**ABRIDGEMENT**

# Early Childhood Development (ECD) Literature Review

(Factors that influence early childhood development, home visitation and community-based collaborative programs, as well as the features of those programs or interventions that promote health equity)

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# ABRIDGEMENT: Early Childhood Development Literature Review

## PREFACE

This literature review explored the research on requested early child development (ECD) topics, specifically the factors affecting healthy early child development, the benefits and effectiveness of in-home visiting and community-based collaborative initiatives, and the features of ECD interventions that promote equity of outcomes.[a] As per the terms of reference, this review does not attempt to speak to, describe, or evaluate programs within Trail or other communities. Some evaluative comments emerge in this review; it should be noted that any such statements come from the literature itself and not from an assessment carried out by the authors of this review. Any evaluative comments should be considered within the context of the section within which they appear and attributed to the researcher(s) of that work.

## ABRIDGEMENT

The Trail Area Health and Environment Committee (THEC) has a goal, approved through community consultation in 2010, to reduce the average blood lead level for children 6 to 36 months in Trail to 4 µg/dL by 2015.[1] THEC seeks to ascertain whether more can be done at a family or community level to improve early childhood development (ECD) and children's health outcomes in the population and thereby create resilience or protection, or offset in some way the potential negative impacts from children's exposure to low levels of lead. For this reason, a scoping review of the literature was undertaken to map evidence-based information pertaining to ECD factors, in-home visitation, and interventions aimed at fostering healthy ECD through in-home visits and community-based collaborative programs. Features of community and home visiting programs or interventions that may promote health equity are also of interest. Lead, other heavy metals, and chemical agents are not the focus of this review.

With respect to factors that influence ECD, evidence is grouped by seven categories: health and safety; education; material well-being, equity; family and peer relationships; participation; subjective well-being; behaviours and risks; and environment. In each category, the assembled evidence speaks to the global pool of knowledge and a number of conclusions stand out. For example, in relation to health and safety, responsiveness and appropriate maternal-infant interaction are vital parenting tools with wide-ranging benefits for the child, from better cognitive and psychosocial development to protection from disease and mortality. Interventions are effective in enhancing maternal responsiveness, resulting in better child health and development, especially for the neediest populations.

[a] Technically, this literature review could be described as a scoping or mapping review. This type of review provides an assessment of the literature where the aims are to identify the nature and extent of the research evidence and provide an overview of the type, extent, and quantity of research available on a given topic. By 'mapping' or categorizing existing research, this type of literature review can identify themes and trends related to a topic as well as potential research gaps and future research needs. It does not include a formal assessment of the quality of the literature.

With respect to home visitation programs and their role in ECD, evidence is reported by eight domains in which programs aim to improve outcomes: general; child development and school readiness; child health; maternal health; positive parenting practices; reductions in child maltreatment; reductions in juvenile delinquency, family violence, and crime; low income, disadvantaged mothers, families; and teen moms, at-risk moms. Key findings were summarized for each domain. For example, in the domain entitled "low income, disadvantaged mothers", several systematic reviews conclude that home visiting is considered to be a promising intervention for socially disadvantaged families with young children. Various programs are effective in mitigating various adverse early child experiences, and factors such as parental engagement, agency partnership, etc., play a role in successful program outcomes. Initiatives involving hubs, networks, and coalitions are wide-ranging, and evidence suggests that programs involving collaboration, a good mix of partners, strong leadership, and efficient structures result in better outcomes. Examples of hubs, networks, and collaborative practice from several countries and regions are included.

In contemplating features of home visiting interventions that may promote equity, research has highlighted aspects such as facilitators (e.g., accessibility of courses) and barriers (e.g., parents' resources, stigma around attending groups, accessibility of venues).

This review summarizes a wealth of information regarding healthy ECD, but to be clear, this review is not intended to be comprehensive in its scope of factors related to healthy ECD, the related evidence base or programs; it is intended to provide an overview of the evidence-based literature and a selection of community-based collaborative programs designed to improve maternal nutrition, breastfeeding attachment, , etc. In this review, evidence is assembled rather than assessed as a way to identify the diverse variety of factors, activities, and programs that contribute to healthy ECD. In addition to presenting a selection of programs tailored to address social, biological, and environmental determinants of children's health, this review includes evidence-based programs and promising practices related to material well-being, with a focus on low income, socially disadvantaged groups or families at risk. Programs range from home improvement loan programs (Norway), to partnering with bakeries to provide breakfast in schools in low income areas (US), to in-home nutrition interventions on children's dietary outcomes by relative social disadvantage (US), to toddler fairs for children's dental and hearing screening for hard-to-reach families (Canada).

Ideally, best practice programs designed for small communities that can be implemented through feasible, collaborative agency are of particular interest in this review. These programs serve to illustrate the benefits of community collaborative initiatives, including in-home visits towards the promotion of healthy ECD. Specific programs are described that could be developed to further promote healthy ECD. Other programs rated as "promising" or "good ideas" and/or implemented at a broader scale (e.g., regionally-administered) are also considered. Generally, home visiting is one of several service strategies embedded in a comprehensive, high-quality early childhood system that promotes maternal, infant and early childhood health, safety and development; strong parent-child relationships; and responsible parenting among mothers and fathers.

For this review, the scientific literature was scoped using select databases available through the University of British Columbia; grey literature was scoped mainly using online portals, resource libraries, and annotated lists. The majority of programs were identified through portals of best practices such as the Public Health Agency of Canada's Best Practices site[2] along with a variety of other peer reviewed or scholarly resources.

**Synthesis of Findings**

**Section III**

*(1) Factors that influence children's healthy development (excluding blood lead/heavy metals and chemical agents)*

**1A. Health and Safety**

With regard to the evidence pertaining to the influence of factors on early childhood health and safety, responsiveness and appropriate maternal-infant interaction foster wide-ranging benefits for the child, and interventions are effective in enhancing maternal responsiveness, resulting in better child health and development especially for the neediest populations. [3] Breastfeeding seems to have a small but consistent protective effect for children, e.g., against obesity[4] and asthma, but not for allergic reaction.[5,6,7] Breastfeeding education has a positive impact on exclusive breastfeeding rates,[8] but breastfeeding up to two years of age or beyond does not appear to have an influence on child growth and development. [9]

Improving dental health may benefit child academic achievement and cognitive and psychosocial development,[10-13] and home visiting components can improve dental literacy.[14, 15]

Prenatal distress can adversely affect cognitive, behavioural, and psychomotor development[16,17]; postpartum distress can affect cognitive and socioemotional development.[18] Early intervention with young children and caregivers living with violence provides a significant buffer and appears to be effective in enhancing children's attachment quality.[19] Sensitive parenting is important for positive development in the preschool years and can decrease internalizing problems.[20] Father's involvement has an impact on their children's social, behavioural and psychological outcomes.[21] Paternal depression may have a significant and deleterious effect on parenting behaviors. Maternal employment may have variable effects on pre-school children's health.[22] There is preliminary support for the efficacy of strength and resilience based interventions for understanding and promoting positive development in children and adolescents. The Infant Health and Development Program (IHDP) is noted as a proven practice for cognitive development at 24 and 36 months.[23]

Childhood injuries have significant impact on child health and interventions to provide information, advice or education about the prevention of unintentional injuries to children have provided mixed results.[24] Some evidence suggests that more extensive educational programs (such as health fairs and media campaigns) increase use of protective equipment to prevent childhood injury. [24, 25] Traffic calming and presence of playgrounds/recreation areas have been consistently associated with more walking and less pedestrian injury.[26] The Nurse-Family Partnership is a widely-known evidence-based program designed to address a variety of child health outcomes and it includes an injury prevention component.[27] It is listed as a best practice program within the Public Health Agency of Canada portal[27] and the HomVEE review.[28]

Interventions may improve dietary intake and parental attitudes and knowledge about nutrition for children. There is strong evidence in favor of multi-component interventions to increase fruit and vegetable consumption in children.[29] Computer-based interventions have been effective in increasing fruit and vegetable consumption; multicomponent interventions and free/subsidized fruit and vegetable

interventions appear to moderately improve fruit intake but have minimal impact on vegetable intake.[30] Interventions that target an increase in children's dairy food or calcium intake could potentially increase children's dairy food intake by about one serving daily.[31]

Parents are believed to have a strong influence on children's eating behaviours, but the resemblance appears weak and variable across studies, nutrients, foods and parent–child pairs.[32] Few studies have characterized the diets of children under five years of age and linked diet with health.[33]

Educational workshops to promote healthy food choices in early childhood education appear to be effective.[34] Community-based interventions that provide activities to engage parents may provide added benefit by improving the home food environment.[35] Evidence for the effectiveness of food subsidy programs on the health and nutrition of children is lacking.[36] Food subsidy programs for pregnant women and children should aim to focus on improving nutritional status in the longer term. In British Columbia, the B.C. Farmers' Market Nutrition Coupon Project is a program involving partnering of farmers' markets with a community agency that works to provide nutrition, cooking, or healthy lifestyle skills building programs to lower income British Columbians.[37]

There appears to be evidence for prenatal programming of childhood overweight and obesity.[38] There is no clear association between the age of introduction of solid foods and obesity.[39] Sedentary behaviors have been positively associated with weight status. Interventions to promote physical activity in children show some promise, although the amount of physical activity needed for healthy growth and development is not clear.[40]

Home-based early intervention delivered by trained community nurses has been effective in reducing mean BMI for children at age two.[41] Longer interventions that include parental participation in physical activity seem to have greater success.[42] There is a moderate level of evidence that a combined diet and physical activity intervention conducted in the community with a school component is effective at preventing obesity or overweight.[43]

Limited evidence suggests that after-school programs can improve physical activity levels and other health-related aspects.[44] Single-behaviour interventions may be most effective during these hours.[45] Active school commuters tend to be more physically active, however, evidence for the impact of active school transport in promoting healthy body weights for children and youth is not compelling.[46] As for the association of the primary school built environment (e.g., playground availability) and childhood weight, results are inconclusive.[47] The literature does not show major differences in the physical activity levels between children from rural or urban areas.[48] Where studied, the suburban built environment appears most conducive to promoting physical activity.[48] Regarding social network structure and physical activity behaviors, friendship plays an important role in shaping physical activity behaviors.[49]

Active video games increase physical activity levels in children in the short term, but whether they lead to increases in habitual physical activity or decreases in sedentary behavior, the evidence is less clear.[50] There is not sufficient evidence to recommend them as a means of increasing daily physical activity.[50] Screen-media use among young children is disproportionately high among children from lower-income families and racial/ethnic minorities, and may have adverse effects on obesity risk.[51] Effective strategies to reduce TV viewing or total screen time among children under 12 years of age include utilizing electronic TV monitoring devices, contingent feedback systems, and clinic-based counseling.[52]

Physical activity provides children with psychological and social health benefits, such as improved self-esteem, social interaction, and fewer depressive symptoms.[53, 54] Team sport seems to be associated with improved health outcomes compared to individual activities, due to the social nature of the participation.[53] Community sport participation is advocated as a form of leisure time physical activity for children, to improve physical health and to enhance psychological and social health outcomes.[53]

With respect to other aspects of children's health and safety, behavioural interventions for sleep have not been shown to decrease infant crying, prevent sleep and behavioural problems in later childhood, or protect against postnatal depression.[55]

There is consistent evidence of effectiveness for self-management education and comprehensive home-based interventions for asthma.[56-59] Home-based, multi-trigger, multi-component interventions with an environmental focus and which include home visits by trained professionals have been shown to be effective in reducing asthma visits.[60, 61]

### 1.B. Education

From early childhood through to late adolescence, education is fundamental to future outcomes of children and young people. In this review, the education domain covers pre-school and primary education and includes programs aimed at improving outcomes in academic achievement, and literacy.

Studies have documented a positive relationship between early care and education programs and child development outcomes.[62, 63] Early Head Start,[64] Sure Start,[65] Better Beginnings, Better Futures,[63] and Toronto First Duty[66] are examples of integrated approaches to early childhood services. Integration has multiple social aims including healthier parenting, work-family balance, community development, promotion of equity and social justice through effective and culturally-competent programming as well as other aims noted previously. Programs show cost effectiveness[67-71] and evidence indicates that return on public investment in the education for children in poverty or low income families is higher.[72]

There is robust evidence of the impact of family literacy, language and numeracy interventions on children's learning, particularly in the case of literacy, and these interventions can have a positive impact on the most disadvantaged families. Community-based early childhood literacy programs play an essential role in developing the literacy skills of both pre-school and school-aged children.[73] Canadian early literacy organizations do well to support early literacy development in communities.[74, 75]

In British Columbia, the Vancouver Public Library has adopted the Raising a Reader and the Parent-Child Mother Goose programs.[76, 77] In the Yukon, Canada, a Dolly Parton Imagination Library has been established to ensure that every child would have books, regardless of their family's income, similar to the intent of this literacy initiative first introduced within East Tennessee.[78, 79]

Child and parent literacy appear to be associated with important health outcomes.[80] Good written materials can increase health knowledge, and combining good written materials with brief counseling can improve behaviors.[80] Parent involvement has a positive effect on children's reading acquisition.[81] Low caregiver literacy is associated with poor preventive care behaviours and poor child health outcomes.[82]

### 1.C. Material Well-being

A family's material circumstances can exert a strong influence on children's well-being. Family income and housing are examples of material well-being that can help build an important foundation for a child's life. Lower socioeconomic status is widely accepted to have deleterious effects on the well-being and development of children.[83] Housing instability during the first five years of a child's life is significantly associated with increases in attention problems, and internalizing and externalizing behaviour, notably among poor children.[84] Population-level early interventions such as home visiting and high-quality early child care provide evidence of effectiveness in reducing developmental vulnerability, preventing developmental delay and improving school readiness.[85]

Childhood disadvantage has lasting negative effects on children's health and well-being.[86, 87] Poor children confront widespread environmental inequities.[88, 89] Children in low income households may be exposed to more family instability and they may receive less social support, have less access to books, while the air and water they consume may be more polluted.[89] Research shows small but significant effects of socioeconomic status on literacy and language, aggression, and internalizing behaviours including depression.[90] Children and young people describe aspects of family relationships, friendships and neighbourhoods that help to mitigate the impact of disadvantage on their well-being.[91, 92] Communities and advocacy groups can play an important role in promoting healthier environments for children.[93]

### 1.D. Family and Peer Relationships

Infant-mother/father relationships and children's relationships with family and peers are key to their well-being. For most infants and children, their family is the main source of security and support which fosters development in many key areas such as social and emotional competence. There is significant association between both parental control and self-regulation in preschoolers.[94] Parenting programs have the potential to improve the health and well-being of parents and children. Facilitators to engagement in parenting programs include opportunity to learn skills, using trusted or known people to lead the course, meeting others and exchanging, accessibility of the course, well trained deliverers, and barriers include competing demands on parents' time and resources, experiences of group dynamics, stigma and gender issues around attending groups, accessibility of venues.[95]

### 1.E. Participation

"*Participation in community activities provides opportunities for children to learn new skills, build community networks and express their opinions*."[96]

After-school time programs where children participate in various activities can contribute to healthy development in physical, social, and emotional realms. Out of school-time programs range from those emphasizing community leadership to sports/arts/music. Evidence of after-school programs is not sufficient to make any policy or programming recommendations, but some areas of promise do exist.[97] Regular participation in high-quality afterschool programs is linked to significant gains in standardized test scores and work habits as well as reductions in behavioural problems and substance use.[98] Social competence and cognitive/prosocial behaviour may be tapped through programs such as Big Brothers, Big Sisters, Boys and Girls Clubs of Canada, Cadets, and other mentoring-type programs.

### 1.F. Subjective Well-being

Subjective well-being draws out how children feel about themselves, others, and their environment. Examples of mental health issues include anxiety, depression or grief and loss. Various factors such as poverty, trauma, and inadequate treatment have been shown to have particular impact children's social, emotional and mental health.[99] Child anxiety prevention programs indicate that provider type can moderate program effectiveness, while program duration, participant age, gender, and program type (universal or targeted) were not found to moderate program effectiveness.[100] Chronic involvement in bullying is associated with intrapersonal, interpersonal, and academic problems,[101] and school bullying has been associated with adverse health and criminal outcomes later in life.[102] Among effective preventive interventions for behavioural and emotional problems of children, three US programs have the best balance of evidence: in infancy, the individual Nurse Home Visitation Program; at preschool age, the individual Family Check Up; at school age, the Good Behaviour Game class program.[103] Three parenting programs in England and Australia are also worthy of highlight: the Incredible Years group format, Triple P individual format, and Parent Education Program group format."[103]

### 1.G. Behaviours and Risks

Physical activity and healthy eating are examples of healthy behaviours that contribute to children's well-being. Conversely, substance abuse and aggression are risky behaviours which can have a negative effect on children's health and well-being. Parental and sibling smoking is a strong and significant determinant of the risk of smoking uptake by children.[104] Promising interventions to reduce risk behaviour in adolescents or young adults appear to be those that address multiple domains of influence on risk behaviour, and family-based interventions and combined interventions.[105] School-based interventions have been noted as effective in providing knowledge about substance use.[106]

### 1.H. Environment

Environmental drivers of health are important to elucidate, and linking the environment to adverse health children's health outcomes is critical. There needs to be adequate consideration of children's environmental health. Ongoingly, researchers are identifying statistically significant associations between various environmental agents and health, for example urinary Bisphenol A levels and measures of adiposity in children and adolescents.[107, 108] Also, there is evidence that the way a child's physical environment is designed, built, and maintained can also significantly affect the risk of disease, disability and injury.[47, 109-112]

Current epidemiological evidence suggests that early-life exposure to persistent organic pollutants can adversely influence immune and respiratory systems development.[113] Air pollution may cause adverse respiratory health effects in children and adverse pregnancy outcomes, and may contribute to infant mortality in Canada.[114] Traffic-related air pollution exposure in a child's first year of life has been associated with attention deficit/hyperactivity disorder symptoms at seven years of age.[115]

Provision of smoke-free home for children is critical as passive smoking has been implicated in deteriorating cardiovascular status in children.[116] Exposure of non-smoking pregnant women to environmental tobacco smoke" reduces mean birthweight and increases the risk of low birthweight, but has no clear effect on gestation or the risk of being small for gestational age.[117]

In order to reduce children's secondhand smoke exposure, various programs have been developed- for example, STARSS (Start Thinking about Reducing Secondhand Smoke)[118] and Smoking? Not in Mama's House![119]

The built environment has been identified as a significant determinant of health. [96, 120] Various programs have been initiated that are intended to address issues of the built environment. Many include green engineering and community designs to encourage active transportation and healthy neighbourhoods. Examples include "Safe Routes to School", "Sunday Parkways", and "Walking School Bus".[53,54] Larger initiatives include Smart Growth[121] and Child Friendly Cities.[122] Contemporary strategic planning and urban design should involve children's perspectives so that it is not child-blind.[123]

Relationships between measures of natural space and positive emotional well-being are weak and lack consistency, but modest protective effects have been observed in small cities.[124] Positive emotional well-being was more strongly associated with other factors including demographic characteristics, family affluence, and perceptions of neighbourhood surroundings.[124] Positive outcomes of school-gardening initiatives on children' health and food behavior exist, but there is insufficient evidence of improvement of children's environmental attitude or social behaviour consistently with gardening.[125] School-community gardens promote site transformation, life skills, community building, food security, school food service, curriculum developments, and infrastructure development.[126] A review of farmers' markets and community gardens on nutrition-related outcomes was inconclusive due to few well-designed studies.[127]

Growing up in a poor neighbourhood has negative effects on children. Risk of low birthweight, childhood injury and abuse, and teenage pregnancy or criminality double in poor areas. Interventions in underprivileged neighbourhoods can reduce health risks to children, especially in families that lack resources.[128] Community building and social change involves working to change policies, develop new programs, and expand capacity and partnerships to tackle issues such as affordable housing, sprawl, lack of greenspace, and more.

**Synthesis of Findings**

**Section III**

*(2) Family in-home visits aimed at improving early childhood development and children's health outcomes*

Generally, home visiting is one of several service strategies embedded in a comprehensive, high-quality early childhood system that promotes maternal, infant and early childhood health, safety and development; strong parent-child relationships; and responsible parenting among mothers and fathers. Home visiting programs may be established to prevent a range of adverse child health outcomes potentially associated with social disadvantage, while other programs may emphasize 'family wellness', including the cognitive and intellectual development of children, parenting skills and support, positive maternal mental health and use of other health services.[129]

**2.A. General** (e.g., multi-component programs; target populations, modes of delivery, etc.)

There is good evidence to suggest that home visiting can have an impact in reducing rates of childhood injury, parenting or mother-child interaction.[129] There is some evidence to suggest a beneficial impact of home visiting on measures of intellectual development in children; mental health and physical growth; breastfeeding; children's diets; detection and management of postnatal depression; improvement in maternal employment, education; nutrition and other health habits.[130]

Home visiting interventions with a comprehensive, intensive, rigourous approach that can be sustained over time with fidelity appear to be more effective than interventions with a narrow range of outcomes.[129, 131, 132] Programs delivered by professionals produce replicable effects on children's health and development.[133] Programs that reach vulnerable or at-risk families may provide more benefit. [132, 134]

A selection of evidence-based *home visiting models include: Child FIRST, Early Head Start-Home Visiting, Early Intervention Program for Adolescent Mothers (EIP), Family Check-Up, Healthy Families America (HFA), Healthy Steps, Home Instruction for Parents of Preschool Youngsters (HIPPY), Maternal Early Childhood Sustained Home Visiting Program, Nurse-Family Partnership (NFP), Parents as Teachers (PAT), Play and Learning Strategies (PALS) Infant, and Infant Health and Development Program.*

**2.B. Child Development and School Readiness** (early education, cognitive and intellectual development)

Home visiting models address child development and school readiness by engaging parents in activities designed to improve child functioning across developmental domains, educating parents about child development and strategies to enhance school readiness (such as literacy activities), promoting positive parent-child interactions, and linking families to center-based early childhood care and education experiences.

The literature indicates overall benefit of home visiting programs on school readiness and child development outcomes.[135, 136] Home visiting programs that promote high quality parent-child

relationships and combined with high-quality early education programs are most likely to result in better school readiness outcomes for children,[137] as well as show favourable economic returns.[62]

**2.C. Child Health** (birth outcomes, health care, immunizations, healthy nutrition, physical activity, obesity)

Home visiting programs that begin during a mother's pregnancy generally aim to improve birth outcomes by linking mothers to prenatal health care and providing them with information about fetal development. Postnatal programs ensure that children have access to health care, receive immunizations, etc. Some programs also provide information to parents about ways to support physical health, such as the importance of nutritious meals and physical activity.[138]

For children from disadvantaged families, home visiting programs have provided significant improvements in reduced incidence of low birthweight.[139] There is some evidence to suggest a beneficial impact of home visiting on children's diets,[129] but home visiting components provided to disadvantaged groups to encourage fruit and vegetable intake for children under five did not show significantly increased overall fruit intake in the short term.[85] School-based interventions were reported to moderately improve fruit intake but have minimal impact on vegetable intake.[140] There is little evidence that home visiting has an effect on children's current BMI, caries levels or consumption of fruit and vegetables, however, they can help increase mothers nutritional knowledge and confidence.[141]

There is some evidence that early intervention delivered by trained community nurses to target children's body mass index (BMI) is effective in reducing mean BMI for children at age two.[41] Parent–child relationships are important in explaining childhood obesity (through feeding, eating, play) and home visiting strategies should focus on interactions and influences of parent and child.[142]

With respect to home visiting components aimed at housing interventions to reduce indoor allergens and improve children's health, there is sufficient evidence that multi-faceted in-home interventions for asthma tailored to the individual are effective in controlling asthma symptoms and reducing other measures of asthma morbidity.[58, 59, 143-147] These interventions include home environmental assessment and education delivered by home visiting.

Randomized, controlled trials appear to show benefit of home visiting programs on utilization of dental services to improve dental literacy and introduce children and their families to dental prevention,[67, 68] and to reduce early childhood caries in low income populations.[148]

Home visiting programs have not been shown to be effective in increasing the uptake of immunization or hospital admission rates.[129, 149] However there is some evidence that stepped intervention of tracking and case management improves infant immunization status in a population of high-risk urban infants of low socioeconomic status.[150]

**2.D. Maternal Health** (pre- and post-natal, breastfeeding, attachment, self-sufficiency)

Home visiting programs aimed at improving maternal health provide mothers with health information and guidance during pregnancy and after the child's birth.

There is limited evidence that home visiting programs impact maternal depression.[151-156] Some visiting programs that serve low income pregnant women at-risk for postnatal depression, integrating mental health interventions into home visiting appears to be a promising approach for preventing postnatal depression.[157, 158]

### 2.E. Positive Parenting Practices (parent education and support, family functioning)

Several home visiting programs are designed to promote positive parenting practices. As to the evidence of effectiveness, many programs have demonstrated benefits and statistically significant impact.[159] Home visiting programs that include at least one postnatal visit are associated with improved quality of the home environment and improved parenting.[130, 133, 160-162]

Parenting interventions, most commonly provided within the home using multi-faceted interventions, are effective in reducing unintentional child injury, and there is fairly consistent evidence that they also improve home safety.[163-166] This evidence relates mainly to interventions provided to families from disadvantaged populations, who are at-risk of adverse child health outcomes.

### 2.F. Reductions in Child Maltreatment (abuse, neglect)

Home visiting programs designed to prevent or reduce the incidence of child abuse and neglect generally involve professionals or paraprofessionals who work with parents to improve knowledge, skills, and behaviors that are associated with maltreatment. There is mixed evidence for the performance of childhood maltreatment programs.[167] Some home visiting programs designed to prevent child maltreatment indicate some promise, but there is inconclusiveness about reductions in maltreatment and improvements in child and family well-being.[168, 169] However, rigorous research indicates that home visiting has the potential for positive results among high-risk families, particularly on health care usage and child development.[28]

Home visiting is significantly effective as a means of improving parental, child, and maternal outcomes and preventing child abuse and neglect through parenting support, improving mental health and coping strategies, etc.[170] Short-term attachment-based home visit intervention is effective in enhancing parental sensitivity, improving child security, and reducing disorganization for children in the early childhood period.[171]

In the context of Aboriginal communities and reduction of family violence, there is a low level of evidence for most visiting programs including those involving home visiting for high risk families.[172-176]

### 2.G. Reductions in Juvenile Delinquency, Family Violence, and Crime

To reduce juvenile delinquency, family violence, and crime, home visiting models may seek to reduce risky parental behaviors by addressing mental health, self-efficacy, and self-sufficiency. Many home visiting program models provide parenting education and parent-child interaction activities to strengthen parents' capacity to manage their children's behaviours and set children on a positive path, apart from juvenile delinquency. The literature provides evidence of long-term effects of nurse home

visiting on children's criminal and antisocial behavior. [177, 178 177, 178 177, 178 177, 178 177, 178 177, 178 177, 178 177, 178 177, 178 177, 178 177, 178 177, 178 177, 178177, 178]

The Better Beginnings, Better Futures program operates in eight Ontario communities and is designed to prevent young children in low income, high risk neighbourhoods from experiencing poor developmental outcomes.[63] Better Beginnings is listed as a "best practice" model within the Public Health Agency of Canada's (PHAC) Best Practices portal and it includes child-focused programs to enrich children's social and academic environments, as well as parent- and family-focused programs for parent support and education.[2] There are a number of other programs listed in the PHAC Best Practices portal related to preventing violence, such as COPEing with Toddler Behaviour, DARE to be You, Family Thriving Program, Fast Track, etc.

### 2.H. Low Income, Disadvantaged Mothers, Families

Social disadvantage can have a significant impact on early child development, health and wellbeing.[179] Postnatal home-based support programs may have benefits for socially disadvantaged mothers and their children.[139, 180, 181] Review of the Healthy Start Visit Program provided evidence that this program was able to make services more accessible to disadvantaged Chinese parents with preschool children.[182] Results indicated significant increase in child cognitive measures, child school readiness, child oral health practices; decreases in child sedentary activities, child home injury, and hospital visits; decreases in parenting stress and child behavior problems and increases in social support.

### 2.I. Teen Moms, At-Risk Moms

Teen moms, first-time moms, and at-risk moms face various challenges, and home visiting programs may focus on prenatal and postpartum health care for this population, or on providing preventive mental health intervention, etc. Home visiting for preterm infants promotes improved parent-infant interaction, but there is limited evidence regarding the outcomes of infant development, morbidity, abuse/neglect, and growth/nutrition.[183] More evidence suggests that prenatal home visiting may improve the use of prenatal care, whereas less evidence exists that it improves neonatal birthweight or gestational age.[184]

As to the effectiveness of home visiting pre- and postnatally for women with an alcohol or drug problem, there is insufficient evidence to recommend the routine use of home visits for pregnant or postpartum women with a drug or alcohol problem.[185, 186] But, home visiting programs with more frequent visitation for at-risk families had higher success rates, and in general, programs showed a positive effect on maternal behaviour.[187] Positive program aspects include providing social support, fostering parental knowledge, skill development and problem solving, and connecting parents with community resources.[187]

**Synthesis of Findings**

**Section III**

*(3) Community-based collaborative interventions aimed at improving early childhood development and children's health outcomes at a population level*

Community-based collaborative intervention involves partnerships between early childhood organizations, practitioners, government (municipalities, regional districts, province), parent groups, researchers, etc., in delivering programs to children, parents, and families.

With community-based collaborative programs, there tended to be lack of research and limitations in the research methodology to draw strong conclusions. As for collaborative partnerships, the literature provides support for their development. Early childhood intervention programs have a greater impact when there is effective collaboration between program staff, parents, and the community.[188, 189] Program models that look to build relationships across the family, the school, and the community can improve outcomes for low income and socially culturally marginalized families.[190]

Local partnerships delivering environmental interventions result in health gain, although more evidence is needed.[191] In Ontario, Child Family Centres demonstrate an increasingly coordinated and integrated system of child and families supports.[192] Integrated centres are seen as catalysts to facilitate networking of the family literacy environment which can ultimately help create more literate communities.[192]

Multi-strategy approaches, especially those which incorporate community development/coalition building and multisectoral collaboration, appear to be more effective than single strategies.[193]Child and family hubs can strengthen children's social capital in those communities with few social facilities.[194] Children's participation in consultation has become an important element of planning and community development strategies of government and community organizations.[195]

**Synthesis of Findings**

**Section III**

*(4) Features of interventions that may promote health equity or protect against increased inequities*

Regarding health equity, policies should among other things: strive to level up, not level down; focus on people in poverty only, narrow the health divide and reduce social inequities throughout the whole population; tackle the social determinants of health inequities; measure the extent of inequities and the progress towards goals; and give a voice to the voiceless.[423] A health equity and social determinants of health approach can frame many aspects of children's health and development.[140] For example, such an approach in reducing childhood obesity would involve poverty reduction, early environment initiatives, addressing neighbourhood factors, and enhancing coordination.[140] Common elements of developing programs that promote aspects of health equity appear to be collaboration, sustained funding, and leadership.

## SECTION IV: DISCUSSION

More than 200 systematic reviews were considered in this scoping review along with almost 500 intervention programs that had home- or community-based components. As a result, this review serves as a thick resource of evidence-based reviews tied to ECD and also provides useful links to online portals to search for evidence-based programs. In conducting the scoping review, some key systematic reviews stood out with regard to their contribution to broadly answering the questions regarding factors that influence healthy ECD, home visiting effectiveness, best practice community-based, collaborative intervention models, and features of programs that promote equity. For example, Evangelou et al.'s (2009) summary of the literature pertaining to early years learning and development is a comprehensive review of evidence in respect to the process of development for children and best supportive contexts for children's early learning and development.[196] Peacock et al.'s (2013) review on the influence of home visiting on disadvantaged populations provides evidence that home visiting by paraprofessionals holds promise for socially high-risk families with young children, and initiating interventions prenatally with high-frequency visits improves development and health outcomes for particular groups of children.[139] Avellar et al.'s (2013) review provides detailed evidence-based information for programs that serve pregnant women or families with children from birth to age five.[159] In Avellar et al.'s review, the HomVEE team prioritized 35 program models to determine which met established criteria for an evidence-based early childhood home visiting service delivery model.[197] The HomVEE team reported on quality of outcome measures, type of impact (favourable, unfavourable, ambiguous), duration of impacts, replication of impacts, and magnitude of impacts.

Certainly, many other foundational reviews are included and inform the global pool of knowledge in key ECD areas. Various reviews provide evidence for more specific areas, such as Gaylor and Spiker (2012)[135] and Spiker's (2012)[136] synthesis of evidence of home visiting programs on school readiness and child development outcomes, in which they concluded that there were positive impacts on young children's development and behaviour. Or, Goyal et al.'s (2013) systematic review in which they reported that home visiting for preterm infants promotes improved parent-infant interaction.[183] Or, Sellstrom and Bremberg's (2006) review which demonstrated that interventions in underprivileged neighbourhoods can reduce health risks to children, especially in families that lack resources.[128] Many more studies provide sufficient level evidence for various aspects of ECD and home visiting, although some research gaps exist. For example in considering children's nutrition, multi-component interventions and educational workshops to promote healthy food choices in early childhood education appear to be effective, and community-based interventions that provide activities to engage parents may provide added benefit by improving the home food environment but more research is needed to clarify effective community-based components and nutrition programs.

As for the question of what factors influence ECD other than lead, it is evident that the literature provides a wealth of evidence on social, biological, and environmental determinants. As for the question "What is the evidence for programs that promote ECD?", many promising practices emerged, of which nutrition, healthy eating, and activity programs seemed particularly abundant. Areas of children's health such as physical health, obesity, and nutrition have seen rapid growth in the number of intervention programs. Despite a large number of intervention programs with home- or community-based components for these health areas, the literature does not provide robust evidence of effectiveness for many specific components. The growing number of programs and focus in these areas reflects the increasing obesity trend among children and the strong interest in addressing the health issue through home- and community-based efforts. Review of the literature suggests that home visiting

strategies should focus on interactions and influences of parent and child in targeting obesity and that early intervention delivered by trained community nurses to target children's body mass index (BMI) may be effective in reducing mean BMI.[41] Active school commuting by children may increase their level of physical activity, however evidence for the impact of active school transport or participating in after-school programs in promoting healthy body weights for children is not strong.[46] Similarly, active video games increase physical activity levels in children in the short term, but whether they lead to increases in habitual physical activity or decreases in sedentary behavior, the evidence is less clear.[50] The importance of the built environment and "smart", "age-friendly" city design can exert a strong influence in children's health. Important steps in fostering healthier environments include creating partnerships in neighbourhood planning, and engaging children and families in planning processes to ensure program and service access.

In considering the evidence for community-based collaborative programs, these programs tended to be fewer in number and, in some cases, lacked a body of evidence. McClure et al. (2005)[198] and Turner et al. (2004; 2005)[199, 200] reviewed a selection of community-based programs designed to prevent injuries in children (falls, pedestrian injuries bicycle injuries, etc.) and reported that there tended to be lack of research and limitations in the research methodology to draw strong conclusions. With other studies of factors influencing ECD or home visiting interventions, common issues include lack of well-designed studies resulting in evidence that remains inconclusive. For example, McCormack's (2010) review of farmers' markets and community gardens on nutrition-related outcomes for children cited insufficient evidence because findings were hampered due to few well-designed studies.[127] Studies of interventions designed to reduce child maltreatment have not been particularly successful in establishing a strong body of evidence, to the degree that Segal (2012) suggested that evaluation should use a theory-driven approach in evaluating programs as this may decrease the variation in results.[167]

With respect to programs or components of programs intended to promote equity or mitigate inequity to pinpoint successful aspects, still further review is required to identify features of interventions that promote health equity or protect against increased inequities. Some wide-ranging evidence of practices involving hubs and networks suggests that this is a promising avenue to pursue.

All in all, a fair amount of evidence is presented in this scoping review with respect to influences on ECD, home visiting components, and intervention programs. This scoping review reveals and presents a multitude of programs that tie with factors affecting healthy child development. Several home visiting programs provide strong evidence for their positive impact on all children and families in the areas of parental education, maternal and child health, for example. Program components and structure have been investigated and a number of items important to program success have been identified such as well-trained program staff, parental engagement, program duration and sustainability, and program development that is multisectoral in nature involving a variety of stakeholders. Benefits have been experienced by socioeconomically disadvantaged children and families as well, with proportionate universality being a best practice offering accessible programs and services to all.[b]Best effort was made to review all programs found within portals, compendiums, etc., but as noted in Section II, this scoping review does not claim to be exhaustive in identifying resources. By narrowing on domains and programs of potential interest, this will allow deeper investigation of elements of programs and feasibility of collaboration and implementation in a specific community. By brainstorming goals and anticipated

[b] For more on universal proportionality, see the Human Early Learning Partnership's Proportionate Universality brief, found here: http://earlylearning.ubc.ca/documents/70/.

outcomes, and by considering which areas may resonate positively with prospective partners and groups, the way to move forward and work with the evidence can be clarified.

Some issues to consider in relation to this review include: what are current offerings for children and families in the community of Trail, apart from the continuum of services provided by THEP; has there been an environmental scan of what other agencies, organizations, and schools offer; what nutrition and activity programs are in place; does school programming offer after school activities for children and youth; have there been opportunities for children's voice at planning tables with respect to built environment or community design; what child and youth mentoring programs exist within Trail; are there municipal statistics compiled that enable detailed profiling of populations and areas within the community; what do data indicate for body weight of Trail children and their state of physical and mental health; are there community designs enabling safe routes to school; and are there Smart Growth[121] initiatives and/or Child Friendly City[201] principles in place? Depending on areas of interest of the Trail Area Health and Environment Program with regard to programs and evidence, there can be discussion of how evidence-based interventions may 'fit' goals and community of Trail.

Although there is insufficient evidence regarding some programs, it may of interest to discuss areas that have not had time to accumulate sufficient evidence – e.g., a Munchkinland Discovery Centre[202] similar to that established in Parksville/Qualicum, or Lead Free Wheels.[203] If there are evidence-based programs that require community- or municipal collaboration, it may be a future step to consider whether there are government-owned tracts of land that may be reconstituted for community or children's gardens; what government, corporation, and/or agency funding is available for partnership-based initiatives; or a horticultural society that may be open to collaborative ideas to promote food gardens; as examples.

In developing prevention programs and health promotion programs, much work is involved, and hopefully this scoping review serves as a foundational document to highlight best practices and assist pursuit of change to supplement and complement early childhood development activities within Trail.

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