Le Centre d'excellence provincial au CHEO en santé mentale des enfants et des ados



Linking poverty and mental health: A lifespan view

September 2008

Prepared by:

Ellen L. Lipman, MD
Associate Professor
Department of Psychiatry and Behavioural Neurosciences
McMaster University

and

Michael H. Boyle
Professor
Department of Psychiatry and Behavioural Neurosciences
McMaster University



TABLE OF CONTENTS

EXECUTIVE SUMMARY	4
OUTLINE	7
BACKGROUND: WHY STUDY CHILD AND YOUTH MENTAL HEALTH PROBLEMS?	9
QUESTION ONE: WHAT IS THE STRENGTH OF ASSOCIATION BETWEEN POVERTY, ASSESSED BY FAMILY AND AREA CHARACTERISTICS, AND	
CHILD AND YOUTH MENTAL HEALTH?	11
CROSS-SECTIONAL EVIDENCE Poverty measured by familial characteristics Poverty measured by area characteristics	12 12 15
LONGITUDINAL EVIDENCE Poverty measured by familial characteristics Short-term outcomes Long-term outcomes Poverty measured by area characteristics Short-term outcomes Long-term outcomes	16 17 17 18 19 19
TYPES OF MENTAL HEALTH OUTCOMES LINKED WITH POVERTY	20
ASSOCIATION BETWEEN CHILDHOOD POVERTY AND ADULT POVERTY	21
QUESTION TWO: TO WHAT EXTENT IS THE ASSOCIATION BETWEEN POVERTY AND CHILD AND YOUTH MENTAL HEALTH EXPLAINED BY OTHER VARIABLES MEASURED ON CHILDREN, FAMILIES AND AREAS?	22
RISK AND PROTECTIVE FACTORS FOR CHILD AND YOUTH MENTAL HEALTH PROBLEMS	22
MECHANISMS THROUGH WHICH POVERTY INFLUENCES CHILD AND YOUTH MENTAL HEALTH	23
VARIABLES THAT MEDIATE THE ASSOCIATION BETWEEN CHILDHOOD POVERTY AND OUTCOMES Child and youth mental health outcomes Adult health outcomes	25 25 26



VARIABLES THAT MODERATE THE ASSOCIATION BETWEEN	
CHILDHOOD POVERTY AND HEALTH OUTCOMES	27
Subpopulations identified by MCYS	27
Children from single-parent, mother-led families	27
Children of teen mothers	28
Children of families on social assistance	28
Children of immigrants	28
Youth transitioning out of foster care	29
Youth who drop out of school	29
Children and youth with physical disabilities	30
Overview	30
Subpopulations identified by intervention participation	30
LECUTE AND CARE	22
ISSUES AND GAPS	32
SUMMARY	34
REFERENCES	37
TABLE 1: SUMMARY OF SELECTED STUDIES	44
TABLE 2: INTERVENTIONS FOR AT-RISK CHILDREN	50
APPENDIX 1: LIST OF ABBREVIATIONS	51



EXECUTIVE SUMMARY

This report summarizes a literature review examining the relationship between poverty and child and youth mental health. We examined the strength (magnitude) of association (relationship) between poverty – assessed by family and area characteristics – and child and youth mental health cross-sectionally and longitudinally, and the extent to which the association is explained by other variables measured on children, families and areas.

Child and youth mental health problems are important since they are common, are associated with broad impairment lasting into adulthood for some, and have high costs to society.

There is a strong association between poverty and child and youth mental health problems. The odds of a child or youth from a family living in poverty having a mental health problem are three times that of a child from a family that is not living in poverty. This relationship is stable and consistent across countries, measures of poverty, methods of determining diagnosis and different times.

The relationship between poverty and child and youth mental health problems holds for both family-level and neighbourhood-level poverty measures.

Childhood poverty is associated with increased mental health difficulties and other difficulties when these difficulties are measured cross-sectionally or longitudinally. The effect of family poverty in the short term, such as into adolescence, is greater on academic than psychiatric outcomes. The effect of family poverty on longer-term outcomes, such as into adulthood, is greater on physical health outcomes than on mental health outcomes. The latter are more strongly associated with adult socioeconomic status (SES).

Childhood poverty is also associated with long-term adult poverty.

Studies that examine a single composite measure of child and youth mental health problems demonstrate increased prevalence of psychiatric disorders among children living in poverty versus those not living in poverty. Likewise, when the measurement of psychiatric disorder is specified more precisely, almost all types of child and youth psychiatric disorders are elevated in

children and youth from impoverished families whether disadvantage is measured at the family or neighbourhood level. Externalizing behaviours, such as conduct and oppositional behaviours, are more strongly linked to low SES than internalizing (or emotional/mood/anxiety) behaviours. This has been found for both family-level and neighbourhood-level poverty measures.

The risk factors associated with increased prevalence of child and youth mental health problems can be found on three levels – child, family and community. They are:

Child level:

- learning difficulties
- irritable or difficult temperament

Family level:

- abusive and neglectful parenting
- harsh and inconsistent parenting
- parental mental illness and substance use
- teen parenthood
- unstable home environment

Community level:

- inadequate access to health care
- isolation from supportive neighbours
- inadequate educational opportunities
- inadequate adult supervision
- association with deviant peers

Protective factors for child and youth mental health problems are easy temperament, good learning skills, good social skills and positive beliefs about the larger world at the individual level, and support from at least one consistent care-giving adult.

Multiple risk and protective factors have cumulative effects on child outcomes (increasing and decreasing difficulties respectively).





The mechanisms through which poverty influences child and youth mental health outcomes are not well understood. Poverty may have a direct influence on child morbidity. The effect of poverty is also mediated through individual factors such as trauma, family factors such as parenting, family conflict, and parental mental health, and community factors such as level of community violence. Poverty in childhood influences adult health outcomes through a variety of family and individual factors including familial liability to ill health, child and adolescent health behaviour, childhood intelligence, and childhood abuse. Adult SES (SES) has a stronger influence than childhood SES on some adult outcomes (e.g., mood and anxiety).

Specific populations of children and youth are at higher risk of poverty and of experiencing mental health problems. These include children from single-mother families, children of teen mothers, children of social assistance recipients, youth transitioning from crown-ward status, early school leavers, and children and youth with disabilities.

Single mother status moderates the relationship between poverty and child and youth mental health outcomes, with economically disadvantaged children from single-mother families faring worse than those who are from two-parent families.

Recent immigrant status (first or second generation) moderates the relationship between poverty and child and youth mental health outcomes, with children and youth whose families were recent immigrants and living in poverty faring better than those than those who were more distant immigrants.

Participation in prevention programs can also moderate the relationship between poverty and child and youth mental health outcomes. Specific programs, such as those aimed at parenting and child skills development and when children are young, have been rigorously evaluated and have demonstrated short- and long-term benefits.



OUTLINE

This document responds to a request from the Ministry of Children and Youth Services (MCYS) to the Provincial Centre for Excellence for Child and Youth Mental Health at CHEO for a literature review examining the relationship between child and youth mental health and poverty. The key research questions outlined in the Terms of Reference are:

- 1. What can we learn from the available research evidence on the correlation among the following three variables:
 - a. child and youth poverty
 - b. child and youth mental health outcomes (prevalence and nature)
 - c. poverty in adulthood?
- 2. How do these three variables impact on children's life chances as they grow into and become adults? What are the key dynamics at play?
- 3. What risk factors (individual and system level) play a significant role?
- 4. What protective factors (individual and system level), as well as best and most promising practices, have the most impact in reducing the likelihood that:
 - a. children and youth with mental health problems or illness will fall into poverty in adulthood?
 - b. children and youth living in poverty will also experience mental health problems or illness?

This document addresses the research questions outlined by the MCYS. For clarity of presentation, we have reframed the questions and organized the document as follows:

I Background

II Questions

1. What is the strength (magnitude) of association (relationship) between poverty, assessed by family and area characteristics, and child and youth mental health? This relationship will be examined cross-sectionally and longitudinally.

2. To what extent is the association between poverty and child and youth mental health explained by other variables measured on children, families and areas?

III Issues and Gaps

IV Summary and Recommendations



BACKGROUND: WHY STUDY CHILD AND YOUTH MENTAL HEALTH PROBLEMS?

Enabling children to thrive is a goal held by many. In an effort to achieve this, it is important to understand the range of problems children and youth may face. Child and youth mental health problems are among the most important impacting on healthy child development, and have been identified by some to be the leading children's health problem today¹. Child psychiatric problems involve maladaptive affective, behavioural, cognitive or physiological functioning causing impairment relative to how a child or youth is expected to be functioning given their age and stage of development². As individual children are embedded in their environment, it is important to consider the impact of home, school, peer group and community contexts when attempting to understand child psychiatric problems.

Child and youth mental health problems are important since they are common, are associated with broad impairment that does not necessarily disappear as children grow to adulthood, and have high costs to society.

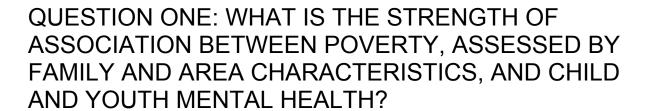
Estimates suggest that 14.3 percent of children and youth suffer from a psychiatric disorder³. This estimate is derived from a recent review of prevalence estimates of child and youth psychiatric disorder completed by Waddell and colleagues³. The authors took a careful and rigorous approach to examining the existing research in an effort to generate a figure that was representative of boys and girls in the general population, and included an accepted measure of disorder agreed upon by multiple sources, often including parents and teachers. Their review only included studies which focused on large-scale representative community samples (>1000), included children and adolescents and boys and girls, used standardized assessment procedures for symptom evaluation, assessed impairment in addition to symptoms, and included multiple informants. Other recent prevalence reviews are in line with this estimate⁴, though some experts in the field suggest an updated prevalence survey and/or an ongoing surveillance system is needed⁵. The estimate for the number of children and youth in Canada with any mental health disorder was 1,134,000³.

Children and youth who have mental health problems often have more than one disorder at the same time. Half of children and youth have co-morbid disorders³. Further, these children and youth have difficulties functioning socially, at school and in the community⁶.

Many childhood mental health disorders persist. Estimates of the proportion of children with persistent disorder through childhood range from 23 to 61 percent based on studies done in Canada, the United States, the United Kingdom, New Zealand and elsewhere⁷. Follow up ranged from two to seven years in these studies⁷. Difficulties often continue to adulthood, causing ongoing distress and mental health problems that impact adult employment, substance use and criminal behaviour⁷. Many, if not most, adults with mental health difficulties date the onset of their problems back to their teens or earlier^{8,9}.

Costs to society are high. Individuals with mental health difficulties may require assistance through the multiple sectors including the medical, legal and school systems as youngsters, and these needs may continue into adulthood. In addition, the impact on families and victims may also be considerable. For example, prevention of a single case of conduct disorder is estimated to save \$1.7 million in cumulative lifetime costs¹⁰.

Further, **child and youth mental health problems appear to be on the rise.** In the United Kingdom, increases in problems with conduct over the last three decades have been noted in multiple studies¹¹, though in Canada, available data do not support an increase over the last decade¹².



Poverty is associated with broad effects on child well-being and development. There is a substantial body of evidence linking poverty and increased rates of child and youth mental health problems above those of the general population. This link between socio-economic disadvantage and health morbidity is not unique to mental health. For example, in terms of physical health status, children from economically disadvantaged families are more likely to experience *in utero* growth retardation, perinatal complications, injuries, exposure to toxins, respiratory illness and inferior dental health in childhood ^{13,14}.

The proportion of children and youth living in poverty has risen in many developed countries. Examination of child poverty rates over the last decade shows that rates have increased in 17 of 24 OECD (Organization for Economic Cooperation and Development) countries from 0.5 to 4.3 percent¹⁵. Changes in rates in the United States, Canada, and New Zealand are -2.4, -0.4 and +2.0 percent respectively.

The relationship between poverty and child and youth mental health problems has been demonstrated across developed countries, and holds across developmental periods, varying definitions of poverty, and varying methodologies of assessing mental health outcomes. We organize an overview of the existing research with a focus on studies done using rigorous research methods, more recent research as available, to represent both cross-sectional and longitudinal evidence, as well as poverty measured by familial and area characteristics. The association between poverty and different types of child and youth psychiatric disorders is also discussed. Finally, an examination of the association between childhood poverty and poverty in adulthood is included.

In this document, poverty is primarily represented by measures of income, but other commonly accepted measures, such as employment and education¹⁶, are also included. We have examined the effects of absolute poverty (e.g., under a threshold or specific income level versus above it) on outcomes exclusively. There is evidence that income disparities (i.e., widening



income differences between the rich and the poor) also influence child outcomes¹⁷, though we did not examine this measure of poverty in this document.

Table 1 provides details of selected studies, with abbreviations described in Appendix 1.

CROSS-SECTIONAL EVIDENCE

Cross-sectional evidence is based on research that measures both poverty and child and youth mental health problems at the same time, like a snapshot or cross-section in time.

Poverty measured by familial characteristics

Adopting the same rigorous standards of Waddell and others (i.e., focus on a large-scale representative community sample, including both children and adolescents and boys and girls, using standardized assessment procedures, including assessment of impairment and including multiple informants)³ reveals three studies that demonstrate an association between poverty and child and youth mental health.

First, in Canada, data from the 1983 Ontario Child Health Study demonstrated a strong association between poverty and increased child and youth mental health problems. This study of a community sample of 2,679 youth aged four to 16 years had the objective of estimating the prevalence of emotional and behavioural disorders among Ontario children. Classification of disorder was done by specifying symptom scale scores in relation to clinical classifications of disorder provided by child psychiatrists. The odds of children and youth aged four to 16 years from a family that is economically disadvantaged (defined by any portion of the family income in the previous year in the form of social assistance) having a disorder were almost three times that of children from non-disadvantaged families (odds ratio = 2.8)¹⁸.

In the United States, Costello and colleagues surveyed all children attending public school in 11 rural counties of North Carolina in the Great Smoky Mountains Study¹⁹. This study was done in the mid-1990s, and was designed to examine the development of, need for, and use of mental health services for children and adolescents in a rural area in the southeastern United States. Psychiatric diagnoses were established using the Child and Adolescent Psychiatric Assessment



(CAPA) interview with disorder classification from the Diagnostic and Statistical Manual of Mental Disorders. Among 1,015 children and youth aged nine, 11 and 13 years, living below the federal poverty line was associated with a significantly increased prevalence of one or more mental health disorders (33.4 versus 15.9 percent) over children from families living above the poverty line ¹⁹. The odds of a child from a poor family having a disorder were 3.2 times that of children from non-poor families ¹⁹.

In Great Britain, the 1999 British Child Mental Health Survey assessed 10,438 children aged five to 15 years living in households in England, Scotland and Wales²⁰ using the Development and Well-Being Assessment instrument²¹. Rates of mental health problems varied by parental employment, with highest rates among children with neither parent working for pay (19.7 percent), followed by those with one parent working for pay (9.1 percent), followed by those with both parents working for pay (7.6 percent). The same relationship held for other measures of identifying economically disadvantaged families such as weekly household income, parent education, and social class based on occupational status (e.g., increasing prevalence of child and youth mental health problems with increasing level of poverty measure)²⁰. We calculated that the odds of a child from a family where no parent was working having any psychiatric disorder were 2.85 times that of a child from a family where a parent was working.

If the slightly less rigorous standards for study inclusion are used (e.g., eliminating one or more of the Waddell criteria³), substantially more existing research supports the association between poverty and child and youth mental health problems. For example, the Australian National Survey of Mental Health and Well-Being – Child and Adolescent Component surveyed 4,509 children and youth aged four to17 years²². Children with a mental health problem in the clinical range on a standardized classification system for disorder (Child Behaviour Checklist), as well as those with behaviours falling close to, but just below the threshold for the clinical range, were significantly more likely to come from families in poverty (measured by household income less than \$500 per week) ²². Impairment was not measured in this survey. In the United States, Currie and Lin investigated the relationship between poverty and overall health status using data from a nationally representative data set (National Health Interview Survey, 2001-05 sample, over 44,000 children aged two to 17 years) ²³. Children from impoverished families were more likely to be rated by their mothers as having a mental health condition than children from families who were not impoverished (11.9 percent poor versus 7.9 percent non-poor) or as



having difficulties such as worries, low mood, trouble with social interactions with children, and attention difficulties (for children and youth aged four to 17 years only, 2.23 difficulties for poor versus 1.69 for non-poor) ²³. This study did not use a standardized assessment procedure.

The results of this approach to examining the association between poverty and child and youth mental health disorders, using clear and rigorous criteria for inclusion of studies, show a clear elevation in the prevalence of psychiatric disorders among children from economically disadvantaged families compared with children from families that are not economically disadvantaged. The odds of a child from a poor family having a psychiatric disorder are about three times that of a child from a non-poor family. The magnitude of this association would be considered large²⁴. This relationship holds across countries, measures of poverty (using income, employment, education measures), and across data collected at different times (1983-1999).

One other specific more recent Canadian survey deserves mention. Data examining the association between poverty and child and youth mental health problems are available from the National Longitudinal Survey of Children and Youth (NLSCY), a large-scale prospective study of Canadian children aged 0 to 11 years which began in 1994 to better understand the characteristics and life experiences of children and youth as they grow from infancy to adulthood. Among four- to 11-year olds, Offord and Lipman found increased rates of one or more psychiatric disorders were found as family income (defined as percentage of low income cut-off or LICO) decreased, with almost one-third of children who were very disadvantaged (defined as family income below 75 percent of the LICO) identified as having one or more emotional or behavioural disorders²⁵. The definition of disorder in this study does not arise from a standardized assessment procedure. Offord and Lipman defined disorder as a top 10 percent on any of the individual disorders (conduct disorder, hyperactivity, emotional disorder)²⁵. Boyle and Georgiades also examined the impact of socioeconomic disadvantage (defined by income below the low income cut-off or LICO) on child outcome (defined by mean scores on 20 NLSCY behaviour items derived from the Ontario Child Health Study) using the 1994 NLSCY data². They found that mean level of emotional-behavioural problems was greater among children aged four to 11 years in families with income below the LICO versus those above the LICO (mean problem rating: 8.1 versus 6.6). These more recent data replicate the finding of increased

0

prevalence of emotional and behavioural problems among children from economically disadvantaged families compared to those from families who are not disadvantaged.

Poverty measured by area characteristics

Community effects are often operationalized as neighbourhood effects. The effects of neighbourhood on behaviour have been conceptualized as occurring through three processes: institutional resources (such as schools and recreation), quality relationships within and between families, and norms or collective efficacy²⁶. The latter term refers to the link between mutual trust among residents and willingness to intervene for the common good (e.g., monitor and intervene as necessary on groups of children playing²⁷). The latter represents social organization, both formal and informal, that assists with control of deviant and violent behaviour. Researchers recognize that children and families are not randomly assigned to neighbourhoods, but that there is a selection process that contributes to where families live²⁸. As such, increasing control for family characteristics decreases the strength of contribution of neighbourhood variables to child outcomes.

Xue and colleagues provided prevalence estimates by neighbourhood SES in their examination of the influence of neighbourhood on internalizing disorders among almost 3,000 children aged five to 11 years living in Chicago²⁹. When neighbourhoods were classified as low, medium or high SES based on annual family income plus assistance receipt and education, mean ratings of child internalizing behaviours were highest among children in low-SES neighbourhoods (8.41 versus 7.86 and 6.22 for medium- and high-SES neighbourhoods respectively). Children with internalizing scores in the clinical range were also more common in low-SES neighbourhoods (21.5 percent in clinical range versus 16.3 and 11.5 percent for medium- and high-SES neighbourhoods respectively)²⁹.

A comprehensive review of the impact of neighbourhood residence on child and adolescent outcomes, including mental health outcomes, concluded that there is evidence for a neighbourhood impact on emotional and behavioural problems with children living in low-SES neighbourhoods exhibiting more mental health problems, even after accounting for family variables²⁶. Difficulties with externalizing (e.g., aggression) were more strongly linked with low-SES neighbourhood conditions than internalizing (e.g., mood) symptoms²⁶. No Canadian



studies were included in the review. Studies also suggest that the effects of neighbourhood disadvantage may be stronger and more consistent among adolescents than among young children²⁸.

In a more recent Canadian study, Boyle and Lipman examined the influence of neighbourhoods and socioeconomic disadvantage on behavioural problems rated by parents and teachers in the four- to 11-year-old children in the 1994 NLSCY²⁸. Neighbourhood influence was measured by percentage of lone-parent families and a neighbourhood disadvantage index (derived from percentage of neighbourhood income from government transfer payments, percentage of neighbourhood population 15 years and older without a secondary school certificate, mean household income, percentage of neighbourhood families with income below the poverty line and percentage of neighbourhood population 15 years and older who were unemployed). They found that about seven percent of variation in behavioural problems was associated with neighbourhoods, though this was reduced when parent and family variables were taken into account²⁸. This pattern of variation held across conduct, hyperactivity and emotional problems. The authors emphasized that while the neighbourhood effect estimated is not large, it is in line with other studies, and it is not necessarily trivial since unmeasured neighbourhood processes may have a substantial impact on outcomes.

LONGITUDINAL EVIDENCE

Longitudinal evidence is based on research that measures poverty at one point in time and outcomes at a later time. The ability to assess the impact of poverty during childhood on later outcomes depends upon the ability to follow a representative sample of children over time, without substantial sample loss.

Using poverty measured in childhood as the initial point in time for most studies, both short-term outcomes (measured in later childhood or adolescence) and long-term outcomes (measured in adulthood) are considered. Longitudinal outcomes are considered more broadly and include physical and mental health as well as educational and employment outcomes.



Poverty measured by familial characteristics

Short-term outcomes

Poverty during childhood can affect a broad range of outcomes in later childhood or adolescence. Offord and colleagues examined children who were four to 12 years old in 1983, four years later at ages eight to 16 years (as part of the Ontario Child Health Study follow-up in 1987) 30. Among children without a disorder in 1983, low income (family income <\$10,000 in 1982) significantly predicted the presence of one or more psychiatric disorders in 1987. In a separate study using the same data set, multiple poverty indicators (low income and income below the Statistics Canada LICO) among children aged eight to 11 years significantly predicted academic and psychiatric difficulties four years later. This relationship was stronger for other non-psychiatric difficulties (e.g., academic difficulties) than for psychiatric difficulties 31.

Using results from multiple studies examining the longitudinal relationship between family income and child outcomes, Brooks-Gunn and Duncan concluded that the effects of family income on child ability and achievement were generally large, but effects on behaviour, mental health and physical health were smaller³². For example, the effects of family income measured in middle childhood were large on standardized reading and math scores, but small or moderate on fighting in middle childhood, and not detected on anxiety or hyperactivity at the same stage³². Family economic conditions earlier in life (early and middle childhood) were more important in influencing achievement than during adolescence³².

As the length of time that families live in poverty increases, the mental health disadvantages of children increase³³. Children living in circumstances of persistent poverty appear to do worse than those with transitory poverty in terms of socio-emotional functioning, IQ and school achievement ¹⁴. In terms of specific mental health disorders, which disorders are influenced more greatly by persistent versus current poverty is not clear. Based on data from a large national United States study (Children of the National Longitudinal Surveys of Youth), McLeod and Shanahan found that persistent poverty (years in poverty from 1979 to 1986) predicted internalizing symptoms in children in 1986 above and beyond the effects of current poverty, though current poverty predicted externalizing symptoms³⁴. In another analysis using later data from this data set (1986, 1988, and 1990), children who lived in circumstances of persistent

poverty (1986 to 1990) were more likely to show persistent mental health problems, specifically antisocial behaviour, than those with transient or no poverty³⁵. This relationship did not hold for depression.

Timing of exposure to poverty is also important. Studies suggest that negative effects of parent low income are more severe when children are young, compared to during later childhood or adolescence.

Long-term outcomes

Links between low SES during childhood and adult outcomes have been demonstrated. This has been most clearly demonstrated by the Dunedin Study, follow-up of a birth cohort of children (born between April 1972 and March 1973) to adulthood³⁶. Researchers examined the association with child and adult SES and a broad range of adult health outcomes (including physical health, dental health, mental health and substance use) at age 26 on 972 adults (>95 percent of original birth cohort who were still living). Low childhood SES was associated with long-lasting negative health effects. Physical and dental health outcomes varied with childhood SES (i.e., worst health with low SES, improving health as SES increased). Adult mental health and substance use outcomes were not strongly linked with low childhood SES, but were more strongly associated with adult SES. Persistent low SES was associated with inferior outcomes on physical and dental health measures. Others have examined the association between childhood SES and a narrower range of adult health outcomes, with similar findings (e.g., cardiovascular health³⁷).

In addition, socio-economic disadvantage in childhood has been associated more broadly with more difficulties in adulthood. Socio-economic disadvantage, measured by low social class based on parental occupation measured at ages seven, 11 and 16 years, was associated with self-rated ill health, malaise (indicative of low mood), psychological morbidity, and short stature assessed at age 23 in men and women. Results for psychological morbidity were less consistent than for other health outcomes³⁸.



Poverty measured by area characteristics

Short-term outcomes

Several studies have demonstrated the neighbourhood characteristics earlier in life that can impact later outcomes. Xue and colleagues examined the influence of neighbourhood on internalizing disorders among almost 3,000 children aged five to 11 years living in Chicago²⁹. Neighbourhood characteristics were specified using data from the 1990 United States Census and a 1994 survey asking residents about community characteristics. Child outcome data were collected in 1997-98 ²⁹. Neighbourhood characteristics (concentrated disadvantage including poverty rate, percentage of residents receiving public assistance, percentage of female-headed families, unemployment ratio and percentage of African American residents) were significantly associated with increased mental health problems and likelihood of mental health problems above the clinical threshold, after adjusting for child and family background ²⁹. In a longitudinal study of antisocial behaviour of boys in Pittsburgh, Loeber and colleagues found a negative influence of living in a disadvantaged neighbourhood on the course of difficulties with delinquency and offending behaviours³⁹.

Long-term outcomes

There is some support for neighbourhood characteristics early in life influencing outcomes in adulthood. Boyle and colleagues examined neighbourhood influences on educational attainment using data from the 1983 Ontario Child Health Study and 2001 follow-up study. Neighbourhood influences were measured in 1983 when children were four to 16 years old and adult outcomes were measured 18 years later in 2001 when participants were 22 to 34 years of age. Results of this study demonstrated a significant effect of neighbourhood on outcome, with neighbourhood affluence (based on household income, percent of population in managerial/professional occupations, and percent of population with high school or university degrees) significantly associated with outcome even after controlling for other child and family characteristics. Neighbourhood disadvantage (based on percentage of families headed by lone parents and percentage of families living in rental accommodations) was not associated with outcome⁴⁰.



TYPES OF MENTAL HEALTH OUTCOMES LINKED WITH POVERTY

While the rate of a composite measure of one or more psychiatric disorders is elevated among economically disadvantaged children¹⁸, a number of studies have examined specific types of mental health outcomes and their association with poverty. Two findings emerge from this work.

First, some studies suggest that the prevalence of almost every type of disorder is elevated among poor children. Costello and colleagues examined the prevalence of 29 separate diagnostic categories and found that the most economically disadvantaged families were at increased risk of every type of diagnosis except tic disorders ¹⁹. Boyle and Lipman found that multiple types of child and youth psychiatric morbidity (conduct, hyperactivity, and emotional problems) were significantly associated with both family and neighbourhood measures of disadvantage in the National Longitudinal Survey of Children and Youth, though family disadvantage was more weakly linked with emotional problems²⁸.

Second, poor children appear to be at greatest risk for behaviour disorders, including conduct problems and oppositional and defiant behaviours. Costello and colleagues calculated that the highest risk of a disorder for children from economically disadvantaged families compared to children from non-disadvantaged families was for any behaviour disorder, with the odds of a poor child having any behaviour disorder 2.7 times that of a non-poor child 19. Similarly, in Great Britain, Meltzer and colleagues found that conduct disorders were the most frequent mental health disorders among disadvantaged children across measures of poverty (e.g., gross weekly household income, social class) 20. For example, using occupational status to measure social class as a measure of poverty, the prevalence of conduct disorders was 10.1 percent, greater than those for emotional disorders (5.8 percent), "hyperkinetic" disorders (1.3 percent) and other disorders (0.8 percent). Further, among families classified as never working, the prevalence of conduct disorders was 15.5 percent, greater than the prevalence measured for all other disorder categories. Findings from other studies are also consistent with this⁴¹.

Both biological/genetic and environmental factors influence the expression of psychiatric disorders, or more broadly, mental health problems in children. Though conduct disorder is



more strongly associated with low income than are other mental health disorders, it would be simplistic to assume that environmental factors are more important than biological factors in the manifestation of this disorder. For conduct disorder, genetic factors have been shown to play a prominent role though environmental causes are also important ⁴². The most current research in behavioural genetics has demonstrated increasing recognition of the complexity of geneenvironment interactions, including that a child's sensitivity to specific environmental factors may be moderated by their genotype (e.g., ⁴³).

ASSOCIATION BETWEEN CHILDHOOD POVERTY AND ADULT POVERTY

Economists have investigated the impact of childhood poverty on adult poverty, conceptualized as adult earnings. U.S. studies calculate that growing up persistently economically disadvantaged increases the probability of long-term poverty in adulthood by up to eight times⁴⁴. Children who grow up in persistently poor households have reduced earnings as adults, amounting to about \$170 billion per year⁴⁵. However, interrupting this cycle will not eliminate adult poverty, as a portion of children from non-disadvantaged households grow to be poor adults⁴⁶.

As well, given the association between childhood poverty and child psychiatric disorder, and the potential for suboptimal adult outcomes, both due to the persistence of psychiatric disorders and associated impairments as well as due to adult physical health morbidity, it is plausible that children who have been poor during childhood are at increased risk of being impoverished adults due to physical and psychiatric morbidity.

QUESTION TWO: TO WHAT EXTENT IS THE ASSOCIATION BETWEEN POVERTY AND CHILD AND YOUTH MENTAL HEALTH EXPLAINED BY OTHER VARIABLES MEASURED ON CHILDREN, FAMILIES AND AREAS?

RISK AND PROTECTIVE FACTORS FOR CHILD AND YOUTH MENTAL HEALTH PROBLEMS

A number of general risk and protective factors for child and youth mental health problems have been identified. In addition to family and neighbourhood poverty, general risk factors for negative child outcomes have been identified at the child, family and neighbourhood/community level. Risk factors at the child level include learning difficulties and irritable or difficult temperament⁴⁷. Family risk factors include abusive and neglectful parenting or parenting that is harsh and inconsistent, parental mental health problems and substance abuse, teen parenthood and an unstable home environment. Community factors include inadequate access to health care, isolation from supportive neighbours, inadequate educational opportunities, inadequate adult supervision and association with deviant peers⁴⁷.

Protective factors for children can also be conceptualized at multiple levels. Individual characteristics include an easy temperament, good learning skills, good social skills, a sense of competence, and positive beliefs about the larger world. Children who are resilient and who are able to adapt and to cope successfully with adversity share these characteristics. Broader factors include long-term support from at least one consistent caregiving adult⁴⁷.

There is evidence that the presence of multiple risk factors is particularly detrimental to child well-being. The cumulative effect of multiple risk factors has been examined for behavioural, cognitive and physical health outcomes⁴⁸⁻⁵⁰ and the cumulative impact is much greater than for any one risk factor alone. For example, Larson and colleagues examined the association between an eight-factor social risk index (parent education high school or less, family income less than 200% of the poverty line, single-parent household, black/Hispanic race, no health insurance, family conflict, maternal mental health problems, and unsafe neighbourhood) and



child global health, dental health, socio-emotional health and overweight. Children with six or more risk factors had a 17-fold increase in the odds of having inferior health, an 11-fold increase in inferior dental health and an almost five-fold increase in inferior socio-emotional health⁵⁰. As factors retain independent association with outcomes in analyses, this suggests that each factor may represent a source of health vulnerability that is unique. Regrettably, many of the children and youth experiencing poverty are under the influence of multiple risk factors.

Similarly there is evidence that multiple protective factors have an impact greater in combination than individually, as has been demonstrated by Coleman and others^{51,52}. For example, Coleman created a measure representing social capital or social connectedness with communities and families (two-parent household, one versus four siblings, fewer school changes before Grade 5, regular attendance at religious services, and high maternal expectations of child educational achievement) and found that these variables distinguished between adolescents who stayed in school and those who dropped out, and were stronger in combination⁵².

Beyond the identification of specific risk and protective factors for child and youth mental health outcomes, it is important to understand how these factors, and others, interact to influence the relationship between poverty and child and youth mental health outcomes.

MECHANISMS THROUGH WHICH POVERTY INFLUENCES CHILD AND YOUTH MENTAL HEALTH

A number of theories have been proposed to link poverty to child well being¹³. In addition to a direct effect of poverty on children, poverty may influence child outcomes through inadequate access to material and social resources, such as nutrition, access to health care, housing, cognitively stimulating materials and experiences, parental expectations and styles, and teacher attitudes and expectations. Poverty may also influence child outcomes through reactions to stressful conditions by the parent and child, including the influence of stress on parental physiology and parenting, and on the child's physiological response to environmental stressors. Further, poverty may influence child well being through behaviours that are relevant to health and lifestyle, such as substance use, diet and exercise. It is not possible to precisely determine the processes though which poverty influences child well-being, so these mechanisms are not well understood.





There is evidence of direct effect of poverty on child and youth mental health outcomes. Costello and colleagues examined the prevalence of a variety of child and youth mental health problems among children and youth aged nine to 13 years from American aboriginal and white families over an eight-year period in the Great Smoky Mountain Study⁵³. In the middle of the follow-up period a casino opened on the aboriginal reservation that led to an income supplement that increased annually for those families. Among families that moved out of poverty, rates of conduct disorder and oppositional behaviour fell to those of families that were never in poverty, whereas rates had previously been at those of persistently poor families. This effect was not found for anxiety and depressive disorders. The results of this study support a direct effect of income on specific child and youth mental health problems, specifically conduct and oppositional disorders.

As well as poverty having a direct influence on outcome, the influence of poverty may vary depending on other variables. For example, the influence of poverty on child and youth mental health may be partially or fully explained by another variable acting as a mediator, e.g., a variable that explains how or why poverty influences outcome⁵⁴. Mediator variables account for a portion of the impact of poverty on child and youth mental health outcomes, so decrease the magnitude or strength of association between poverty and the mental health outcome. Other variables, called moderators, specify on whom and under what conditions poverty influences mental health outcomes⁵³. Moderator variables are independent of the outcome. Though mediator and moderator variables are presented here as single, unique variables, there likely are complex interactions between multiple mediator and moderator variables with respect to their influence on child outcomes⁵⁴. As Bradley and Corwyn suggest, it is difficult to disentangle the effect of poverty from other conditions, often multiple conditions, that frequently co-occur that affect children or those that exacerbate the effects of poverty on child outcomes¹³.

In the following three sections we focus on mediators of the effect of poverty on child and youth mental health outcomes, the mediators of the effect of childhood poverty on adult outcomes and moderator variables.

VARIABLES THAT **MEDIATE** THE ASSOCIATION BETWEEN CHILDHOOD POVERTY AND OUTCOMES

Child and youth mental health outcomes

A number of variables have been identified as mediators of the relationship between poverty and child and youth mental health problems. Children who grow up in poverty are frequently exposed to trauma that may mediate the relationship between poverty and mental health problems^{14,55}. Family factors such as family conflict, maternal mental health and depression, and lack of health insurance are all associated with difficulties with child health outcomes, with some association that is independent of family income or other measures of SES⁵⁰. For example, mothers living in poverty may be more distressed and depressed due to their circumstances, which may lead to inconsistent or harsh parenting practices and difficulties with child mental health adjustment. Broader community factors, such as the level of community violence, have also been associated with difficulties with child outcomes even when accounting for the impact of poverty.

Family processes have been investigated as a mechanism through which poverty may influence child outcomes. Specific family processes identified vary according to the question under investigation and the family process variables included in the analyses. For example, McLeod and Shanahan examined the relationships between poverty (current and persistent), parenting, and child mental health using data from a 1986 national data set (Children of the National Longitudinal Survey of Youth)³⁴. Inadequate maternal responsiveness and use of physical punishment frequently mediated and explained the relationship between current poverty on mental health, but did not explain the relationship between persistent poverty and mental health³⁴. Poverty may also decrease the ability of parents to be consistent and involved with their children resulting in maternal psychological distress and child behavior problems⁵⁶.

Using data from the NLSCY, Beiser and colleagues examined the relationship between poverty, family processes and mental health among children aged four to 11 years who were themselves immigrants to Canada, those who had immigrant parents and those who were non-immigrants ⁵⁷. They found that the effect of poverty was indirect and mediated by single parent status,



ineffective parenting, parental mood problems and family dysfunction. For immigrant children, the effect of poverty on emotional and behavioural problems remained even after accounting for the effects of family processes, and ineffective parenting mediated the effect on outcome⁵⁷.

Other mechanisms linking childhood SES to child well-being have been proposed. These include resources such as nutrition, child physical health status, housing, cognitively stimulating materials and experiences, parent expectations and styles, teacher attitudes and expectations, reactions to stress and parenting, and lifestyle or healthy behaviours (e.g, ^{13,14}).

Adult health outcomes

Factors contributing to increased health morbidity in poor children grown to adulthood have been identified and overlap with risk factors for childhood disorder. Melchior and colleagues examined the mechanisms by which children from socioeconomically disadvantaged families became adults with health morbidity using the Dunedin birth cohort followed to age 32 years⁵⁸. Low childhood SES (based on occupational prestige) was significantly associated with some of the inferior outcomes measured in adulthood, including substance dependence (alcohol or drug, tobacco) and cardiovascular risk, but not with adult major depressive disorder or anxiety disorder⁵⁸. For example, for adult alcohol or drug dependence, the contribution of low SES in childhood to outcome was mediated in different models by familial liability to ill health (i.e., parent had a drug or alcohol problem), adolescent alcohol or drug use, and adult SES. In general, the factors mediating the relationship between childhood SES and adult health were familial liability to ill health (substance use or cardiovascular status), child and adolescent health characteristics (including substance use, body mass index), low childhood IQ, exposure to child maltreatment and adult SES⁵⁸. The strength of this study lies in the measurement of all of the variables, except the adult outcome, in childhood.

Bures examined a nationally representative United States sample at mid-life (25 to 74 years of age). In this study, adults were asked about their early life experiences and their subjective rating of global and mental health at the same time. While childhood poverty was correlated with each outcome, the association between poverty and subjective global health was mediated, and made non-significant, by the protective factors of residential stability (moved two or fewer



times), strong neighbourhood support, and good social support. Mental health was associated with social and community support⁵⁹.

VARIABLES THAT **MODERATE** THE ASSOCIATION BETWEEN CHILDHOOD POVERTY AND HEALTH OUTCOMES

Moderator variables specify on whom and under what conditions poverty influences mental health outcomes⁵⁴. Moderator variables are independent of the outcome. Examination of moderator variables allows identification of specific subgroups for which the strength of relationship between poverty and child and youth mental health problems varies.

Subpopulations identified by MCYS

Specific subpopulations of children and youth who experience poverty and who are of interest to the MCYS include children and youth in female-led lone-parent families, children of recent immigrants, children of social assistance recipients, youth transitioning from crown-ward status, early school leavers, and children and youth with disabilities.

Children from single-parent, mother-led families

Children from single-parent families, usually single-mother families, have higher rates of mental health problems than children from two-parent families⁶⁰. There are many pathways to single motherhood (e.g., unplanned pregnancy, separation or divorce, spousal death, choice to become a single mother such as through adoption), though many single mothers are economically disadvantaged. Examination of the association between childhood poverty and health outcomes for children has demonstrated that among economically disadvantaged children, those who live in single mother-led families do worse than those in two-parent families who are poor⁶¹.



Children of teen mothers

Children of teen mothers also have higher risk of emotional and behavioural problems. This applies to all children born to teen mothers, not just children born when the mother was under 21 years of age⁶².

Children of families on social assistance

Children in families on social assistance are also at elevated risk for morbidity in outcomes such as psychiatric disorder and difficulties with school performance⁶³.

Children of immigrants

Examination of the association between childhood poverty and health outcomes suggests that first- and second-generation children appear to be protected from the mental health difficulties commonly associated with poverty. Canadian research has demonstrated that children from recent immigrant families who are economically disadvantaged do better than children of longer standing immigrants or non-immigrants. Georgiades and colleagues examined the influence of immigrant status on emotional (mood, anxiety symptoms) and behavioural (conduct problems and hyperactivity) outcomes using data from the 1994 wave of the Canadian NLSCY⁶⁴. Among children aged four to 11 years, the effects of both neighbourhood disadvantage (measured by lone-parent led families, percentage of families living in rental dwellings, and mean family income) and family poverty (ratio of household income to Statistics Canada LICO) on child mental health outcomes were significantly decreased when immigrant status (15 years or less in Canada) was included in the model, and accounting for family process risk factors (maternal depression, family dysfunction, and hostile parenting). This relationship did not hold for immigrants who had been in the country for more than 15 years.

However, it is noted that our understanding of immigrant children is incomplete. About 20 percent of immigrant children are refugees, and their risk of mental health problems is not known. The profile of immigrants coming to Canada is changing, with more visible minorities, and the changes in the relationship between poverty and mental health problems among immigrants may result. It is possible that newer immigrants have been exposed to more trauma, and it is documented that exposure to trauma, such as violent and stressful events in their



country of origin, is associated with elevated psychological and psychiatric problems in immigrants⁶⁵. Immigrants are also more likely to be economically disadvantaged now than they were 10-15 years ago. Our knowledge about high-risk immigrants is also further impeded by the fact that past studies, such as the NLSCY, may have systematically excluded higher-risk immigrants.

Youth transitioning out of foster care

Adolescents transitioning out of foster care and out of the child welfare system are considered to be a small, but vulnerable, population. Many have complex health needs, including chronic medical problems, and emotional and behavioural problems. These children have often been exposed to trauma in their family of origin home, and may experience multiple moves during their time in the foster care system⁶⁶. Youth in foster care frequently have mental health problems, including post-traumatic stress disorder, substance use and depressive symptoms^{67,68}. At the end of their time in the foster care system, they are expected to move to independent living, though many have few financial, personal or family connections or resources to assist them. Compared to children not in foster care, youth transitioning out of foster care are more likely to have not completed high school and be unemployed. All of these factors place these adolescents at higher risk of poverty in adulthood, including homelessness, substance use, and contact with the law⁶⁹.

While no specific studies were identified examining the relationship between poverty and mental health among youth while in foster care, the Maltreatment and Adolescent Pathways Project is currently underway (funded by the Ontario Ministry of Children and Youth Services). Preliminary work available from this study does not address the specific questions of this review^{67,68}, but later data should be able to provide information on the relationship between poverty and mental health within this population, and follow-up of these youth as they transition out of foster care.

Youth who drop out of school

Youth who drop out of school are at elevated risk for lower paying jobs, unemployment, and receipt of social assistance⁷⁰. Young women who drop out of school are more likely to be single parents and to have children at younger ages. Childhood poverty, mental health problems and



learning disabilities are just a few of a range of individual, school, family and community factors that have been identified to elevate the risk of dropout. No specific studies were identified examining the relationship between poverty and mental health among youth dropping out of school versus those who stay in school.

Children and youth with physical disabilities

Children with physical disabilities and chronic health problems have been identified as having elevated levels of psychiatric problems¹⁸.

Overview

Most of the specific populations who experience poverty and that are of interest to MCYS are at elevated risk of child and youth mental health problems. However, our literature search did not identify studies examining the specific question of whether inclusion in the sub-population moderated the relationship between poverty and child and youth mental health outcomes.

Subpopulations identified by intervention participation

Another method of sub-grouping populations of children living in poverty is to examine those receiving an intervention for treatment or prevention and their mental health outcomes compared to those not receiving the intervention. Three approaches to assisting children with mental health problems have been identified⁷¹. Universal programs are directed at entire populations, so avoid labelling children but can be expensive to deliver. Targeted programs are aimed at children and families identified as at risk, so may expose children to stigma but are more efficient. Clinical programs identify children with difficulties but have inadequate coverage and deal with children one at a time so are expensive to deliver. We focus on targeted programs aimed at at-risk children and families (i.e., children exposed to poverty who are at higher risk of developing a mental health problem) given that the focus of this review is the link between poverty and child and youth mental health problems.

A number of studies have demonstrated that delivery of programs to at-risk children, including economically disadvantaged children, have a significant impact on mental health outcomes. Waddell and colleagues reviewed high-quality trials published over the last two decades aimed



at preventing the common child psychiatric disorders conduct disorder, anxiety and depression⁴⁷. Table 2 provides a brief description of these programs. Program evaluations were done using well-designed randomized controlled trials, which provide a high level of research evidence. Four programs were identified that were aimed at economically disadvantaged children and effective in the prevention of conduct disorder (Nurse Visitation, Perry Preschool, Fast Track and Johns Hopkins) ⁷²⁻⁷⁵. All programs were aimed at young at-risk children aged 0 to seven years (Nurse Visitation, 0-two years; Perry Preschool, three to four years; Johns Hopkins, five to seven years; Fast Track five to seven years). Each program included parent training or child social skills training. Parent training covered healthy child development and parent-child interactions. Child social skills training included training on communication, problem solving, impulse control and social skills/friendship building. Both symptoms and new cases of conduct disorder were reduced, with positive outcomes maintained up to 23 years following the program. Other programs demonstrated effectiveness but with shorter term follow-up⁷⁶.

In a separate study, Nelson and colleagues examined 34 preschool prevention programs for disadvantaged children and families. The size of cognitive impact of these programs varied across programs, but overall was considered to be medium and greatest during the preschool period. There were continuing smaller effects through to Grade 8. The socio-emotional impacts were small in kindergarten to Grade 8, and were maintained though high school. Socio-emotional impacts included behaviour and social skills, and self esteem. Positive effects on parent-family wellness were also noted in the preschool years and up to Grade 8 (e.g., parent-child relationships, family functioning, parent mental health, social support). Program length (classified as greater than one year versus less) and intensity (classified as greater than 300 sessions versus fewer) were both related to positive outcomes⁷⁷.

A number of preventive programs, delivered during the preschool years and later, appear to moderate the effect of poverty on child and youth mental health disorder, and participation in these programs may have long-term positive impacts. Implementation of such effective prevention programs could assist Ontario children.



ISSUES AND GAPS

It is important to recognize some of the difficulties associated with answering the questions in this review. These pertain to the quality of studies available, sorting out the issue of causation, allowing for measurement error and developmental periods, and defining mental health and disorder.

In terms of the quality of studies available for this review, our estimates of the association between poverty and child and youth mental health and other estimates included in this document are only as reliable as the studies we chose to include in this review. The scope of the review specified a summary and synthesis of available research evidence with attention to evaluative studies. As such, we have not provided an exhaustive or systematic review of the literature. Care was taken to select high-quality studies for inclusion, such as selecting studies with strong methodology and examining representative populations, studies providing information relevant to the issues of interest, and those done by investigators who are well-established in the field and those that are published in high-quality journals.

Over the course of preparation of this review, the question of whether some of the studies available for this review are sufficiently recent to reflect the current relationship between child poverty and child and youth mental health problems was raised as some data are more than 20 years old. While the studies included reflect those that are most recent with suitable strong methodology, updated estimates of the relationship between poverty and child and youth mental health outcomes could be estimated by conducting specific analyses using the NLSCY and OCHS. Both data sets have high relevance to the Canadian situation, can be accessed by researchers and analyses can be configured as required. Analyses could be replicated in both data sets, as data are available, to allow comparisons over time as well as to minimize any specific drawbacks of each data set (e.g., lack of standardized, validated assessment procedure in NLSCY). Some experts in the field suggest an updated survey or an ongoing surveillance system is needed to allow firmer conclusions about prevalence⁵. As well, it is noted that if we are interested in the relationship between child poverty and adult health outcomes, we will require data collected over many years to allow these estimates to be undertaken.

The issue of causation is also important to consider. Is poverty a causal risk factor for child and youth mental health problems? Are child and youth mental health problems a causal risk factor for adult poverty? Arguments have been put forward to support both questions. We attempt to clarify this issue using a scientific approach. To be a causal risk factor, a variable must be associated with the outcome of interest, precede the outcome, be amenable to change, and there should be evidence that manipulating the variables changes the outcome⁷⁸. Note that both longitudinal studies and some type of action or intervention are required to establish causal risk factors, such that it is clear that the risk factor precedes the outcome and that manipulating the variable leads to change in the outcome. Though this definition of causation is considered too restrictive by some, income does meet criteria as a causal risk factor. The study by Costello⁵³, where longitudinal data are available and income was manipulated as a result of a casino opening, demonstrates a direct effect of income on outcome and suggests that income can meet all these criteria and does act as a causal factor for some outcomes. However, other variables also contribute to variability in outcomes, even when income is accounted for, suggesting that child mental health outcomes are a result of complex interplay among multiple factors. There are no studies demonstrating that child mental health problems act as a causal risk factor.

Issues in the identification of and definition of mental health and disorder are also important to consider in this report⁷⁹. Differences in definition of what constitutes a disorder (e.g., dimensional or categorical classification, or small changes to questions or item wording) and the length of time that behaviours must be present impact estimates of prevalence and which children are classified with disorder². Inclusion of impairment criteria, in addition to the presence of behaviour, also impacts prevalence estimates. There is no consensus on how data from multiple informants are integrated². Further, the population from which the sample is drawn is important. Finally, as children grow and develop, behavioural patterns change. Behaviours that are considered normal or delayed at one age, may be considered deviant at another. Knowledge and consideration of normal development is important in identifying children with mental health problems⁸⁰.

In addition, issues about examining the long-term effects of poverty or child and youth mental health problems on adult outcomes should be raised. The effects of long-term poverty on education and income are stronger than those noted for adult mental health. This may relate in



part to the fact that measurement of adult education and income is quite reliable, whereas the assessment of adult mental health has more error associated with it. Also, different respondents are responsible for providing assessment information on child (parent, teacher respondents) and adult (self-report) mental health information.

SUMMARY

Child and youth mental health problems are important since they are common, are associated with broad impairment lasting into adulthood for some, and have high costs to society.

There is a strong association between poverty and child and youth mental health problems. The odds of a child or youth from a poor family having a mental health problem are three times that of a child from a non-poor family. This relationship is stable and consistent across countries, measures of poverty, methods of determining diagnosis and different times.

The relationship between poverty and child and youth mental health problems holds for both family-level and neighbourhood-level poverty measures.

Childhood poverty is associated with increased mental health and other difficulties when these difficulties are measured cross-sectionally or longitudinally. The effect of family poverty in the short term, such as into adolescence, is greater on academic than psychiatric outcomes. The effect of family poverty on longer-term outcomes, such as into adulthood, is greater on physical health difficulties than mental health outcomes. The latter are more strongly associated with adult SES.

Childhood poverty is also associated with long-term adult poverty.

Studies that examine a single composite measure of child and youth mental health problems demonstrate increased prevalence of psychiatric disorders among poor children versus non-poor children. Likewise, when the measurement of psychiatric disorder is specified more precisely, almost all types of child and youth psychiatric disorders are elevated in children and youth from economically disadvantaged families whether disadvantage is measured at the family or neighbourhood level. Externalizing behaviours, such as conduct and oppositional



behaviours, are more strongly linked to low SES than internalizing (or emotional/mood/anxiety) behaviours. This has been found for both family-level and neighbourhood-level poverty measures.

The risk factors associated with increased prevalence of child and youth mental health problems are learning difficulties and irritable or difficult temperament at the child level, abusive and neglectful or harsh and inconsistent parenting, parental mental illness and substance use, teen parenthood and an unstable home environment at the family level, and inadequate access to healthcare, isolation from supportive neighbours, inadequate educational opportunities, inadequate adult supervision, and association with deviant peers at the community level. Protective factors for child and youth mental health problems are easy temperament, good learning skills, good social skills and positive beliefs about the larger world at the individual level, and support from at least one consistent care-giving adult.

Multiple risk and protective factors have cumulative effects on child outcomes (increasing and decreasing difficulties respectively).

The mechanisms through which poverty influences child and youth mental health outcomes are not well understood. Poverty may have a direct influence on child morbidity. The effect of poverty is also mediated through individual factors such as trauma, family factors such as parenting, family conflict, and parental mental health, and community factors such as level of community violence. Poverty in childhood influences adult health outcomes through a variety of family and individual factors including familial liability to ill health, child and adolescent health behaviour, childhood intelligence, and childhood abuse. Adult SES has a stronger influence than childhood SES on some adult outcomes (e.g., mood and anxiety).

Specific populations of children and youth are at higher risk of poverty and of experiencing mental health problems. These include children from single-mother families, children of teen mothers, children of social assistance recipients, youth transitioning from crown-ward status, early school leavers, and children and youth with disabilities.

Single mother status moderates the relationship between poverty and child and youth mental health outcomes, with economically disadvantaged children from single-mother families faring worse than those who are from two-parent families.

Recent immigrant status (first or second generation) moderates the relationship between poverty and child and youth mental health outcomes, with children and youth whose families were recent immigrants faring better than those who were more distant immigrants.

Participation in prevention programs can also moderate the relationship between poverty and child and youth mental health outcomes. Specific programs, such as those aimed at parenting and child skills development and when children are young, have been rigorously evaluated and have demonstrated short- and long-term benefits.



REFERENCES

- 1. Waddell, C., McEwan, K. & Shepherd, C.A. (2005). A public health strategy to improve the mental health of Canadian children. *Canadian Journal of Psychiatry*, 50, 226-233.
- 2. Boyle, M.H., & Georgiades, K. (forthcoming). Perspectives on Child Psychiatric Disorder in Canada. In: J. Cairney & D. Streiner (eds.), *Mental health in Canada: An Epidemiologic Perspective*. University of Toronto Press, Toronto.
- 3. Waddell, C., Offord, D.R., Shepherd, C.A., Hua, J.M., & McEwan, K. (2002). Child psychiatric epidemiology and Canadian public policy-making: the state of the science and the art of the possible. *Canadian Journal of Psychiatry*, 47, 825-832.
- 4. Costello, E.J., Foley, D.L., & Angold, A. (2006). 10-year research update review: the epidemiology of child and adolescent psychiatric disorders: I. Methods and public health burden. *Journal of the American Academy of Child and Adolescent Psychiatry*, 44, 972-986.
- 5. Schachter, H., Girardi, A., Gelinas, S., Wilson, A., Lacroix, D.L., Moor, C., Ly, M., Lumb, A., Van Berkom, J., & Deonandan, R. (2008). Prevalence of mental health difficulties among children and youth: a systematic review of the scientific evidence. http://www.onthepoint.ca/evidence/research.htm
- 6. National Institute of Mental Health (2001). *Blueprint for change research on child and adolescent mental health.* National Institute of Mental health; Washington, D.C.
- 7. Angold, A., & Costello, E.J. (1995). Developmental epidemiology. *Epidemiologic Reviews*, 17, 74-82.
- 8. Burke, K.C., Burke, J.D., Regier, D.A., & Rae, D.S. (1990). Age of onset of selected mental disorders in five community populations. *Archives of General Psychiatry*, 47, 511-518.
- 9. Christie, K.A., Burke, J.D. Reiger, D.A., Rae, D.S., Boyd, J.H., & Locke, B.Z. (1988). Epidemiologic evidence for early onset of mental disorders and higher risk of drug abuse in young adults. *American Journal of Psychiatry*, 145,971-975.
- 10. Cohen, M.A. (1998). The monetary value of saving a high-risk youth. *Journal of Quantitative Criminology*, 14, 5-33.
- 11. Achenbach, T.M., Dumenci, L., & Rescorla, L.A. (2003). Are American children's problems getting worse? A 23-year comparison. *Journal of Abnormal Child Psychology*, 31, 1-11.
- 12. Thomas, H., & Boyle, M.H. (2002). *Improving The Mental Health of Young Children in Toronto: Needs assessment and literature review.* City of Toronto.

- 13. Bradley, R.H., & Corwyn, R.F. (2002). Socioeconomic status and child development. *Annual Review of Psychology*, 53, 371-399.
- 14. McLoyd, V.C. (1998). Socioeconomic disadvantage and child development. *Annual Review of Psychology*, 53, 378-399.
- 15. UNICEF. (2005). Child Poverty in Rich Countries, 2005. *Innocenti Report Card* No.6. UNICEF Innocenti Research Centre, Florence.
- 16. White, K.R. (1982). The relation between socioeconomic status and academic achievement. *Psychological Bulletin*, 91, 461-481.
- 17. Pickett, K.E., Wilkinson, R.G. (2007). Child well-being and income inequality in rich societies: ecological cross sectional studies. *British Medical Journal*, 335, 1080. Epub.
- 18. Offord, D.R., Boyle, M.H., Fleming, J. E., Munroe Blum, H., & Rae Grant, N.I. (1989). Ontario Child Health Study. Summary of selected results. *Canadian Journal of Psychiatry*, 34, 483-491.
- 19. Costello, E.J., Angold, A., Burns, B.J., Stangl, D.K., Tweed, D.L., Erkanli, A., & Worthman, C.M. (1996). The Great Smoky Mountains study of youth. Goals, design, methods, and the prevalence of DSM-III-R disorders. *Archives of General Psychiatry*, 53, 1129-1136.
- 20. Meltzer, H., Gatward, R., Goodman, R., & Ford T. (2000). *Mental health of Children and Adolescents in Great Britain.* The Stationery Office; London, U.
- Goodman, R., Ford, T., Richards, H., Gatward, R., & Meltzer, H. (2000). The Development and Well-being Assessment: description and initial validation of an integrated assessment of child and adolescent psychopathology. *Journal of Child Psychology and Psychiatry*, 41, 645-655.
- 22. Sawyer, M.G., Arney, F.M., Baghurst, P.A., Clark, J.J., Graetz, B.W., Kosky, R.J., Nurcome, B., Patton, G.C., Prior, M.R., Raphael, B., Reg., J.M., Whaites, L.C., & Zubrick, S.R. (2001). The mental health of young people in Australia: key findings from the child and adolescent component of the national survey of mental earth and well-being. *Australia and New Zealand Journal of Psychiatry*, 35, 806-814.
- 23. Currie, J., & Lin, W. (2007). Chipping away at health: more on the relationship between income and child health. *Health Affairs*, 26, 331-344.
- 24. Cohen, J. (1992). A power primer. Psychological Bulletin, 112, 155-159.
- 25. Offord, D.R., & Lipman, E.L. (1996). Emotional and behavioural problems: frequency by age, gender and income level and co-occurrence with other problems. *Growing Up in Canada. National Longitudinal Survey of Children and Youth.* Human Resources Development Canada, Statistics Canada, Ottawa, Canada, Catalogue No. 89-550-MPE.

- 26. Leventhal, T., & Brooks-Gunn J. (2000). The neighbourhoods they live in: the effects of neighbourhood residence on child and adolescent outcomes. *Psychological Bulletin*, 126, 309-337.
- 27. Sampson, R.J., Raudenbush, S.W., & Earls, F. (1997). Neighbourhoods and violent crime: a multilevel study of collective efficacy. *Science*, 277, 918-924.
- 28. Boyle, M.H., & Lipman, E.L. (2002). Do places matter? Socioeconomic disadvantage and behavioural problems of children in Canada. *Journal of Consulting and Clinical Psychology*, 70, 378-389.
- 29. Xue, Y., Leventhal, T., Brooks-Gunn, J., & Earls, F.J. (2005). Neighborhood residence and mental health problems of 5 to 11 year olds. *Archives of General Psychiatry*, 62, 554-563.
- 30. Offord, D.R., Boyle, M.H., Racine, Y.A., Fleming, J.E., Cadman, D.T., Munroe Blum, H., Byrne, C., Links, P., Lipman, E.L., MacMillan, H.L., Rae Grant, N.I., Sanford, M.N., Szatmari, P., Thomas H., & Woodward, C.A. (1992). Outcome, prognosis, and risk in a longitudinal follow-up study. *Journal of the American Academy of Child and Adolescent Psychiatry*, 31, 916-923.
- 31. Lipman, E.L., & Offord, D.R. (1997). Psychosocial morbidity among poor children in Ontario. In: G. Duncan & J. Brooks-Gunn (eds.), *Consequences of Growing Up Poor*. Russell Sage Foundation, New York, pp. 239-287.
- 32. Duncan, G., & Brooks-Gunn, J. (1997). Income effects across the lifespan: integration and interpretation. In: G. Duncan & J. Brooks-Gunn (eds.), *Consequences of Growing Up Poor.* Russell Sage Foundation, New York, pp. 596-610.
- 33. Duncan, G., Brooks-Gunn, J., & Klebanov, P.K. (1994). Economic deprivation and early child development. *Child Development*, 65, 296-318.
- 34. McLeod, J.D., & Shanahan, M.J. (1993). Poverty, parenting, and children's mental health. *American Sociological Review*, 58, 351-366.
- 35. McLeod, J.D., & Shanahan, M.J. (1996). Trajectories of poverty and children's mental health. *Journal of Health and Social Behavior*, 37, 207-220.
- 36. Poulton, R., Caspi, A., Milne, B.J., Thomas, W.M., Taylor, A., Sears, M.R., & Moffitt, T.E. (2002). Association between children's experience of socioeconomic disadvantage and adult health: a life-course study. *The Lancet*, 360, 1640-1645.
- 37. Galobardes, B., Smith, G.D., & Lynch, J. W. (2006). Systematic review of the influence of childhood socioeconomic circumstances on risk for cardiovascular disease in adulthood. *Annals of Epidemiology*, 16, 91-104
- 38. Power, C. (1991). Social and economic background and class inqualities in health among young adults. *Social Science and Medicine*, 32, 411-417.

- of Control of Control
- 39. Loeber, R., & Wikstrom, P. (1993). Individual pathways to crime in different types of neighbourhoods. In: D.P. Farrington, R.J. Sampson, & P. –O.H. Wikstrom (eds.). *Integrating individual and ecological aspects of crime*. National Council for Crime Prevention: Stockholm; pp. 169-204.
- 40. Boyle, M.H., Georgiades, K., Racine, Y., & Mustard, C. (2007). Neighbourhood and family influences on educational attainment: results from the Ontario Child Health Study Follow-Up 2001. *Child Development*, 78, 168-169.
- 41. Roberts, R.E., Roberts, C.R., & Xing, Y. (2007). Rates of DSM-IV psychiatric disorders among adolescents in a large metropolitan area. *Journal of Psychiatric Research*, 41, 959-967.
- 42. Moffitt, T.E. (2005). The new look of behavioural genetics in developmental psychopathology: gene-environment interplay in antisocial behaviours. *Psychological Bulletin*, 131, 533-554.
- 43. Caspi, A., McClay, J., Moffitt, T., Mill, J., Martin, J., Craig, I.W., Taylor, A., & Poulton, R. (2002). Role of genotype in the cycle of violence in maltreated children. *Science*, 299, 851-854.
- 44. Corcoran, M., & Chaudry, A. (1997). The dynamics of childhood poverty. *The Future of Children*, 7, 40-54.
- 45. Holzer, H.J., Whitmore Schanzenbach, D. Duncan, G.J., & Ludwig, J. (2007). *The economic costs of poverty in the United States: subsequent effects of children growing up poor.* National Poverty Center Working Paper Series #07-04.
- 46. Ludwig, J., & Mayer, S. (2006). "Culture" and the intergenerational transmission of poverty: the prevention paradox. *The Future of Children*, 16, 175-196.
- 47. Schwartz, C., Waddell, C., Harrison, E., Garland, O., Nigthingale, L., & Dixon, J. (2007). Children's Mental Health Research Quarterly: Winter Issue Prevention of Mental Disorders. Vancouver, BC: Children's Health Policy Centre, Faculty of Health Sciences, Simon Fraser University.
- 48. Rutter, M., Pickles, A., Murray, R., D. & Eaves, L. (2001). Testing hypotheses on specific environmental causal effects on behaviour. *Psychological Bulletin*, 127, 29-324.
- 49. Sameroff, A.J., Seifer, R., Barocas, R., Zax, M., & Greenspan, S. (1987). Intelligence quotient scores of 4-year-old children: social-environmental risk factors. *Pediatrics*, 79, 343-350.
- 50. Larson, K., Russ, S.A., Crall, J.J., & Halfon, N. (2008). Influence of multiple social risk factors in children's health. *Pediatrics*, 121, 337-344.

- 51. Runyan, D.K., Hunter, W.M., Socolar, R.R.S., Amayan Jackson, L., English, D., Landsverk, J., Dubowitz, H., Browne, D.H., Bangdiwala, S.I., & Mathew, R.M. (1998). Children who prosper in unfavorable environments: The relationship to social capital. *Pediatrics*, 101, 12-18.
- 52. Coleman, J.S. (1988). Social capital in the creation of human capital. *American Journal of Sociology*, 94, 95-120.
- 53. Costello, E.J., Compton, S.N., Keller, G., & Angold, A. (2003) Relationships between poverty and psychopathology: a natural experiment. *Journal of The American Medical Association*, 290, 2023-2029.
- 54. Kraemer, H.C., Stice, E., Kazdin, A., Offord, D., Kupfer, D. (2001). How do risk factors work together? Mediators, moderators, and independent, overlapping and proxy risk factors. *American Journal of Psychiatry*, 158, 848-856.
- 55. Grant, K.E., McCormick, A., Poindexter, L., Simpkins, T., Janda, C.M., Thomas, K.J., Campbell, A., Carleton, R., & Taylor, J. (2005). Exposure to violence and parenting as mediators between poverty and psychological symptoms in urban African American adolescents. *Journal of Adolescence*, 28, 507-521.
- 56. McLoyd, V.C. (1990). The impact of economic hardship on black families and children: psychological distress, parenting, and socio-emotional development. *Child Development*, 61, 311-346.
- 57. Beiser, M., Hou, F., Hyman, I., & Tousignant, M. (2002). Poverty, family process and the mental health of immigrant children in Canada. *American Journal of Public Health*, 92, 220-227.
- 58. Melichior, M., Moffitt, T.E., Milne, B.J., Poulton, R., & Caspi, A. (2007). Why do children from socioeconomically disadvantaged families suffer from poor health when they reach adulthood? A life-course study. American Journal of Epidemiology, 166, 966-974.
- 59. Bures, R.M. (2003). Childhood residential stability and health at midlife. *American Journal of Public Health*, 93, 1144-1148.
- 60. Lipman, E.L., Boyle, M.H., Dooley, M.D., Offord, D.R. (2002). Child well-being in single-mother families. *Journal of the American Academy of Child and Adolescent Psychiatry*, 41, 75-82.
- 61. Lipman, E.L., Offord, D.R., & Dooley, M.D. (1996). What do we know about children from single-mother families? Questions and answers from The National Longitudinal Survey of Children and Youth. In: *Growing up in Canada: National Longitudinal Survey of children and Youth.* Catalogue No. 89-550-MPE. Human Resources Development Canada, Ottawa.
- 62. Lipman, E.L., Boyle, M.H., Georgiades K., & Racine, Y. (2008). The impact of being born to a teen mother on psychological functioning. (In preparation)



- 63. Offord, D.R., Boyle, M.H., & Jones, B.R. (1987). Psychiatric disorder and poor school performance among welfare children in Ontario. *Canadian Journal of Psychiatry*, 32, 518-525.
- 64. Georgiades, K., Boyle, M.H., & Duku, E. (2007). Contextual influences on children's mental health and school performance: the moderating effects of family immigrant status. *Child Development*, 78, 1572-1591.
- 65. Jaycox, L.H., Stein, B.D., Kataoka, S.H., Wong, M., Fink A., Escudero, P., & Zaragoza, C. (2002). Violence explosive, post traumatic stress disorder, and depressive symptoms among recent immigrant children. *Journal of the American Academy of Child and Adolescent Psychiatry*, 41, 1104-1110.
- 66. Lopez, P., & Allen, P.J. (2007). Addressing the health needs of adolescents transitioning out of foster care. *Pediatric Nursing*, 33, 345-355.
- 67. Wekerle, C., Boyle, M., Leung, E., MacMillan, H., Trocme, N., & Waechter, R. (2008). The Maltreatment and Adolescent Pathways (MAP) Study: Child welfare outcome indicators tracking, database integration, and knowledge translation. Annual Report submitted to the Ministry of Children & Youth Services: Toronto, Canada.
- 68. Wekerle, C., Leung, E., Wall, A.M., MacMillan, H., Boyle M., Trocme, N., & Waechter, R. (2008). The contribution of childhood emotional abuse to teen dating violence among child protective services involved youth. *Journal of Child Abuse and Neglect* (in press).
- 69. Tweedle, A. (2007). Youth leaving care: how do they fare? *New Directions in Youth Development*, 113, 15-31.
- 70. Child Trends Databank. (2008). Dropout Rates. www.childrentrendsdatabank.org/pdf/1 PDF.pdf
- 71. Offord, D.R., Kraemer, H.C., Kazdin, A.E., Jensen, P., & Harrington, R. Lowering the burden of suffering from child psychiatric disorder: trade-offs among clinical, targeted, and universal interventions. *Journal of the American Academy of Child Psychiatry*, 37, 686-694.
- 72. Olds, D., Henderson, C.R.Jr., Cole, R., Eckenrode, J., Kitzman, H., Luckey, D., Pettitt, L., Sidora, K., Morris, P., & Powers, J. (1998). Long term effects of nurse home visitation on children's criminal and antisocial behaviour: 15-year follow-up of a randomized controlled trial. *Journal of The American Medical Association*, 280, 1238-1244.
- 73. Schweinhart., L.J. & Weikart, D.D. (1997). *The High/Scope Preschool Curriculum Comparison Study through age* 23. Early Childhood Research Quarterly, 12, 117-143.
- 74. Conduct Problems Prevention Research Group. (2002). Evaluation of the first 3 years of the Fast Track prevention trial with children at high risk for adolescent conduct problems. *Journal of Abnormal Child Psychology*, 30, 19-35.

- Ialongo, N., Poduska, J., Werthamer, L. & Kellam, S. (2001). The distal impact of two firstgrade preventive interventions on conduct problems and disorder in early adolescence. *Journal of Emotional and Behavioural Disorders*, 9, 146-160.
- 76. Webster-Stratton, C. (2001). Preventing conduct problems, promoting social competence: A parent and teacher training partnership in Head Start. *Journal of Clinical Child Psychology*, 30, 283-302.
- 77. Nelson, G., Westhues, A., MacLeod, J. (2003). A meta-analysis is of longitudinal research on preschool prevention programs for children. *Prevention & Treatment*, 6, Article 31.
- 78. Kraemer, H.C., Kazdin, A.E, Offord, D.R., Kessler, R.C., Jensen, P.S., & Kupfer, D.J. (1997). Coming to terms with terms of risk. *Archives of General Psychiatry*, 54, 337-343.
- 79. Roberts, R.E., Attkinson, C.C., Rosenblatt, A. (1998). Prevalence of psychopathology among children and adolescents. *American Journal of Psychiatry*, 155, 715-725.
- 80. Scott, S. (2002). Classification of psychiatric disorders in children and adolescence: bullying castles in the sand. *Advances in Psychiatric Treatment*. 8, 205-213.



TABLE 1: SUMMARY OF SELECTED STUDIES

Ref. #	Author / Location	SampleSizeAgeExcludedFollowing	Poverty Measure	Disorder measure "Caseness"	Findings (F) Strengths (S) Weaknesses (W)
18	Offord et al. / Ontario, Canada	 All children living in households 2,679 4-16 years Ontario First Nation reserve or in institution 4 years 	Portion of family income in past year by social assistance	DSM-III Based on CBCL symptoms Rutter severity of impairment Judged by clinician, child, parent, teacher	F: Odds of disorder 2.8 for poor children vs. non-poor children S: General population sample Males and females Standard measure of symptoms, plus impairment Multiple informants Large sample W: Data from 1983
19	Costello et al. / North Carolina, US	 All children attending public school in 11 rural counties 1,015 9, 11, 13 years Primary language other than English or Spanish Longitudinal cohort study 	Federal poverty line	DSM-III-R Based on CAPA symptoms CAPA, CGAS, CAFAS, SIS for impairment Judged by computer algorithms, child, parent	F: Odds of disorder 3.2 for poor vs. non-poor children S: General population sample Males and females Standard measure of symptoms, plus impairment Multiple informants Large sample W: Rural only
20	Meltzer et al. / England, Scotland & Wales	 All children living in a household 10,438 5-15 years No postal code for household address 18 months 	Multiple (Unemployed, household income, parent education, social class based on occupational status)	DSM-IV, ICD-10 Based on DAWBA, SDQ symptoms and impairment Computer- assisted clinician ratings of all reports	F: Odds of disorder 2.85 for poor children vs. non-poor children S: General population sample Males and females Standard measures of symptoms, plus impairment Large sample



22	Sawyer et al. / Australia	 Children in households 4,509 4-17 years N/A N/A 	Household income	DSM-IV Based on CBCL symptoms No impairment measure Judged by computer algorithm, parent	F: Children from poor families significantly more likely to be in clinical range or just below than those from non-poor families S: General population sample Males and females Standard measure of symptoms Large sample W: No measure of impairment Parent only
23	Currie and Lin / US	 One child per household Approx. 44,000 2-17 years Child head of household, not members of primary family, not of same race as other children in household N/A 	Federal poverty line	Specific questions if child ever diagnosed with Judged by mother	F: Children from poor families significantly more likely to have mental health conditions than those from non-poor families S: General population sample Males and females Large sample W: Non-standard measure of disorder No measure of impairment Mother only
25	Offord and Lipman / Canada	 Children in household 22,831 0-11 years In institutions > six months, Aboriginal off-reserve Longitudinal 	Family income with respect to LICO	DSM-III Symptom checklist from various sources including CBCL Top 10% of ratings on behavioural scales	F: Increased rates of one or more psychiatric disorders as income decreased (4-11 years old) S: General population sample Males and females Large sample W: Non-standard measure of caseness Person most knowledgeable only No measure of impairment



2	Boyle and Georgiades / Canada	 Children in household 22,831 0-11 years In institutions > six months, Aboriginal off-reserve Longitudinal 	Family income < LICO	DSM-III	F: Mean level of emotional-behavioural ratings higher in poor families (4-11 years old) S: General population sample Males and females Large sample W: No measure of caseness Person most responsible only
29	Xue et al. / Chicago, US	 Children in randomly selected households in neighbourhoods 2,805 5-11 years None Longitudinal 	Neighbourhood SES (based on income assistance, education)	CBCL/CBCL threshold	 No measure of impairment F: Mean ratings of internalizing behaviours and scores above clinical threshold highest in low SES S: Large sample Males and females Standard measure of disorder Measurement of neighbourhood disadvantage W: No measure of caseness No measure of impairment
28	Boyle and Lipman / Canada	 Children in households 14,226 4-11 years In institutions > six months, Aboriginal off-reserve Longitudinal 	Index (based on assistance, education, income, employment)	DSM-III Symptom checklist derived from various sources including CBCL	F: 7% of variation in behavioural problems associated with neighbourhoods, reduced when parent and family variables taken into account S: Large sample Males and females Multiple informants General population sample Measurement of neighbourhood disadvantage W: No measure of caseness No measure of impairment



30, 31	Offord et al. / Ontario, Canada	 All children living in households 2,679 4-16 years First Nations reserve or in institutions 4 years 	Family income	DSM-III Based on CBCL symptoms Rutter severity criteria Judged by clinician, child, parent, teacher	F: Low family income (<\$10,000) in 1983 significantly predicted disorder in 1987 among those without disorder Low family income and income < LICO in 1983 was more predictive of academic problems than psychiatric problems S: General population sample Males and females Standard measure of symptoms, plus impairment Multiple informants Large sample W: Data from 1983
34	McLeod and Shanahan / US	 Children of mothers in national survey 1,733 4-8 years None N/A 	Current poverty indicator ≈ federal poverty status Persistence = Number of years in poverty	Maternal rating of internalizing/ externalizing symptoms	F: Persistent poverty predicts internalizing symptoms beyond current poverty Current poverty predicts externalizing symptoms S: Longitudinal measure of poverty National sample W: Oversampled disadvantaged mothers Non-standard measure of disorder No measure of caseness Maternal informant only
35	McLeod and Shanahan / US	 Children of mothers in national survey 613 4-5 years in 1986 N/A 2 years X 2 	Current poverty indicator ≈ federal poverty status Persistence = Number of years in poverty	Maternal rating of internalizing/ externalizing symptoms	F: Children with persistent poverty (1986-90) more likely to have persistent antisocial behaviour than transiently poor and non-poor children S: Longitudinal measure of poverty W: Oversampled disadvantaged mothers



36	Poulton et al. / New Zealand	 Birth cohort April 1972-March 1973 N/A 0-26 years None Longitudinal 	Childhood: Occupational status of family (average of measures at 3, 5, 7, 9, 11, 13 and 15 years) Adult: At 26 years	DSM-IV Diagnostic interview schedule Specific DSM-IV symptoms	 Non-standard measure of disorder No measure of caseness Maternal informant only Small sample E: Low childhood SES associated with poor dental and physical health Low adult SES associated with poor mental health and substance abuse S: Longitudinal measure of poverty Birth cohort W: Limited mental health
38	Power / England, Scotland and Wales	 Birth cohort March 1958 17,733 0-23 years None Longitudinal 	Occupational status at 7, 11 and 16 years	Self-rated health, malaise, psychological morbidity, short stature	F: Low SES associated with poor health, malaise, psychological morbidity and short stature at 23 years S: Longitudinal measure of poverty Birth cohort W: Non-standard measure of morbidity
29	Xue at al. / Chicago, US	 Children in randomly selected households in neighbourhoods 2,805 5-11 years None Longitudinal 	Neighbourhood SES (based on income, assistance, education)	CBCL/CBCL threshold	F: Neighbourhood SES significantly associated with increased mental health problems S: Large sample Males and females Standard measure of disorder Measurements of neighbourhood disadvantage W: Single informant No measure of impairment





40	Boyle et al. /	All children living	Neighbourhood	F:
	Ontario, Canada	in households	affluence (based on	 Neighbourhood affluence associated with
		2 ,679	income,	educational attainment
		 4-16 years 	occupation, education)	S:
		Ontario First	,	General population sample
		Nation reserve or in institution	Disadvantage (based on lone-	Large sampleLongitudinal follow up
		■ 18 years	parent housing)	Males and females



TABLE 2: INTERVENTIONS FOR AT-RISK CHILDREN (ADAPTED FROM 46)

Program / Country	Child Age (yr)	Intervention Description	Follow-up	Findings
Nurse Visitation ⁷² / U.S.	0 – 2	Individual parent training delivered by nurses in homes	15 y	Significantly reduced symptoms of conduct disorder ¹
Perry Preschool ⁷³ / U.S.	3 – 4	Group child social skills training delivered by teachers in preschools and home	23 y	Significantly reduced symptoms of conduct disorder
John Hopkins 75 / U.S.	5 – 7	Group child social skills training delivered by teachers in schools; individual parent training delivered by teachers and clinicians in schools	5 y	Significantly reduced symptoms and new cases of conduct disorder
Fast Track 74 / U.S.	6 – 7	Group child social skills training and group parent-training delivered by teachers and clinicians in schools and homes	3 y	Significantly reduced symptoms and new cases of conduct disorder

<u>Key</u>

¹Also associated with significantly fewer cases of child abuse and neglect.



APPENDIX 1: LIST OF ABBREVIATIONS

CAFAS Child and Adolescent Functional Assessment Scale

CAPA Child and Adolescent Psychiatric Assessment

CBCL Children Behaviour Checklist

CGAS Children's Global Assessment Scale

DAWBA Development and Well-Being Assessment

DSM Diagnostic and Statistical Manual

ICD International Classification of Disorder

LICO Low income cut-off

NLSCY National Longitudinal Survey of Children and Youth

OCHS Ontario Child Health Study

SDQ Strengths and Difficulties Questionnaire

SES Socioeconomic status

SIS Social Interactions Survey