Bulletin, 2009). Some risk factors, such as physical characteristics and genetic makeup, cannot be altered. Others, such as low literacy, exposure to violence and trauma or lack of social support, can be changed through strategic interventions (McEwan, Waddell, & Barker, 2007). Protective factors, which can reside in individuals, families and communities, reduce the likelihood of negative outcomes; for example, positive stimulation along with affectionate and stable care facilitates a child's development of trust, self-esteem and positive relationships (Payton et al., 2000). Social and emotional health and social inclusion contribute to resiliency and the ability to cope with adversity and deal effectively with the demands and stresses of life. Conversely, children who experience abuse, neglect or violence are more likely to develop behavioural and mental disorders, either in childhood or later in life (Mangham, Reid, & Stewart, 1996). Protective factors may prevent the initial occurrence of risk factors, work directly to decrease dysfunction, interact with risk factors to buffer their effects, and/or disrupt the pathways whereby risk leads to poor development (Coie et al., 1993).

The linkage between determinants of health is highlighted in Appendix 3. This appendix highlights not only the key role played by determinants but also demonstrates how the specific program components presented in this paper are intended to address each determinant. It also refers to research-based evidence for the respective interventions and notes other core public health programs which address these issues.

4.3 Support Across the Continuum of Growth and Key Transition Points

A developmental pathways approach acknowledges the protective and risk factors that occur across the continuum of growth and at key transition points. Recognition is given to the foundational importance of a healthy start in the early years and its importance in health later in life. The continuum of early childhood development highlights the different stages and thus addresses the vulnerable points that may occur at key transition points between states, for example, developmental transitions such as movement from sitting to crawling and to walking, or social transitions such as movement to group interactions, to school, etc.

The key stages are:

- Infancy (0 to 1 year).
- Toddlers (1 to 3 years).
- Pre-school (ages 3 to 5 years).

4.4 Universal and Targeted Initiatives

A combination of universal and targeted initiatives is necessary. Universal initiatives are required when broad-based measures have been shown to be necessary and effective for the population as a whole (e.g., promotion of breastfeeding, well-baby clinics, immunization clinics, promotion of positive parenting practices and healthy infant attachment, vision screening and newborn hearing screening).

Targeted initiatives are required for specific groups that are considered vulnerable, including parents and children with certain characteristics that place them at risk of behavioural, social or cognitive problems (e.g., preterm and low-birth weight infants have a number of developmental risks). A validated screening tool (e.g., the Parkyn tool) can assist in determining at-risk families and children by identifying specific risk factors such as those related to socio-economic status, parental education, physical characteristics, race and ethnicity, etc.

As well, the use of a range of population "lenses" is important to assist in identifying vulnerable groups. A gender equity lens can identify specific risks that are unique to the experiences of young girls and their mothers. Diversity equity lenses are necessary to examine population groups that are at higher risk, or are more vulnerable to problems due to a wider range of biological, social, cultural and other factors. Depending on the vulnerabilities of each population, tailored measures are necessary to overcome the specific barriers and inequities they experience.

4.5 Support for Diverse Groups

4.5.1 Aboriginal Children and Families

Aboriginal people have a high number of risk factors, compared to the general population, that can impact healthy infant and child development. European-introduced diseases, shifts in diet, colonization, reserves and residential schools have all contributed to the disruption of Aboriginal cultures, communities and family structures.

It is important that Aboriginal groups are fully involved in designing and delivering early childhood health and development programs to families on First Nation reserves as well as to Aboriginal families in other communities. Rather than being integrated into mainstream programs, these initiatives should parallel health promotion and illness prevention programs that are culturally sensitive and situated within an Aboriginal worldview, in order to sustain long-term, community-based change (Mussell, Cardiff, & White, 2004). Since little evidence was found on effective programs for Aboriginal children, except for the successful Aboriginal Head Start program, researchers suggest that programs draw from multicultural approaches and support inclusion, mutual respect and holism. Aboriginal people must be full partners in the design and delivery of health initiatives to benefit them and their communities (Transformative Change Accord, 2005). Services should be community-based (with Aboriginal providers wherever possible) supporting cultural relevance and decision-making. Of vital importance is investment in programs that help prepare Aboriginal young people for parenthood, thus promoting a stimulating, safe environment for infants and young children (Keating & Hertzman, 1999).

4.5.2 Multicultural, Immigrant and Visible Minority Groups

In multicultural Canada, some persons or groups may face additional health risks due to conditions such as marginalization, stigmatization, loss or devaluation of language and culture experience with violence and trauma, and lack of access to culturally appropriate health care services. Appropriate support services are required to address a variety of differing cultural practices, risk factors and needs that are unique to the many immigrant and refugee populations in the province. For example, a systematic review of 10 studies with more than 15,000 respondents from diverse racial groups in North America found a clear association between experiences of racism and psychological distress (Williams & Williams-Morris, 2000).

4.5.3 Children in Care

Children in care, through the Ministry of Children and Family Development (MCFD), face significant, often systemic issues, as a result of being placed in many different foster homes, being reunited with their biological family and/or being removed again from the biological family. This may involve being placed in different parts of the province, having different health care providers and little consistent, coordinated health care. It is important that health care services for this group of children be coordinated and aligned with MCFD policies and programs so that the health authorities and health care providers can ensure a consistent approach, necessary care and follow-up.

4.5.4 Other Vulnerable Groups

A range of other issues may cause vulnerabilities for infants, young children and their families. For example, vulnerability may result from physical disabilities, developmental problems or health issues that predispose the child to chronic diseases; the presence of violence and abuse, experiences of trauma or substance use in the home can create risks for healthy early childhood development and require additional health and social supports for those struggling with these issues; low-income families may face significant challenges from the pressures of providing a healthy environment and nutritious food; and, lesbian, gay and transgendered people who are

parents of young children may be exposed to additional stress due to discrimination and may face unique challenges in finding a supportive health care provider.

It is important to recognize the unique needs of infants and children with ongoing developmental delays or chronic illnesses. The Child and Youth with Special Needs Framework for Action provides a foundation to support a coordinated, collaborative approach across sectors involved in care provision for infants and children with special needs.

5.0 MAIN COMPONENTS AND SUPPORTING EVIDENCE

5.1 Introduction

The major program components for healthy infant and child development in regional health authorities are

- Leadership and Advocacy.
- Health Promotion.
- Prevention Initiatives and Early Identification of Risk or Vulnerability.
- Surveillance and Monitoring.

As discussed in Section 4.2, many factors impact early childhood development that are outside the direct control of health authorities. As a result, the role of the health authorities includes a range of strategies such as advocacy, building partnerships and community development intended to influence partners and other sectors to enhance early childhood development. For example:

- Areas in which the health authority has considerable control include immunization coverage, promotion and support of breastfeeding practices, hearing assessment and follow-up, etc.
- Factors such as parenting skills and healthy nutrition can be influenced through health promotion activities and strong collaborative partnerships with health care practitioners, as well as through advocacy and community development.
- Other areas such as income and education levels, housing conditions, and access to child day care programs are outside the authority of the health authority and can only be influenced through advocacy measures directed to decision-makers in other organizations.

Strategies for each of the main program components are described in the following sections.

5.2 Leadership and Advocacy

Health authorities need to promote, facilitate and enhance early childhood development strategies within the organization, and engage in collaborative approaches with other partners and stakeholders to enhance initiatives across the region. This should include:

- Collaborating in the development and implementation of a long-term, comprehensive, multi-sectoral strategy, including identification of regional and community priorities. This involves
    - Consultation with health partners and other stakeholders in early childhood health and development.
    - Early childhood needs assessment, including the influence of the determinants of health, vulnerable populations in the region, and the interplay between existing strengths, protective factors and risk factors.

  - Identification of evidence-based strategies with the greatest potential for positive outcomes (e.g., based on consultation with the Ministry of Healthy Living and Sport, Ministry of Children and Family Development, Ministry of Education and PHSA, the review of emerging research, as well as information from professional associations and experts in the field).

  - Analysis of intervention costs and potential cost benefits.

- Collaborating in the design and promotion of other related core public health programs to enhance and coordinate widespread responsiveness and support for healthy early childhood development.

- Identifying key policies and processes for effective management of the healthy infant and child development program, including an organizational structure or arrangement to manage and deliver early childhood development initiatives and to collaborate/partner with other health authority programs and with community-based organizations.

- Advocating for healthy public policies, in collaboration with partners and stakeholders, on regional child development priorities, such as:

  - Strategies to address inequities in social, economic, cultural and environmental conditions that impact on healthy early childhood development, such as advocacy for children in care, the need for healthy built environments, safe and stable housing, safe neighbourhoods, anti-poverty measures, prevention of discrimination, etc.

  - Creation of breastfeeding-friendly environments and communities as a public health strategy to promote breastfeeding and support breastfeeding mothers.

  - Enhanced access to quality child care services including comprehensive programs to address the needs of high-risk children and their parents.

  - Healthy living strategies that support healthy nutritional practices for families and children, physical activities for children, and involvement in sports and recreation programs.

  - Local food security programs that promote community initiatives to address food insecurity such as community gardens, farmer's markets, community kitchens, etc.

5.2.1 Summary of Supporting Evidence

Fundamental public health tasks that are essential to establish and maintain the capacity of the system to carry out its core programs or services include planning and managing programs, undertaking research, performing policy analysis and developing policies, and working in and with communities to strengthen community capacity (United Kingdom Department of Health, 2001).

The advocacy role for public health is well-accepted and key in seminal health promotion frameworks such as the WHO's Ottawa Charter. The Public Health Agency of Canada identifies advocacy as a core competency of public health and notes that it is important to "advocate for healthy public policies and services that promote the health and well-being of individuals and communities" (PHAC, 2008).

The WHO, in the Ottawa Charter (1986), also recommends "building healthy public policy" as a central activity in effective health promotion. Those societies that have reduced health inequities to the greatest degree have high-quality early child development arrangements, universal access to quality child care, and careful attention to neighbourhoods and the socio-economic niches within neighbourhoods where children grow up (WHO, 2006). With respect to advocacy for specific early childhood development policies and programs, research has shown that:

- Child care settings are an important venue to influence child and parental health (MOH, PHW, 2007a). For young children from low-income families, participation in very high-quality, centre-based, early education programs has been demonstrated to enhance child cognitive and social development (Harvard University, 2007).

- Increased food security is necessary to reduce problems associated with inadequate food and undiagnosed micronutrient deficiencies—inadequate nutrition during early childhood may lead to permanent cognitive damage, or problems such as aggression, anxiety and irritability (Alaimo, Olson, & Frongillo, 2002). In the long term, it is associated with obesity and vulnerability to diabetes and a number of chronic diseases (Nelson et al., 2001; Vozoris & Tarasuch, 2003).

- Physical activity has positive effects on growth and maturation in children generally (Malina, 1994). Children who are regularly physically active also tend to experience attitude and behavioural improvements (Irwin, He, Sangster Bouck, Tucker, & Pollett, 2005).

- For families living in poverty, work-based income supplements for working parents have been demonstrated to boost the achievement of some young children (Harvard University, 2007.

5.3 Health Promotion

Health promotion to enhance and support healthy infant and child development should include

- Increasing public education, awareness and social marketing through collaboration with health care and community partners:

    - Provide information resources and tools to increase awareness of the importance of healthy infant and child development and the range of programs available.

    - Focus public information on strengthening protective factors such as promotion of positive parenting skills, attachment and caring support, healthy eating, cognitive stimulation, healthy built environments, etc.

- Target information and resources to strengthen the skills of specific vulnerable groups through health literacy principles and tailored information reflecting their respective needs, culture, language ability, etc. (e.g., single teenage mothers, immigrant and refugee populations, etc.).
- Offer information through telephone consultation.

- Facilitating community development and community capacity building
  - In partnership with key stakeholders (e.g., community organizations, infant and child groups, community health champions and health educators), assess local needs, identify vulnerable populations, determine priorities and resources, and develop and implement community plans.
  - Facilitate and encourage coordination and collaboration among primary care and acute care health providers, public health professionals, dental hygienists, occupational and physical therapists, speech therapists, nutritionists, social service agencies, and other allied professionals working with infants and young children.
  - Provide information, data, research on best and promising practices, technical advice and other assistance to support communities in planning and developing local health promotion strategies.
  - Support and assist Aboriginal communities and organizations in planning and implementing health promotion programs for healthy infant and early childhood development programs in their communities.
- Reorienting health services
  - Encourage and promote increased emphasis on, and integration of, health promotion for healthy infant and child development by health care providers, including family practitioners, pediatricians, nurses and others.

NOTE: These activities should be implemented in conjunction with local initiatives for core programs for reproductive health, healthy communities, healthy living, dental health, mental health promotion and mental disorder prevention, prevention of violence, abuse and neglect, and food security, so that local initiatives are coordinated and integrated into existing networks among community stakeholders.

5.3.1 Summary of Supporting Evidence

The WHO states, in the Ottawa Charter for Health Promotion (1986), that

> The focus of health promotion should be on strategies focused on communities, groups and individuals which include: creating physical and social environments supportive of health, strengthening communities' capacity to address health issues of importance to them, and to mutually support their members in improving their health, helping people to develop the skills they need to make healthy life choices

> and to care for themselves and their families, and where necessary, re-orient health services to support health promotion, healthy protection and the prevention of disease, disability and injury.

More specifically, the pillars of the Ottawa Charter are healthy public policy, supportive environments, personal skills, strengthened community action and reoriented health services.

Interventions that are believed to maximize success of community development and community capacity building include strategies that promote behavioural change, are specific and tailored to the community that is being targeted, involve the community in the development of the strategy and dedicate sufficient resources to undertake a rigorous evaluation. Networking across settings is necessary to strengthen the integration of priorities and initiatives and to supplement and strengthen their overall impacts (MOH, PHW, 2007c). The literature suggests that the weight of evidence confirms that multi-component or comprehensive interventions have a higher effectiveness and cost-effectiveness compared to those programs that focus on a single component (MOH, PHW, 2006).

5.4 Prevention Initiatives and Early Identification of Risk or Vulnerability

Infants (Aged 0 to 1 Year)

Universal Programs

- Proactively supporting breastfeeding exclusively for a 6-month period (with continuation for 2 years and beyond combined with quality food), through ongoing encouragement and guidance by peer counsellors and health professionals (reproductive health core program).
- Providing ongoing health education, advice and support for infants and new parents through well-baby clinics, immunization clinics, group sessions and home visits for new parents, to enhance parenting skills and encourage healthy infant development and injury prevention.

Infant Risk Identification

- Identifying vulnerabilities and risks during well-baby clinics and/or home visits in the following areas:
    - Infant and child feeding and nutritional practices.
    - Developmental delays.
    - Dental health.
    - Infant and child emotional health.
    - Parenting/caregiver skill and capacity.
    - Parental health (e.g., perinatal depression, chronic diseases, HIV/Aids, etc.).

  - Exposure to second-hand smoke.
  - Risks related to family structure, socio-economic conditions, neighbourhood character, environment and culture.

- Ongoing identification of parental risk factors through the gradual building of trust, and referral to appropriate supports as necessary, related to:
  - Intimate partner violence and abuse.
  - Alcohol and problematic substance use.
  - Parental mental health disorders.
  - Poverty, education, and/or isolation.
- Promoting and supporting infant screening by family practitioners and specialized health providers for a full range of disorders and defects using standardized tools/tests, including hearing screening.
- Conducting risk assessment of infants for specific social, economic and environmental risk factors using a validated risk screening tool (as noted in reproductive health core program).

Targeted Interventions for At-Risk Infants

Interventions should be tailored to specific needs, and where appropriate integrated with related core public health programs:

- Coordinating early intervention, education and follow-up with parents/caregivers of preterm and low birth weight infants, and / or disabling conditions, including clinic-based and/or home visits to positively influence growth and development (reproductive health core program).
- Providing parenting skill development and parenting/caregiver support, where needed, through "multi-modal" programs involving a range of strategies such as group sessions, written information/instructions and home visits.
- Providing education and ongoing support to foster parents and other caregivers of children-in-care to promote and encourage healthy child growth and development.
- Collaborating with partners to provide teenage parenting programs to enhance teen parenting skills and support development of life skills and healthy lifestyles.
- For high-risk families, providing regular, intensive interventions incorporating social learning principles, to build parental acceptance and responsiveness to their child, foster positive attachment, build infant security and decrease child neglect and abuse (mental health promotion and mental disorder prevention core program).

- Providing nutritional counselling where necessary, including individual counselling to improve parental/caregiver practices in child nutrition and feeding, including advice and assistance in accessing community resources for families lacking food security.
- Refer infants to specialized programs or practitioners where indicated.
- Early intervention for children with speech and language delay and/or hearing impairment may be provided by health authorities.

Toddlers (Ages 1–3 Years)

Universal Programs

- Providing ongoing health advice, education and support for toddlers and their families/caregivers through well-child clinics, immunization clinics and group sessions to enhance parent's/caregiver's knowledge and skills and to promote healthy early childhood development and injury prevention.
- Collaborating with partners in promoting and supporting key behaviours to enhance parent/caregiver and child healthy eating practices, physical activity and other key protective measures, through multiple settings such as child care programs, early learning programs and family support agencies.
- Promoting and supporting daily reading/storytelling to young children to support speech and language development.
- Promoting positive communication skills and positive parent/caregiver behaviours to encourage and enhance communication, social learning and positive child behaviours.

Risk Identification

- Ongoing risk identification and developmental surveillance during well-child clinics, group sessions and home visits to identify vulnerable toddlers, including
    - Recognize abnormal appearance and functions through informed observation of a child's development, including the failure to achieve developmental milestones.
    - Elicit parental concerns about development, using a standardized parent questionnaire when appropriate, in combination with a validated developmental screening instrument, where indicated.
    - Identify issues related to child feeding and nutritional practices, physical activity levels, dental health, child emotional health, parenting skill and capacity, exposure to second-hand smoke, as well as risks related to socio-economic status, neighbourhood character, environment and culture.

- Ongoing identification of parental/caregiver risk factors through the gradual building of trust, including intimate partner violence and abuse, alcohol and problematic substance use, parental mental health disorders, and poverty and isolation.
- Assessing specific risk factors using a validated risk assessment tool, as appropriate.

Targeted Interventions for At-Risk Toddlers

Targeted interventions for specific children and families, and for neighbourhoods or communities that have been identified as vulnerable, such as:

- Coordinating linkages with community-based resources and referring children who have been identified with potential developmental problems and disorders to specialized health professionals.
- Providing regular, intensive interventions for high-risk children including home visits, and small group sessions, to build parenting skills, foster positive relationships and behaviours, and decrease child neglect and abuse (mental health promotion and mental disorder prevention core program).
- Providing nutritional education and advice, including individual counselling where necessary, for parents/caregivers of children with nutritional disorders or growth disturbances, including overweight and obesity, as well as advice and referral for food-insecure families.
- Referring children to specialized programs or practitioners where indicated. For example:
    - Refer children with speech and language delays to a speech/language expert for assessment and specialized interventions.
    - Refer children with identified physical or developmental delays for specialized assessment and interventions.
    - Refer special needs children to MCFD and other partners for assessment and early intervention.
- Collaborating with MCFD and community agencies to enhance access to day care prevention initiatives, as a supplement to home visits for additional support in enhancing protective factors (mental health promotion and mental disorder prevention core program).

Preschool Children (Ages 3–5 Years)

Universal Prevention Programs

- Providing ongoing health education, advice and support for preschool children and their families through well-child, immunization clinics and group sessions to promote healthy childhood development.

- Collaborating with partners in promoting and supporting key protective behaviours to enhance parent-child healthy eating practices, physical activity, and healthy social, emotional and cognitive development through multiple settings, such as child care programs, early learning programs and family support agencies (e.g., promote and support daily reading/storytelling to young children to support speech and language development).

Risk Identification

- Ongoing risk identification and developmental surveillance through informed observation during well-child clinics, group sessions and home visits, and referrals from partners, to identify vulnerable preschoolers (e.g., child feeding and nutritional practices, physical activity levels, dental health, child emotional and cognitive development, parenting skill and capacity, exposure to second-hand smoke, and other risks related to socio-economic issues, neighbourhood character, environment, and/or culture, etc.).
- Ongoing identification of parental/caregiver risk factors through the gradual building of trust, including intimate partner violence and abuse, alcohol and problematic substance use, parental mental health disorders, and poverty and isolation.
- Vision screening for children before age 5.
- Assessing dental risks (ranging from surveying to screening) of young children (dental health core program).
- Assessing specific risk factors using a validated risk screening tool, as appropriate.

Targeted Interventions for At-Risk Preschool Children

Provide targeted interventions for specific children and families, and for neighbourhoods or communities that have been identified as vulnerable, including:

- Providing regular, intensive interventions through home visits to enhance parenting skills, reinforce positive relationships and behaviours and strengthen other protective factors (mental health promotion and mental disorder prevention core program).
- Supplementing home visits through collaborative preschool/day care prevention initiatives to enhance social, emotional and cognitive development (mental health promotion and mental disorder prevention core program).
- Working with community agencies and MCFD to enhance availability and capacity of non-parental day care programs for children at risk, with comprehensive programs of language, cognitive, perceptual-motor and social development.
- Addressing nutritional disorders, failure to thrive, growth disturbances (including overweight and obesity) through individual or group sessions, clinic-based and/or home visiting interventions as appropriate.

- Assisting families in accessing community resources for additional advice, treatment and support.

Other Interventions for Infants and Children

Targeted environmental health interventions including:

- Encouraging tobacco cessation and prevention of exposure to environmental tobacco smoke in homes with young children, through a coordinated approach with tobacco cessation health professionals.
- Collaborating with environmental health officers in monitoring child asthma and respiratory diseases and identifying measures to reduce children's exposure to air pollution.
- Conducting lead exposure screening for high-risk children and providing follow-up interventions where lead levels are found to be at unacceptable levels.

5.4.1 Summary of Supporting Evidence

Exclusive breastfeeding for six months is recommended by the WHO, and Canadian and American guidelines. Evidence has shown that breastfeeding is associated with prevention of health problems in children and later in life, and reduces the risk of behavioural and mental health problems.

Research has found that a range of programs are needed, as no single program approach or mode of service delivery has been shown to be a "magic bullet" (Harvard University, 2007). Home visiting has shown benefits, with the most evident and substantial benefits among children with identified problems and families where the need is greatest (e.g., high-risk, first-time parents, low birth weight, special needs, injuries, behavioural issues, child IQ, alcohol/drug use, etc.). The most well-documented randomized controlled trials on home visiting focused on high-risk, first-time pregnant and parenting mothers and demonstrated positive intervention effects related to key factors such as birth weight, behavioural issues, child IQ, maternal return to school, employment, etc (O'Brien, 2005). For the general population of children and parents, the evidence on home visiting programs indicates that most programs produce benefits that are modest in magnitude (Gomby, 2005).

Parent education and support programs are effective in creating positive changes in children's behaviour as well as changes in parents' behaviour and relationships with their children. The evidence also indicates that "intensity matters"; i.e., the more issues a family presents, the more a multi-modal program in required (Hume, Hubberstey, C., & Rutman, 2005). Successful parenting programs share a number of characteristics discussed in the core programs evidence review on healthy infant and child development (MOH, PHW, 2007a). A number of effective preventive interventions have been found to enhance child emotional health including development of parent skills to build healthy infant/child emotional development and secure attachment (Bakermans-Kranenburg, Van Ijzendoom, M.H., & Juffer, 2003). "Positive" or "authoritative" parenting styles have been shown to be the most beneficial to children (i.e.,

where parents/caregivers monitor behaviour, set limits, are warm, nurturing and responsive to children's needs, and encourage independence) (Munro, 2009). Programs that teach parents to share books with their children in a way that is child-centred and interactive have been the most effective in motivating children to read; specifically reading aloud to very young children increases both expressive and receptive language skills in toddlers and verbal performance in elementary school (DeBaryshe, 1993; Scarborough, 1991). The toddler stage is an optimal time to learn communication skills and positive socio-emotional behaviours through imitation of adult modeling and behaviours (Brownell & Kopp, 2007).

A number of researchers have studied the characteristics of effective preschool prevention programs, for example, Hertzman (WHO, 2006) notes that randomized trials show that early childhood intervention with the strongest effects on improving children's development have a fairly long duration, ensure a nurturing social and emotional environment, and are rich in and responsive to language use (Nelson, Westhues, & MacLeod, 2003). In addition, Norman, Normand, Vitaro, and Charlebois (2000) found that many studies demonstrated that programs are more successful over the long term if they involve the parents, begin early in the child's life and address multiple risk factors. They suggest a range of strategies/measures aimed at maximizing efforts to facilitate the active participation of parents. A Harvard study also found that, for children in families experiencing significant adversity, two-generation programs that simultaneously provide direct support for parents and high-quality, centre-based care and education for children can have positive impacts on both (Normand et al., 2000). As well, Gray and McCormick (2005) found in an systematic review that the successful programs are targeted to vulnerable children; employ centre-based, or combine mixed-centre-based with home visiting; are family focused and culturally competent.

Nutrition programs that are population-based and offered in multiple community-wide settings have the broadest reach for the lowest cost and are recommended for the general population (Daniels et al., 2005). Studies on preschool nutrition interventions for at-risk children have shown that nutrition programs need to focus on behavioural change strategies, rather than on information alone (Horodynski & Stommel, 2005). The core program evidence review on healthy infant and child development (MOH, PHW, 2007a) provides extensive information on effective nutrition interventions as well as evidence on interventions to address environmental issues that can impact early childhood health and development.

With respect to risk identification, researchers have found that systematically eliciting parental concerns about development is an important method of identifying infants and young children with development problems. Parental concerns about language, fine-motor, cognitive and emotional-behavioural development are highly predictive of true problems (Glascoe, 2000).

In addition, the American Academy of Neurology guidelines (2001) recommend developmental surveillance from infancy through school-age. The New York State Department of Health also emphasizes the importance of routine developmental surveillance and suggests the use of clinical clues and developmental milestones as signals for focused screening and in-depth assessment (McKay, Shannon, Vater, & Dworkin, 2006). The literature identifies inherent limitations in developmental screening tools, which has led to controversy regarding their use: they have limited ability to predict future functioning as good developmental screening tests have

sensitivities of 70 to 80 per cent, which leads to over-detection and under-detection (King & Glascoe, 2003). The Canadian Task Force on Preventive Health Care (1993) found there was insufficient evidence to include or exclude developmental screening tools (except for the DDST, which was found to be ineffective), although some Canadian research suggests that a standardized parent questionnaire in combination with an individual screening instrument increases the predictive accuracy of the screening process (Henderson & Meisels, 1994).

Identifying neighbourhoods/communities that have multiple risk factors for childhood developmental delays is important:

> when the results are combined for children from a given neighbourhood or community, we can easily see where the variations are that could be subject to interventions aimed at eliminating health inequalities and reducing vulnerability. It allows for strategic planning and helps recognize how families, neighbourhoods, and service agents can influence early child development (WHO, 2006).

5.5 Surveillance, Monitoring and Program Evaluation

Surveillance and monitoring enables health authorities to clarify the trends in infant and child health and development, and provide a basis for assessing needs, priorities and developing strategic plans. Initiatives include

- Gathering information on the health and development status of infants and children:
    - Apply existing data standards and key indicators for consistent data collection and health assessment.
    - Proactively gather data, for example, through collaboration with MCFD and the Ministry of Education to identify childhood vulnerabilities.
    - Gather existing information on socio-economic status, child health data and specific risk factors from Educational Development Instrument results, provincial surveys, Medical Service Plan records, Pharmacare records, and other accessible sources.
- Analyzing and interpreting data to identify local and regional trends, major issues, key risk factors, vulnerable groups and populations, to support effective planning and decision-making.
- Monitoring and evaluating the effectiveness of specific strategies including universal and targeted programs.
- Collaborating on development of an information system that records infant and child screening, assessments, and developmental progress, while also encouraging a joint approach with health care services and community partners to collaborate in consistent statistical data collection, data sharing and data management processes (reproductive health core program).

- Establishing program evaluation frameworks and conducting evaluations of new initiatives.

5.5.1 Summary of Supporting Evidence

Surveillance in early childhood is challenging as the population is dispersed and health care often comprises a joint effort between multiple providers and health/social programs; however, Hinman, Saarlas, and Ross (2004) propose that stakeholders promote integration of separate child health information systems within the context of ongoing national initiatives, develop business and policy cases for an integrated system, develop an agreement on standards for collecting and transferring information, and communicate the importance of an integrated system.

"It is recognized that although the performance of public health, and prevention programs in particular, is difficult to measure, it is nonetheless likely that we will be able to manage—and improve—core functions in public health if we can measure performance" (MOH, 2005). A prevention information system capable of telling us how well we are doing is necessary for this purpose. As well, the public has a right to expect that the public health sector, along with the rest of the health care system, is paying attention to the quality and effectiveness of the interventions it undertakes, and is working to improve that quality (MOH, 2005).

Appendix 3 is a matrix that depicts the strong relationship between the determinants of health and healthy infant and child development. This matrix is presented, both to reinforce the importance and interrelatedness of the health determinants, and to act as a tool or resource that might be used by health authorities as a framework in development of their performance improvement plans for this model core program.

6.0 BEST PRACTICES

Often, there is no one "best practice" that is agreed upon; rather, there are practices that may have been successful in other settings and should be considered by health authorities. The terms "promising practices" or "better practices" are often preferred to reflect the evolving and developmental nature of performance improvement.

The evidence review prepared to support the development of this core program paper provides a detailed discussion of best practices in the field. It provides detailed information on a comprehensive set of health promotion and disease prevention strategies to support healthy infant and child development, and can provide further guidance and advice on effective practices:

- *Core Public Health Prevention Functions: Early Childhood Health and Development, Evidence Paper* (2007), by J. Reiter, D. Leach, and K. Yarker-Edgar, for the Ministry of Health, Population Health and Wellness.

Additional information relating to healthy infant and child development is available in the following documents:

- *Planning for Parenting Education and Support in BC* (2009), prepared by C. Munro for the BC Parenting Vision Working Group.
- *A Science-Based Framework for Early Childhood Policy: Using Evidence to Improve Outcomes in Learning, Behaviour, and Health for Vulnerable Children* (2007), by Harvard University, Center on the Developing Child.
- *Evidence Review: Mental Health Promotion* (2007), by the Ministry of Health, Population Health and Wellness.
- *Evidence Review: Prevention of Mental Disorders* (2007), by the Ministry of Health, Population Health and Wellness.
- *Evidence Review: Dental Public Health* (2006), by the Ministry of Health, Population Health and Wellness.
- *A Review of the Science Underlying Preschool Vision Screening with Implications for BC* (2005), prepared by C. Green Health Information for the Ministry of Health.

7.0 INDICATORS, BENCHMARKS AND PERFORMANCE TARGETS

7.1 Introduction

It is important to define what one means by the terms *indicators*, *benchmarks*, and *performance targets*. An indicator is a summary measure (usually quantifiable) that denotes or reflects, directly or indirectly, variations and trends in, this case, infant and early child development. Indicators are more than outcome measures, they constitute an important reflection of some aspect of a given program or service, and their value is that they drive decision and action. Indicators need to be standard so that they can be compared across different organizational entities such as health regions. Benchmarks are reflective of "best" practices. They represent performance that health authorities should strive to achieve. Benchmarks are determined by reviewing the literature; reviewing the best practice experience in other jurisdictions; or by determining "consensus" opinion of leading experts and practitioners in the field. Performance targets are locally determined targets that represent a realistic and achievable improvement in performance for a local health authority.

This section presents a number of key indicators or performance measures for a program on healthy infant and early childhood development. Suggested benchmarks can apply across the province, while other benchmarks may need to be modified to account for key variables such as geographic size, or population density of the health authority.

One can develop indicators related to the inputs, activities, outputs and outcomes (immediate, intermediate or final) of each of the respective components of the program. Thus, it is not necessary to only have outcome-related indicators and benchmarks. Furthermore, indicators need to be understood within a broader context. For example, a low per-capita cost for a specific program could reflect on the efficiency and effectiveness of a given program, or reflect a program that is under-resourced. It is recognized that infant and early childhood development programs are multi-faceted, and that it may be difficult to link interventions with direct health outcomes, particularly as initiatives involve multiple factors and multiple sectors, which all play a role in determining outcomes. In general, it is best to consider a number of indicators, taken together, before formulating a view on the performance in this area. Indicators and benchmarks work best as flags to indicate a variance from accepted norms and standards. Further investigation is usually required to determine the causes of any given variance from such norms or standards.

A health authority could establish its performance targets by assessing its current (and perhaps historical) level of performance, and then, based on consideration of local factors, determine realistic performance targets. This performance target would be consistent with the goal of performance improvement but would be achievable within a reasonable period of time. Initially, health authorities will set performance targets for a number of indicators. However, over time, and particularly if consistent data collection methods and definitions are applied, it would be realistic for health authorities to share information related to their targets and then develop a consensus approach to determine provincial benchmarks for these indicators. In other words, locally developed performance targets, over time, could lead to development of provincial benchmarks.

7.2 Indicators for the Program on Healthy Infant and Childhood Development

Indicators prepared by the Working Group are presented in Appendix 5. It is understood that some of the indicators may not be under the control or influence of health authorities, but they can, nevertheless, provide important information for the health authorities to collect. Those indicators and benchmarks that are under the control and influence of health authorities provide a basis for ongoing performance review and evaluation.

In many cases, baseline data will need to be established to provide a basis for comparative analysis in future years. Benchmarks will be determined over time between the Ministry of Healthy Living and Sport and the health authorities. In addition, health authorities may wish to establish local or regional benchmarks and performance targets.

8.0 EXTERNAL CAPACITY AND SUPPORT REQUIREMENTS

8.1 Key Success Factors/System Strategies

The previous sections outlined the main components and best practices that health authorities could include in enhancing infant and early childhood development. Successful implementation of effective strategies will also depend on having in place key system strategies, including:

- Strong support from the Board and management of the health authorities, from the Ministry of Healthy Living and Sport, and from the other key players in the region, such as women's health groups, social service agencies, child care settings and local governments.
- Allocation, by the health authorities, of sufficient resources to deliver high quality programs.
- Well-trained and competent staff with the necessary policies and equipment to carry out their work efficiently.
- An information system that provides staff with appropriate support, and provides management with the information it needs to drive good policy and practice decisions.
- High quality and competent management of the infant and early childhood health and development program, including monitoring of performance measures.
- Clear mechanisms of reporting and accountability to the health authority and external bodies.

8.2 Information Management for the Program on Mental Health Promotion and Mental Disorders Prevention

It will be important for health authorities to review their existing information and monitoring systems with respect to their ability to measure and monitor performance indicators. This should include:

- Where necessary, establishing new policies and procedures to ensure that the necessary data is gathered.
- Facilitating the process of recording and monitoring data.
- Assisting in the development of electronic health records to support interdisciplinary and collaborative approaches among health care professions.
- Establishing baseline levels for new datasets as a foundation to compare and assess trends and differences over time.

Health authorities will also need to consider the impact of program monitoring and evaluation on their staffing resources. Expertise will be needed in the fields of program monitoring, program analysis and program evaluation to ensure effective implementation and assessment of the core functions improvement process.

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GLOSSARY

Attachment: Denotes a fundamental parent/caregiver-child relationship involving emotional availability, nurturance and warmth, protection and provision of comfort on the part of the parent, resulting in trust, security and emotional regulation in the infant (Zeanah & Boris, 2000). Attachment is a lifelong process that begins in infancy—attachment relationships are enduring and biologically based. They can be secure, insecure or disorganized. Attachment constructs equip a child with the ability to interpret interpersonal experiences. Early attachment experiences are also important for the development of neurochemical and neuroendocrine systems (Kope & Reebye, 2007).

Best Practices: These are activities based on sound scientific evidence, extensive community experience and/or cultural knowledge. Healthy living interventions will be more effective if they are based on established best practices (Public Health Agency of Canada [PHAC], n.d., *Glossary*).

Birth Defect: Also described by the term "congenital", a birth defect is a structural, metabolic or functional abnormality that is present at birth—it may be detected before birth, during the infant's first year of life ore even later in life. It results in physical and mental disability or is fatal. There are more than 4,000 known birth defects, which may be caused by genetic or environmental factors (MOH, PHW, 2007c).

Birth Weight: the first weight of the fetus or newborn obtained after birth, expressed in grams. Low birth weight (LBW) is defined as less that 2,500 grams. Very low birth weight (VLBW) is less than 1,500 grams (excludes newborns with weight between 0-300 grams) (BC Perinatal Database Registry, 2007). High birth weight (HBW) is more than 4,000 grams.

Breastfeeding: Exclusive breastfeeding is defined as no food or liquid other than breast milk, not even water, given to the infant from birth by the mother, health care provider or family member/supporter with the exception of undiluted drops of syrups consisting of vitamin or mineral supplements or medicines (BCC adapted from WHO/UNICEF, 2004, as cited in BC Perinatal Database Registry, 2007). Exclusive breastfeeding is recommended by the WHO for the first 6 months after birth. It is further recommended that breastfeeding continue for 2 years and beyond, combined with quality food.

Child Care: The non-parental care of children in their home, someone else's home or in a centre, where care and education are provided by a person other than an immediate family member.

Children with Special Needs: Children and youth between birth and 19 years of age who require additional educational, medical/health and social/environmental support, beyond that required by children in general, to enhance or improve their health, development, quality of life and community integration (Ministry of Children and Family Development, n.d.).

Culture: The understandings, patterns of behaviour, practices and values shared by a group of people. Children and families may identify as belonging to more than one culture.

Canadian Prenatal Nutrition Program (CPNP): A prenatal nutrition program for all pregnant women, new moms, and their babies up to six months of age funded by Health Canada. Using a community development approach, the program aims to increase the incidence of healthy birth weights, improve the health of both infant and mother, and encourage breastfeeding.

Determinants of Health (PHAC, n.d., *What Determines Health?*): The range of personal, social, economic and environmental factors which determine the health status of individuals or populations. (WHO, Health Promotion Glossary, 1998) These can include:

1. **Income and Social Status**: Health status improves at each step up the income and social hierarchy. In fact, these two factors seem to be the most important determinants of health.
2. **Social Support Networks**: Support from families, friends and communities is associated with better health.
3. **Education and Literacy**: Health status improves with level of education. Canadians with low literacy skills are more likely to be unemployed and poor, to suffer poorer health and to die earlier.
4. **Employment/Working Conditions**: Unemployment, underemployment and stressful work are associated with poorer health.
5. **Social Environments**: The importance of social support also extends to the broader community. Civic vitality is reflected in the institutions, organizations and informal giving practices that people create to share resources and build attachments with others.
6. **Physical Environments**: Physical factors in the natural environment (air, water quality) are key influences in health. At certain levels of exposure, contaminants in our air, water, food and soil can cause a variety of adverse health effects, including cancer, birth defects, respiratory illness and gastrointestinal ailments.
7. **Personal Health Practices and Coping Skills**: Those actions by which individuals can prevent diseases and promote self-care, cope with challenges, and develop self-reliance, solve problems and make choices that enhance health.
8. **Healthy Child Development**: New evidence on the effects of early experiences on brain development, school readiness and health in later life confirms early child development as a powerful determinant of health.
9. **Biology and Genetic Endowment**: The basic biology and organic make-up of the human body. In some circumstances genetic endowment appears to predispose certain individuals to particular diseases or health problems.
10. **Health Services**: Health services, particularly those designed to maintain and promote health, to prevent disease, and restore health and function contribute to population health.
11. **Gender**: Gender refers to the array of socially-determined roles, personality traits, attitudes, behaviours, values, relative power and influence that society ascribes to the two sexes.
12. **Culture**: Some persons or groups face additional health risks due to their socio-economic environment: marginalization, stigmatization, loss of language and culture, lack of access to culturally appropriate health care and services.

Development: Description of the relatively stable and predictable sequences of growth and change toward greater complexity, organization and internalization that occur at varying and unique rates, patterns and timing, as a result of interactions between biological maturation and environmental influences, including relationships, experiences, social and cultural backgrounds (NAEYC, 1987).

Developmental Delay: When a child is not achieving normally accepted milestones consistent with his/her cohort.

Developmental Disabilities: childhood conditions that require additional educational, medical/health and social/environmental support, beyond that required by children in general, to enhance or improve their health, development, quality of life, and community integration (MHLS definition).

Diversity: Differences and unique attributes within each child based on values and beliefs, culture and ethnicity, language, ability, education, life experiences, socio-economic status, spirituality, gender, age and sexual orientation.

Early Childhood: for the purposes of this core program paper, defined as 7 days of age up to the 6th birthday (5 years 364 days).

Early Development Instrument (EDI): The EDI is a community-based, population-level outcome measure of the quality of children's early years experiences leading up to kindergarten entry. The EDI was developed at McMaster University and has been used internationally to gauge developmental appropriateness in five-year-old children.

Early Childhood Education and Care: the practice of educating and caring for children.

ECE: early childhood educator.

Fetal Alcohol Spectrum Disorders (FASD): term used to describe the range of effects resulting from alcohol use during pregnancy. These can include brain damage, vision and hearing problems, slow growth, and birth defects such as heart problems or bones that are not properly formed. Brain damage associated with FASD can involve lifelong problems with attention, memory, reasoning and judgment. People with FASD are also at high risk of secondary disabilities such as mental health concerns, disrupted schooling, and addictions (HealthLink BC, 2006).

Genetic Diseases: caused by genetic mutations present during embryo or fetal development, although they may be observed later in life. The mutations may be inherited from parent's genome or they may be acquired in utero (MOH, PHW, 2007b).

Health Promotion: Any planned combination of educational, political, regulatory and organizational supports for actions and conditions of living conducive to the health of individuals, groups or communities (L. Green). Health promotion is also the process of enabling people to increase their control over, and to improve their health. In health promotion, therefore,

health is seen as a resource for everyday living, not the objective of living. Health is a positive concept, emphasizing social and personal resources, as well as physical capacities. (Ottawa Charter for Health Promotion, 1986) (Memorial University of Newfoundland, n.d.).

Home Visiting: Public health home visiting has been widely used as an intervention strategy in public health care services in many countries. It includes planned activities, usually by public health nurses, aimed at the promotion of health and prevention of disease. It contributes substantially to individual and social well-being by focusing attention and providing information, training, and other interventions at key points to support individuals, a social group or a community (Malaysia Ministry of Health, n.d.).

High Risk: term used in early identification and intervention programs to describe a situation where, based on the results of a complete assessment and professional judgment, there is a serious risk that a child may not reach his/her potential and that the family may benefit from more intensive supports.

Integration: Service integration and collaboration are related but distinct methods of services delivery. Integration is characterized by features such as common intake and "seamless" service delivery, where the client receives a range of services from different programs without repeated registration procedures, waiting periods or other administrative barriers. In contrast, coordinated systems generally involve multiple agencies providing services, but in different locations and with separate program registration processes (Pindus, Koralek, Martinson, & Trutko, 2000).

Perinatal: the period from the time of conception to one year after birth.

Population Health: focuses on the underlying and interrelated conditions that influence the health of populations over the life course. These include factors such as education, income, early childhood experiences and the social and physical environments that surround individuals and groups. By addressing these factors, a population health approach aims to reach beyond the limited effectiveness of lifestyle-based interventions and reduce disparities in health outcomes (PHAC, n.d., *Glossary*).

Preterm Birth: Live birth after 20 or before 37 completed weeks of gestation (BC Perinatal Database Registry, 2007).

Prevention: approaches and activities to reduce the likelihood of a disease or disorder affecting an individual, to interrupt or slow the progress of the disorder, or to reduce disability (BC Perinatal Database Registry, 2007).

- **Primordial Prevention**: prevention of risk factors, beginning with a change in social or environment conditions.
- **Primary Prevention**: reduces the likelihood of a disease or disorder developing in an individual.
- **Secondary Prevention**: interrupts, prevents or minimizes the progress of a disease or disorder at an early stage.

- **Tertiary Prevention**: focuses on preventing the damage that has already occurred from becoming worse.

Resilience: an ability to recover from or adjust easily to misfortune or change (e.g., recovering from traumatic events, overcoming disadvantages to succeed in life and withstanding stress to function well in the tasks of life.

Risk Factors: social, economic or biological status, behaviours or environments that are associated with or cause increased susceptibility to a specific disease, ill health or injury (BC Perinatal Database Registry, 2007).

Second-hand Smoke: second-hand smoke, also called environmental tobacco smoke, is the combination of sidestream smoke (the smoke given off by the burning end of a tobacco product) and mainstream smoke (the smoke exhaled by the smoker). Of the more than 4,000 chemicals that have been identified in second-hand tobacco smoke, at least 250 are known to be harmful, and 50 of these are known to cause cancer (National Cancer Institute, n.d.).

Screening: A brief assessment procedure designed to identify children who should receive more intensive diagnostic assessment. Screening is designed to help children who are at risk for health and developmental problems, handicapping conditions and/or school failure to receive ameliorative intervention services as early as possible.

Targeted Interventions: The predominant characteristic of these interventions are that children and their families do not seek help, and certain children or families are singled out for the intervention, not necessarily because they already have a disorder but because they are at greater risk for developing one. Children can be targeted in two ways: the identifying characteristic can lie outside the child (e.g., family in poverty), or the children themselves can have the distinguishing characteristics (e.g., behaviour issue) (Offord et al., 1999).

Universal Interventions: Characteristics of this type of intervention are that individual families (and their children) do not seek help and children are not singled out for the intervention. All children in a geographical areas or setting (e.g., school) receive the intervention. Two types of universal programs can be those that focus on particular communities or settings (e.g., a public housing complex) or those that are province-wide or countrywide, for example (Offord et al., 1999).

APPENDIX 1: SUMMARY OF RESEARCH ON COST-BENEFIT ANALYSIS OF EARLY CHILD DEVELOPMENT PROGRAMS

A number of studies have been conducted to assess the cost effectiveness of early childhood intervention programs. For example:

- A 2005 RAND study found a net benefit to society of $34,148 per participant, or a $5.70 return per dollar invested, in early childhood development programs (Karoly, Kilburn, & Cannon, 2005), with the greatest savings reported from higher risk populations. An earlier 1998 RAND report noted that the advantages for program participants, in comparison to control groups, were
    - Gains in emotional or cognitive development for the child and improved parent-child relationships.
    - Improvements in educational process and outcomes for the child.
    - Increased economic self-sufficiency, initially for the parent and later for the child, through greater labour force participation, higher income and lower welfare usage.
    - Reduced level of criminal activity.
    - Improvements in health-related indicators, such as improved maternal reproductive health, and decreased child abuse and maternal substance abuse (Karoly et al., 2005).
- The Chicago Child-Parent Center studied effects of educational enrichment and comprehensive family services on preschool low-income minority children, through follow-up analysis at age 24 years. Researchers concluded that (Wise, da Silva, Webster, & Sanson, 2005)
    - Early education programs had enduring effects, and resulted in a return to society of $7.10 for every $1 spent (government savings were $2.88 and societal benefits were $3.83).
    - The cost of the program was estimated to be US$6,730 (1998 dollars) for 1½ years, with a return of US$47,759 per child.
    - The preschool participants had higher rates of school completion and attendance in 4-year colleges as well as more years of education. They were more likely to have higher rates of employment and health insurance coverage, lower rates of disability, felony arrests, incarceration, depressive symptoms and out-of-home placement (Reynolds et al., 2007).
    - Analysis was based on a large sample (989 in the program and 550 in the control group).

- The Perry Preschool Project was assessed using a longitudinal study, to determine whether a high-quality, active learning preschool program could provide short- and long-term benefits to minority children living in poverty. The program involved 1 to 2 years in preschool with teacher home visiting in Ypsilanti, Michigan. At age 27 years:
    - Cost-benefit analysis estimated that, for every $1 expenditure in preschool programming, an estimated $7.16 was saved in later costs for special education, social services, justice and remediation.
    - Participants had significantly higher earnings, rates of home ownership, levels of schooling as well as fewer arrests and social service interventions than a control group.
    - Participants also had statistically significant gains in the areas of IQ, achievement short- and long-term, and decreased special education, income and welfare participation.
    - This was a relatively small study, with only 58 participants in the intervention group (Karoly et al., 1998; Schweinhart, Barnes, & Weikart, 1993).
- A cost-benefit analysis of the Carolina Abecedarian Project, an intensive full-time care program for children up to 5 years (average annual programs costs were about US$13,900, 2002 dollars, per child). The study found:
    - The benefits outweighed the costs by $4 for every $1 spent.
    - 104 children were involved in the intervention and control groups combined.
- A follow-up study of the Elmira Prenatal/Early Infant Project found that benefits exceeded the costs of the program (programs costs were US$3,300 in 1980 dollars and US$6,700 in 1997 dollars, per child for 2½ years of service) as follows:
    - The investment was recovered only for families where the mother was of low income and unmarried: in these cases the costs of the project per child were recovered before the children turned 4 years old and the intervention saved $4 for every $1 spent.
    - The study was large, based on 300 participants (in intervention and control groups) (Wise et al., 2005).
- Nurse-Family Partnership is an evidence-based, nurse home visitation program for low-income, first-time parents and their children. Researchers have studied costs and benefits and concluded that the program improves health, well-being and self-sufficiency, and over time will return a minimum of $2.88 for every dollar invested (Aos et al., 2004, as cited in Nurse-Family Partnership, 2006).
- A study of the Triple-P Positive Parenting Program was based on participant assessment at 6 months to 3-year follow-up for conduct disorders. It concluded that

  - The intervention would pay for itself if less than 1.5 per cent of conduct disorder cases were averted, and that cost-savings would result if 7 per cent or more cases were averted.

  - The study provided a thorough evaluation with "reasonably-size intervention and control groups." The shorter time frame for measuring benefits was a limitation (Nurse-Family Partnership, 2006).

- The Head Start Program began in the United States in 1965 and is still running. It targets children and families in poverty and provides early childhood education and development services, and health and nutrition services on a part-time basis for one year, for 4-year-old children (1,400 program with 900,000 children involved). There is some "ambivalence" about the effectiveness of this program in the literature: it is difficult to evaluate due to the diversity of the local programs and there have been variable results in terms of achievement as measured by IQ scores. However, as stated by Lynch (2004), it is unreasonable to expect the same gains as in other intensive programs as it receives less funding, thereby reducing the quality in terms of staff ratios, class size, teacher qualifications and pay. The Early Head Start program is a more recent development, which provides services to 60,000 low-income pregnant women and families with infants and toddlers. Preliminary results (Love et al, 2002) indicate that by the age of 3 years, children in the program are performing better on cognitive, language and social-emotional development, and parents are more supportive, use less punitive parenting, provide more stimulating environments and read more to their children (Wright, 2005).

- Research studies indicate that successful outcomes for children are directly linked to the level of quality of early care and education programs. The factors most often associated with quality programs are: well-prepared and compensated providers, small group size and low staff-to-child ratios, low staff turnover, parental involvement, and a safe, healthy and comfortable environment. Without close attention to quality factors, cost savings and beneficial outcomes may not be recognized (Rhode Island Kids Count, 1998).

APPENDIX 2: THE EVIDENCE BASE FOR A MODEL CORE PROGRAM FOR HEALTHY INFANT AND CHILD DEVELOPMENT

Taken from: *Core Public Health Prevention Functions: Early Childhood Health and Development, Evidence Paper* (2007), by the Ministry of Health, Population Health and Wellness.

Early experiences can exert a powerful influence in making children physically strong and emotionally healthy. This paper summarizes the primordial, primary and early secondary prevention evidence for early childhood health and development from a public health perspective. Several limitations presented themselves in analyzing conclusions from the early childhood health and development literature from a public health perspective. A program may appear successful, but it may not have been evaluated, or the evaluation was not published. A program may be effective, but only in a targeted population, making generalization difficult. As well, much of the literature originates from countries outside of Canada and thus generalization is difficult. Most of the research has been completed in the Caucasian population versus multicultural populations. There is limited "public health" literature (versus "health" or social science literature) on many of the topics. However, despite these limitations, current research reveals key areas of focus for public health services.

The research in this paper has been categorized as follows:
Type 1 – at least one good systematic review (including at least one randomized controlled trial).
Type 2 – at least one good randomized controlled trial (RCT).
Type 3 – an interventional study without randomization.
Type 4 – an observational study.
Type 5 – expert opinion: influential reports and studies, national guidelines/policies.

Public Health Strategies, Approaches and Settings

Types 1 and 2

- There is strong evidence to support early childhood development programs for their effectiveness in preventing delay in cognitive development and increasing readiness to learn.
- The effectiveness of preschool prevention programs for disadvantaged children are greatest for those that have a direct teaching component in preschool, have a follow-through educational component in elementary school and are longer in duration.
- There is good evidence to support professional or professional/paraprofessional home visiting programs to improve maternal/family and child outcomes. Programs that offer home visiting services in conjunction with centre-based early childhood education appear to produce larger and longer lasting results than programs that offer home visiting services alone.

- Telephone use as a method of providing health care interventions (in the context of other services such as home visiting or educational materials) has demonstrated positive impacts on health, knowledge, behaviours and health resource utilization.
- Child care settings are an important venue to influence child and parental health. Positive outcomes are found for education of staff and parents around a number of topics (e.g., infection control, nutrition, speech/language).

Type 5

- Studies demonstrate that early childhood prevention programs aimed at decreasing the incidence of childhood problems are more successful over the long term if they involve the parents, begin early in the child's life and address multiple risk factors.
- The Internet is a growing source of information, but has not been adequately studied for the early childhood population.
- There are gaps in health surveillance for the early childhood population.
- There was limited literature found on public health services in group settings.

Parenting

Types 1 and 2

- There is clear evidence that parent education and support programs are effective in creating positive changes in children's behaviour as well as changes in parents' behaviours and relationships with their children.
- There is consensus among researchers that effective parenting education and support programs share a number of common characteristics.
- There is some support for the use of group-based parenting programs to improve the emotional and behavioural adjustment of children under the age of 3 years. However, there is insufficient evidence to reach any firm conclusions regarding the role that such programs might play in the primary prevention of such problems. Furthermore, there are limited data available concerning the long-term effectiveness of these programs. There is currently insufficient evidence to reach any firm conclusions regarding the role of parenting programs in the primary prevention of mental health problems.
- There is limited good literature on services to support father involvement in parenting. There is some evidence that if interventions involve active participation with or observation of the father's own child, the intervention may be effective in enhancing both the father's interactions with the child and a positive perception of the child.
- The author was unable to find Type 1 and 2 evidence on parenting and ethnicity/culture or teen/young parenting services.

Types 3 and 4

- Immigrant parents are at particularly high risk of alienation from systems of health care and support services that are available to low-income and other vulnerable populations.

Type 5

- The literature identifies key areas of parenting that parents need to know.
- While literature on cultural competency still requires further development, there is some evidence of positive outcomes for culturally competent care.
- There are scant long-term evaluations and good research on child and youth programming for First Nations and Inuit children.
- There have been mixed results on teen parenting and teen-tot programs. Group-based intervention for adolescent parents has shown to be both more supportive and more cost-effective than individual intervention. Intervention needs to take into account the parents' own developmental and social needs. Programs should incorporate adults living with the parenting youth.
- Physicians are the top group that parents turn to for information and advice. However, it is unknown whether parents change their parenting based on physicians' advice.
- Regardless of method of parenting education/support delivery, standardized written information or instructions provided in combination with other activities, such as video-taped vignettes, role-play or facilitated discussion appear to be most effective at achieving lasting behaviour changes.
- Although there is a plethora of books and magazines on parenting, there is limited information on what parents are reading about and the impact on parenting.
- The effectiveness of parenting and preschool television programs, giving verbal information or telephone advice without other interventions, use of electronic mail, CDROMS and the World Wide Web has not been established.
- Best practices for the development of parent health education resource material have been identified, but systematic reviews could not be found.

General Development

Types 1 and 2

- The current evidence is insufficient to recommend routine screening for developmental dysplasia of the hip in infants as a means to prevent adverse outcomes.

Types 3 and 4

- Systematically eliciting parental concerns about development has been identified as an important method of identifying infants and young children with developmental problems.

Type 5

- Although a number of reputable organizations recommend developmental screening and surveillance, there is lack of sound, current evidence on the broad use of developmental screening and surveillance for the 0 to 5 years population.

Physical Health and Development: Prenatal Influences

There is limited research on the preventive needs and services required for preterm/low birth weight and fetal alcohol spectrum disorder (FASD) infants and their families once they are discharged to the community and ongoing into early childhood.

Type 5

- Modest intervention-related differences for heavier low birth weight premature children have been found in the Infant Health and Development Program (USA). This program is designed to reduce the developmental and health problems of low birth weight premature infants.
- Community-based programs for vulnerable families have identified "good practices" for reducing harms associated with substance use during pregnancy (e.g., using a grass-roots, bottom-up approach in program development).
- Referral, screening, case management, outreach, education, counseling, consultation, advocacy and policy development are all important components for families of children with FASD.

Physical Activity and Motor Development

The importance of physical activity is well documented in the literature, but there is a lack of sound research addressing preventive services to support physical activity in the early childhood population.

Type 5

- Guidelines have been developed on healthy, active living and physical activity, but they are not specific to the early childhood population.

Physical Growth and General Health

Type 1

- Even though current Canadian recommendations include growth monitoring at regular intervals from birth to preschool, there is little information to evaluate the benefits and harms of growth monitoring.
- There is limited evidence on the effectiveness of obesity prevention interventions in children.

Types 4 and 5

- Research shows that parents value well-child care and parent-clinician communication, but there is limited research regarding what services promote good outcomes including optimal frequency of these services.
- There is a lack of evidence and consensus regarding the role of public health preventive services in the identification and management of failure to thrive.
- Home visiting programs and pre/post-natal nutrition programs for vulnerable families have shown some positive outcomes on birth outcome and maternal and child nutrition.
- Fetal development, genetics, breastfeeding, parental control versus self-regulation of eating habits, caregiver attitudes and knowledge of nutrition, physical activity, and television viewing have all been implicated as risk or protective factors.
- It has been suggested that public health obesity prevention strategies should target early childhood via multiple avenues.

Nutrition and Breastfeeding

a) Breastfeeding for Early Childhood Health and Development

Type 1

- Infants should be exclusively breastfed for 6 months.
- Breastfeeding is a public health strategy for improving infant and child health, improving maternal morbidity, controlling health care costs and conserving natural resources.
- Breastfeeding helps to prevent respiratory, intestinal and ear infections, allergies, cardiovascular disease and obesity. There is emerging evidence that breastfeeding helps to prevent diabetes, inflammatory bowel disease and cancer.
- Errors made in reconstituting formula put infants' health at risk.
- Providing free formula decreases the rate of exclusive breastfeeding.

- Face-to-face breastfeeding interventions are effective but it is not clear whether interventions should involve education or support or a combination of both education and support.

Type 5

- Creating breastfeeding-friendly environments is a public health strategy to promote breastfeeding. An example is the Baby-Friendly Initiative.

b) Nutrition (Beyond Breastmilk) and Early Childhood Development

There is a lack of Canadian data on determinants of healthy eating and dietary behaviours in children.

Type 1

- Food allergy prevalence is between 4 and 6 per cent of the population and is increasing.

Type 4

- The diet of preschoolers is high in total fat, saturated fat, added sugar and carbonated soft drinks, and low in vegetables and fruit. This is concerning because of the increased risk of obesity, heart disease, certain cancers and asthma.

Type 5

- The American Academy of Pediatrics and the European Society of Pediatric Allergy and Clinical Immunology and the European Society for Paediatric Gastroenterology, Hepatology, and Nutrition differ in their definitions of infants who are at risk for allergy, delayed introduction of solid foods, and pregnancy/lactation allergen avoidance.

c) Nutritional Deficiencies and Supplements

Type 1

- Micronutrient shortages in early childhood have serious adverse consequences that may be only partly reversible.
- Immigrant populations are particularly vulnerable to micronutrient shortages in early childhood.
- Iron-deficiency anemia in early childhood is associated with poor cognitive and motor development and depressed school achievement in middle childhood. However, poverty confounds this relationship. These effects may not be reversible.
- The evidence is mixed regarding whether there are neurodevelopmental and growth benefits to supplementing formula with long chain polyunsaturated fatty acids, similar to those found in breast milk.

Type 5

- The current recommendation to supplement all breastfed infants with 400IU of vitamin D is controversial. It has been recommended that the role of the primary care professional is to understand the vitamin D dilemma, promote breastfeeding and prevent vitamin D deficiency rickets.
- There are three primary intervention strategies suggested to prevent iron-deficiency anemia: offering more foods with high-bioavailable iron, fortifying foods targeted to young children, and supplementing mother and/or child.

d) The Feeding Relationship

Type 1

- While parents play an important role in determining eating habits and weight development of their children through their behaviours, attitudes and feeding styles, the complexity of child feeding problems is unlikely to be explained solely by parental behaviours or genetic tendencies.
- Viewing television has an enormous potential influence on children's eating behaviours that can overshadow familial influences.

Type 4

- Children with the strongest preferences for high-fat foods and highest total fat intakes have heavier parents than children with lower scores, and children's vegetable and fruit intake is associated with parental vegetable and fruit intake.
- Children have been found to accept or reject food based on qualities of the food (taste, texture, smell, temperature or appearance) as well as environmental factors such as the setting, presence of others and the anticipated consequences of eating or not (including more time to play).
- There appears to be an interplay of infant temperament and parental responses shaping picky eating behaviours. Parents of picky eaters often limit exposure to new foods and foods children dislike. It is recommended that caregivers be provided with information about methods for dealing with picky eating because children may experience "learned safety" which lessens neophobia.

Type 5

- Mealtimes can be viewed in the context of family rituals where interactions, traditions and celebrations reinforce identity, a shared sense of belonging, and a vehicle to transmit family values, attitudes, culture and goals, thus providing children with a sense of security.

- Expert opinion supports a division of responsibility in feeding where parents provide appropriate food and feeding structure/limits on negative behaviours and children decide whether or not to eat and how much to eat.

e) Nutrition Programs

Type 1

- Nutrition counselling during the first year of life improves maternal and professional practices in child nutrition and feeding. Nutrition education should be focused upon identifying and decreasing barriers to good nutrition for children aged 1 to 5 years and their caregivers, including social and physical factors.
- The US Special Supplemental Nutrition Program for Women, Infants and Children (WIC) has beneficial effects on infant birth weight, low birth weight rates, preventing preterm delivery, children's nutrient intakes, and decreasing health care costs. There is no national Canadian food assistance/meal program like WIC with such a strong body of associated research.
- Best practice guidelines promoting healthy eating patterns use one or more of the following components: small group activities, goal setting, social support, interactive food-related activities (e.g., cooking) and family participation and assisting clients to assess and access community resources (e.g., referral to resources, promotion of low-cost physical activity options).

Type 5

- Health professionals have identified the importance of nutrition screening of preschool children, yet there is currently no clear process for identifying nutrition problems in this population. However, a nutrition screening tool for 3-5 year olds, NutriSTEP, is been under development for caregivers, child care providers and nutrition and health professionals across Canada.

f) Food Insecurity

Type 1

- Breastfeeding provides total food security for infants.

Types 4 and 5

- Food insecurity has health implications for young children.
- Since food security is a social determinant of health, a population health approach is needed to address food insecurity.
- Strategies have been identified for public health professionals to enhance the effectiveness of community food security work.

g) Nutrition for Preterm and Low Birth Weight Infants

Type 1

- The preferred food for premature infants is fortified milk from the infant's own mother, or alternatively, a formula designed for premature infants. Infants who are fed their mother's milk early in life have greater visual acuity, language skills and developmental outcomes than comparable groups of infants fed cow's milk-based infant formula.
- LCPUFA-added formula supports early visual system development but it is not known whether such formulas result in a lasting advantage across the lifespan.

Type 4

- Low birth weight and preterm delivery are associated independently with small, but measurable, delays in motor and social development through early childhood.
- The timing of introducing complementary foods varies among caregivers of preterm infants and compliance with guidelines is poor.
- Preterm infants need to be followed closely from birth—parents appear to benefit from ongoing supportive guidance and appropriate goal setting for feeding achievements from a well-coordinated interdisciplinary care team.

h) Marketing Food to Children/Television Viewing

Type 1

- There is a positive correlation between time spent watching television and being overweight or obese.

Type 4

- Pressure from society and peers, bad weather, having multiple children and tension between parents are identified as barriers to appropriate preschooler screen time. Parents are not concerned about their child's screen time.
- Low-income and minority children watch more television and are exposed to more commercials advertising low nutrient food.

Type 5

- There is strong public support for interventions aimed at reducing overweight and obesity among children and adolescents, particularly prohibiting advertising for fast food and less healthy foods.
- The Canadian Paediatric Society recommends limiting television watching to one hour or less for preschoolers and two hours or less for school-aged children. The American Academy of Pediatrics recommends that children should have no televisions in their

bedrooms, viewing should be limited to no more than 1 to 2 hours per day of educational, non-violent programs, and children under the age of 2 years should not watch television.

Environmental Health

Types 1 and 2

- The evidence suggests that certain interventions are effective in reducing children's exposure to second-hand smoke. There is emerging evidence that a theoretically-based, multi-component intervention of sufficient intensity, provided during the postpartum period, can have a modest effect on patterns of smoking relapse at six months postpartum.
- There is fair evidence for targeted lead exposure screening of high-risk children, but there is insufficient evidence to recommend for or against universal screening.
- Many health promotion interventions used to increase public awareness of environmental health risks or adoption of risk reduction behaviours appear to be effective.

Type 5

- There is limited good evidence on intervention strategies for the primary prevention of asthma.
- There is a risk of Bisphenol A contaminants in baby bottles, as the chemical is released from plastic when boiling water contacts the bottle.

Sexual Development

There has been very little focus on the sexual health and development of children under the age of 5 in both the formal research literature and other reports. The literature review revealed scant information on the role of public health in promoting sexual health for children under 5 years old. A number of studies have agreeing results that behaviours that appear to imitate adult sexuality are very uncommon in observations of normal groups of children, but are more common among children who have been the victims of abuse.

Emotional and Mental Health: Parental Influences

Type 2

- The few programs studied specifically addressing parent education and support for parents with a mental illness have not yet provided evidence that they produce long-term benefits.

Types 4 and 5

- The research shows that a number of preventive interventions are successful in preventing new cases of parental mental disorders. These include group sessions, parenting sessions and counselling.
- Breastfeeding can act as a protective mechanism for both mother and baby in moderating the altered interactions that are seen to occur when mothers are depressed. Stable breastfeeding patterns, even in depressed mothers, led to more positive dyadic interactions, and less likelihood of highly reactive infant temperament.
- A number of tools for the identification/screening of parents for mental illness have been studied.

Child Mental Health and Attachment

Types 1 and 2

- There is little research evidence to show that universal early childhood developmental programs can improve mental health and developmental outcomes in disadvantaged populations of children and families.
- Home visiting by professionals and/or paraprofessionals has some positive mental health outcomes, but its impact on promoting positive parent-child interactions or positive child development is inconsistent. Families at highest risk benefit most from the interventions.
- Prevention programs for child mental health are more effective if they are started early, carried out in multiple domains in the lives of children, are intensive, are long-term, employ skilled teachers, train parents to use reinforcement effectively and empower parents.
- Two generation programs that provide services similar to early childhood care and education programs as well as a variety of services for parents (e.g., linking them with job training) have mixed effects on child outcomes and no effect on parental outcomes.
- Efficacious prevention programs have been reported for conduct, anxiety and depressive disorders in children. Psychological interventions for the prevention of depression in children and adolescents are effective immediately after the programs are delivered. There is a significant reduction in scores on depression rating scales for targeted, but not universal interventions. There is no evidence of effectiveness for educational interventions (providing information only) for preventing depressive disorders.
- Programs modifying the school environment, supporting individually focused mental health promotion efforts and attempting to help children negotiate stressful transitions yield significant effects (systematic review in 2-year-old to 18-year-old population).
- A number of preventive interventions to enhance parental sensitivity and infant attachment have been found to be effective

- There is evidence to support a number of specific skills for parents in order to promote infant/child emotional development and secure attachment.

Type 5

- Best practice approaches to mental health and well-being of Aboriginal children have been established, but sound research is limited.

Speech, Language and Communication

Types 1 and 2

- Several aspects of speech screening have been inadequately studied to determine optimal methods, including which instrument to use, the age at which to screen and which interval is most useful. Use of risk factors (e.g., familial history), to guide selective screening is not supported by studies. Recent studies have shown the predictive nature of parental report for speech/language delays.

Types 3, 4 and 5

- Programs that support daily reading/storytelling to a young child have a positive effect on speech and language development.

Type 5

- Speech/language assessment tools and protocols designed for monolingual populations are generally not appropriate for multilingual populations.
- The “late talker” literature is inconclusive. There is insufficient evidence to predict which late talkers will catch up and which ones will continue to experience varying levels of difficulty. The impact of language intervention on linguistic outcomes of late talkers has not been addressed in longitudinal studies.

APPENDIX 3: MATRIX OF POPULATION HEALTH DETERMINANTS THAT INFLUENCE INFANT AND CHILDHOOD DEVELOPMENT

Population Health Factors[3] that Influence Healthy Infant and Child Development	**Section of Core Program Evidence Paper (2007)**	**Components of Healthy Infant and Child Development Core Program**	**Linkages with Other Model Core Programs**
Physical Health and Well-Being *Physical Characteristics* • Genetic makeup • Hearing, vision and speech abilities • Motor development • Growth	i.) Prenatal Influences (p.50) ii.) Physical Activity and Motor Development (p.54) iii.) Physical Growth and General Health (p.57) v.) Hearing (p.96) vi.) Vision (p.98) vii.) Dental (p. 100)	*Preterm and Low Birth Weight Infants* • Universal – Infants – Promote and support infant screening by family practitioners and specialized health providers for a full range of disorders and defects using standardized tools/tests including hearing screening (Prevention) • Targeted – Infants - Coordinate early intervention, education and follow-up with parents of preterm and low birth weight infants, including clinic-based and/or home visits to positively influence growth and development and to ameliorate the affects of low-birth weight as much as possible (Prevention) *General Development* • Advocacy for healthy living strategies to support healthy nutritional practices, vigorous physical activity for children, and involvement in sports and recreational programs (Leadership) • Universal – Infants – Provide ongoing health education, advice and support for infants and new parents through well-baby clinics, immunization clinics, and groups sessions to encourage … and healthy infant development (Prevention) • Universal - Infants – Promote and support infant screening by family practitioners and specialized health providers for a full range of disorders and defects using standardized tools/tests (Prevention) • Universal – Toddlers and Preschool – Provide ongoing health advice, education and support through well-child clinics, immunization clinics and groups sessions to enhance parent's knowledge and skills and to promote healthy early childhood development (Prevention) • Universal – Toddlers and Preschool - Ongoing risk identification and developmental surveillance during well-child clinics, group sessions, home visits for vulnerable children, including (Prevention): o Recognizing abnormal appearance and functions through informed observation of a child's development including the failure to achieve developmental milestones; o Eliciting parental concerns about development, using a standardized parent questionnaire when appropriate, in combination with individual developmental screening instrument where indicated. *Hearing, Vision, Speech and Dental Health* • Targeted – Toddlers - Refer children with speech and language delays to a speech/language expert for assessment specialized interventions (Prevention) • Universal – Preschool - Vision screening for children before age 5 (Prevention)	• Reproductive Health and Prevention of Disabilities • Dental Health • Prevention of Unintentional Injuries • Prevention of Chronic Diseases • - Communicable Disease Prevention and Control Core Program

[3] Population health determinants are taken from *The Well-being of Canada's Young Children* (2003), by the Government of Canada. Also included are key factors discussed in the core program evidence review and earlier sections of this model core program paper.

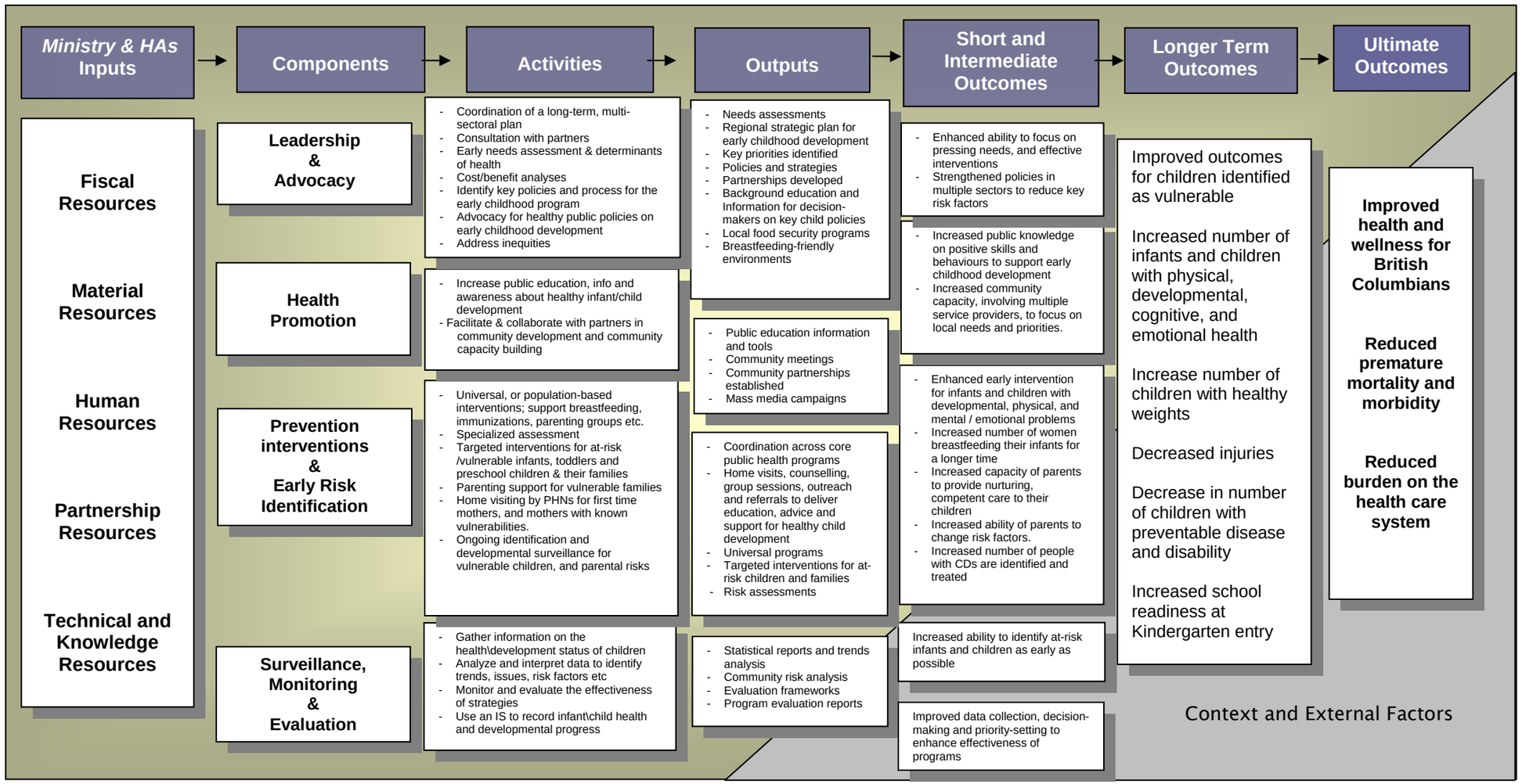
Population Health Factors[3] that Influence Healthy Infant and Child Development	Section of Core Program Evidence Paper (2007)	Components of Healthy Infant and Child Development Core Program	Linkages with Other Model Core Programs
Physical Health and Well-Being *Nutrition and Food Security*	iv) Nutrition and Breastfeeding (p.67) • Breastfeeding for Early Childhood Health and Development • Nutrition and ECD • The Feeding Relationship • Nutritional Deficiencies and Supplements • Nutrition Programs • Food Insecurity • Nutrition for Preterm and Low Birth Weight Infants	*Breastfeeding*: • Creation of breast-feeding friendly environments and communities as a public health strategy to promote breastfeeding and support breastfeeding mothers. (Leadership and Advocacy) • Universal (Infant) – Proactively support breastfeeding exclusively for a 6-month period (with continuation for 2 years and beyond combined with quality food), through ongoing encouragement and guidance by peer counsellors and health professionals. (Prevention) *Nutrition*: • Universal (Infant, Toddler, Preschool) – Identify vulnerabilities and risk during well-child clinics and/or home visits in the following: child feeding and nutritional practices. (Prevention) • Targeted (Infant) – Provide nutritional counselling where necessary, including individual counselling to improve parental practices in child nutrition and feeding, including advice and assistance in accessing community resources for food-insecure families. (Prevention) • Targeted (Toddler) – Provide nutritional education and advice for parents of children with nutritional disorders, growth disturbances, including overweight and obesity. (Prevention) • Targeted (Preschool) – Address nutritional disorders, failure to thrive, growth disturbances, including overweight and obesity through individual or groups sessions, clinic-based and/or home visiting interventions as appropriate. (Prevention) *Food Security*: • Targeted (Infant) – Provide nutritional counselling where necessary, including individual counselling to improve parental practices in child nutrition and feeding, including advice and assistance in accessing community resources for food-insecure families. (Prevention) • Assist families in accessing community resources for additional advice, treatment and support. (Prevention). • Advocate for local food security programs that promote community initiatives to address food insecurity such as community gardens, farmers' markers, community kitchens, etc. (Leadership)	• Reproductive Health and Prevention of Disability • Food Security • Healthy Living Core Program • Food Safety
Physical Health and Well-Being *Environmental Conditions*	ix) Environmental Health (p.100) • Children's vulnerability • Second Hand smoke exposure • Other environmental toxins	*Environmental* • Encourage tobacco cessation and prevention of exposure to environmental tobacco smoke in homes with young children, through a coordinated approach with tobacco cessation heath professionals. (Prevention) • Collaborate with environmental health officers in monitoring child asthma and respiratory diseases and identifying measures to reduce children's exposure to air pollution. (Prevention) • Conduct lead exposure screening for high-risk children and provide follow-up interventions where lead levels are found to be at unacceptable levels. (Prevention)	• Community Environmental Health • Water Quality • Air Quality • Food Safety • - Community Environmental Health

Population Health Factors[3] that Influence Healthy Infant and Child Development	Section of Core Program Evidence Paper (2007)	Components of Healthy Infant and Child Development Core Program	Linkages with Other Model Core Programs
Emotional Well-Being *Parenting and Attachment* • Parenting practices (style)	5. Parenting (p.29) • Parenting Styles • Parent attitudes and behaviours • Parenting and ethnicity/culture • Teen/young family parenting • Parenting prevention services and interventions	*Parenting* • Provide information resources and tools to increase awareness of the importance of healthy infant and child development. (Health Promotion) • Focus public information on key risk factors and development of skills strengthen protective factors such as parenting skills, cognitive stimulation, attachment and care support. (Health Promotion) • Universal (Infant, Toddler, Preschool) – Ongoing education, advice and support through well-child clinics, immunization clinics, and group sessions. (Prevention) • Universal (Infant) – Identify vulnerabilities and risk during well-baby clinics and/or home visits, including parenting skill and capacity. (Prevention) • Universal (Infant, Toddler, Preschool) – Ongoing identification of parental risk factors through the gradual building of trust, related to: intimate partner violence and abuse; alcohol and problematic substance use; parental mental health disorders; and poverty, education, and/or isolation. (Prevention) • Targeted (Infant) – Provide parenting skills development and parenting support, where needed, through multi-modal programs involving a range of strategies such as group sessions, written information/ instructions, and home visits. (Prevention) • Targeted (Infant) – Collaborate with partners in providing teenage parenting programs to enhance parenting skills and development of life skills. (Prevention) • Targeted (Toddler, Preschool) – Provide regular, intensive interventions for high-risk children to build parenting skills, foster positive relationships and behaviours, and decrease child neglect and abuse.	• Reproductive Health and Prevention of Disabilities • Mental Health Promotion and Prevention of Mental Disorders • Prevention of Violence and Abuse • Healthy Living
	8. Emotional/Mental Health and Development (p. 110) i.) Prenatal/Parental Influences (p. 110) ii.) Child Mental Health & Attachment (p. 113) ix.) Child Abuse/Neglect (p. 109)	*Emotional/Mental Health* • Focus public information on key risk factors and development of skills strengthen protective factors such as parenting skills, cognitive stimulation, attachment and care support. (Health Promotion) • Universal (Infants) – Identify vulnerabilities and risk during well-baby clinics and/or home visits, including parenting skill and capacity. (Prevention) • Universal (Infant, Toddler, Preschool) – Ongoing identification of parental risk factors through the gradual building of trust, related to: intimate partner violence and abuse; alcohol and problematic substance use; parental mental health disorders; and poverty, education, and/or isolation. (Prevention) • Targeted (Infant, Toddler) – Provide regular, intensive interventions incorporating social learning principles to build parental acceptance and responsive to their child, foster positive attachment, build infant security and decrease child neglect and abuse. (Prevention) • Universal (Toddler) – Collaborate with partners in promoting and supporting key behaviours to enhance … key protective factors through multiple settings such as child care programs, early learning programs and family support agencies. (Prevention) • Targeted (Toddler) – Provide regular, intensive interventions for high-risk children to… foster positive relationships and behaviours and to decrease child neglect and abuse. (Prevention) • Universal (Preschool) – Collaborate with partners in promoting and supporting key protective behaviours to enhance…healthy social, emotional and cognitive development through multiple settings. (Prevention)	• Mental Health Promotion and Prevention of Mental Disorders • Prevention of Violence and Abuse • Reproductive Health and Prevention of Disabilities • Healthy Living

Population Health Factors[3] that Influence Healthy Infant and Child Development	Section of Core Program Evidence Paper (2007)	Components of Healthy Infant and Child Development Core Program	Linkages with Other Model Core Programs
Cognitive Learning and Language Communication **Social Knowledge and Competence** *Family structure and social relationships* • Family income • Maternal education • Parental separation *Socio-economic status* (e.g., family income and parent education levels) *Neighbourhood socio-economic character* *Access to quality child care and developmental opportunities*	9. Speech, Language & Communication Development (p. 118)	*Cognitive Development/Social Development* • Focus public information on key risk factors and development of skills strengthen protective factors such as … cognitive stimulation, attachment and care support. (Health Promotion) • Target information and resources to strengthen the skills of specific vulnerable groups through tailored information reflecting their respective needs, culture, language ability, etc. (Health Promotion) • Universal (Infant) – Conduct risk assessments for specific social, economic and environmental risk factors using a validated risk assessment tool. (Prevention) • Universal (Infant) – Identify vulnerabilities and risk during well-child clinics and/or home visits, including... risk related to family structure, socio-economic conditions, neighbourhood character, culture. (Prevention) • Targeted (Preschool) – Supplement home visits through collaborative preschool/day care prevention initiatives to enhance social, emotional and cognitive development. (Prevention) • Advocate for healthy public policies such as: …enhanced access to quality child care services including comprehensive programs to address the needs of high-risk children and their parents. • Advocate for addressing inequities in social, economic, cultural and environmental conditions that impact on early childhood development, such as the need for safe and stable housing, safe neighbourhoods, anti-poverty measures, prevention of discrimination, etc. • Collaborate with the Ministry of Children and Family Development (MCFD) and community agencies to enhance access to day care prevention initiatives, as a supplement to home visits for additional supporting in enhancing protective factors. • Work with community agencies and MCFD to enhance availability and capacity of non-parental day care programs for children living in conditions of risk, with comprehensive programs of language, cognitive, perceptual-motor and social development. (See also related initiatives noted above)	• Mental Health Promotion and Prevention of Mental Disorders • Prevention of Violence and Abuse • Reproductive Health and Prevention of Disabilities • Healthy Living

APPENDIX 4: HEALTHY INFANT AND CHILD DEVELOPMENT LOGIC MODEL

Goal: To maximize the healthy physical, emotional and social development of infants and children in BC, from 7 days to 5 years of age (up to the 6th birthday)



Note: April 8, 2009.

APPENDIX 5: INDICATORS FOR HEALTHY INFANT AND CHILD DEVELOPMENT

Indicator	Best Practice Evidence/Rationale	Type	Potential Data Source
Cross-sectoral coordination and collaboration on ECD initiatives Regional and provincial integrated ECD strategies	• Supports leadership and advocacy in collaboration with partners (e.g., Ministry of Children and Family Development) and stakeholders strengthens local services and supports for healthy infant and child development. • Identifies key policies and optimal processes for healthy infant and child development.	Process	Health Authority
Percentage of infants exclusively breastfed at 6 months	• Support exclusive breastfeeding for the first six months and continued breastfeeding for two years with complementary foods. • Create breastfeeding-friendly environments and communities as a strategy to promote breastfeeding. • Breastfeeding is a public health strategy for improving infant and child health, improving maternal morbidity, controlling health care costs, and conserving natural resources.	Outcome	PARIS/iPHIS/Panorama Family Health Canadian Community Health Survey
Percentage of children exposed to second-hand tobacco smoke at home	• Encourage tobacco cessation/prevention of exposure to environmental tobacco • Passive exposure to environmental tobacco smoke is associated with an increase risk of SIDS • Environmental tobacco exposure is the most harmful of all indoor air pollutants with the main impact on child health.	Outcome	Panorama Family Health BC Perinatal Database TABS – Tobacco Attitudes and Behaviour Survey (BC Stats)
Percentage of children aged 2-5 years assessed as appropriate height and weight for age	• Identifies growth issues that may affect general health and development. • Physical activity has positive effects on growth and maturation in children.	Outcome	PARIS/ iPHIS/Panorama Family Health, NLSCY
Percentage of children receiving every dose of recommended vaccines by their 2nd birthday Percentage of kindergarten children immunized and up-to-date for age. * Percentage of children up to date at 6 years of age measured by the end of calendar year. (* change to agent/vaccine specific rates, not single cumulative % measure)	• Vaccines are an efficient and cost-effective means of reducing morbidity and mortality.	Outcome	PARIS/iPHIS/Panorama/PARIS BCCDC
Percentage of children living in conditions of risk (teenage parents, poverty etc.)	• Collaborate with partners (e.g. Ministry of Children and Family Development) in providing parenting programs. • Provide parenting skills development (where needed). • Provide regular, intensive interventions for high-risk children (e.g., home visiting program).	Outcome	BC Perinatal Database MCFD Social Services Index Census
Percentage of infants exposed to alcohol or tobacco in pregnancy	• Tobacco exposure and alcohol use during pregnancy can have adverse health effects on child health. • Focus public education on key risk factors for health and development.	Outcome	Perinatal Database, NLSCY, Stats Canada

Indicator	Best Practice Evidence/Rationale	Type	Potential Data Source
Percentage of mothers screened for postpartum depression	• Young children with depressed mothers are more likely to demonstrate social-emotional and behavioural problems, difficulties in school, trouble with self-control, poor peer relationships and aggression. • Identify parental risk factors.	Outcome	PARIS/ iPHIS/Panorama Family Health, Perinatal Database
Percentage of children with a preventable injury	• Injury is the leading cause of hospitalization and death for children in BC.	Outcome	BCIRPU database, Representative for Children and Youth, Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates), Canadian Institute for Health Information, National Trauma Registry
Percentage of infants with low birth weight by gestational age	• Greater risk of physical and developmental problems.	Outcome	BC Perinatal Database Statistics Canada, Vital Statistics, Birth Database
Percentage of children identified with a developmental delay	• Supports early identification of developmental delay.	Outcome	PARIS/iPHIS/Panorama Family Health,
Percentage of children age 5 years with dental caries	• Monitoring of early prevention activities to reduce dental decay.	Outcome	PARIS/iPHIS/Panorama Family Health,
Percentage of children 3-5 years identified with a vision disorder	• Supports early identification of visual disorders.	Outcome	PARIS/iPHIS/Panorama Family Health,
Percentage of infants identified with a hearing disorder	• Supports early identification of hearing disorders.	Outcome	PARIS/iPHIS/Panorama Family Health, BEST
Percentage of children identified with a speech/language disorder	• Supports early identification of speech/language disorders.	Outcome	PARIS/iPHIS/Panorama Family Health,
Percentage of children identified as vulnerable on the EDI based on 5 domains: physical health and well-being, social competence, emotional maturity, language and cognitive development and communication skills and general knowledge	• Supports surveillance of early childhood health and development. • Ensures availability and access to early intervention services.	Outcome	Early Development Index (EDI)
Percentage of resources directed/ targeted to at-risk families	• Focus public education on key risk factors for health and development. • Gathering and analyzing information to identify trends as a basis for planning and evaluation.	Process	Health Authorities
Percentage of at-risk families accessing public health programs and support services	• Gathering and analyzing information to identify trends as a basis for planning and evaluation.	Process	Health Authorities

Note: Wherever possible, these indicators were linked to the Healthy Infant and Child Development Logic Model (Appendix 4).